

THE MISOSYS QUARTERLY

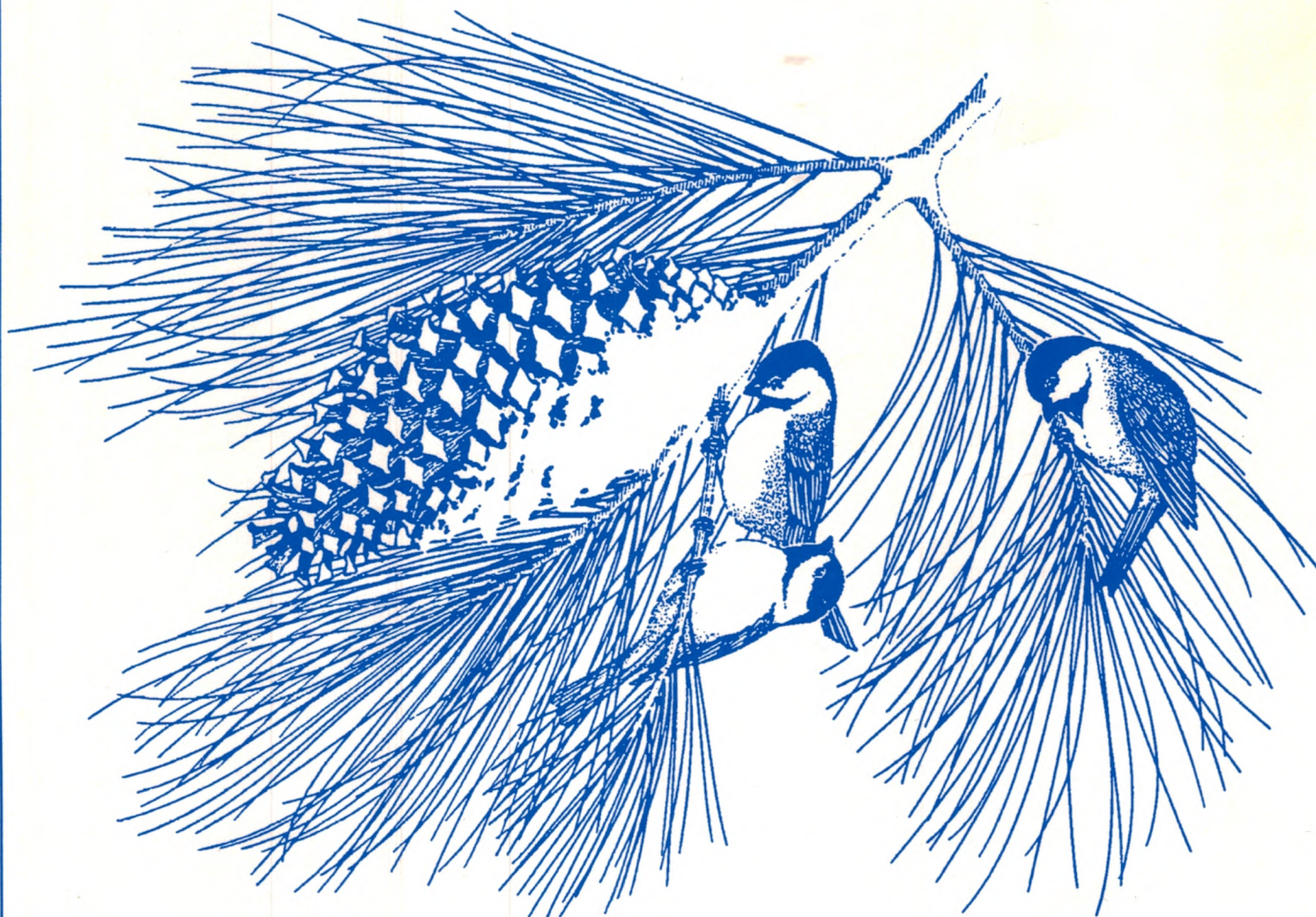
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☞ and **All the way to FIVE TWELVE K**, by Richard King

FLASH: MISOSYS acquires publishing rights to DoubleDuty

MISOSYS will be closed December 22nd until January 2nd



TRSCROSS™

(Pronounced TRISS-CROSS)

TRSCROSS runs on your PC or compatible, yet reads your TRS-80 diskettes! Copy files in either direction!

The FASTEST and EASIEST file transfer and conversion program for moving files off the TRS-80™ and over to MS-DOS (or PC-DOS) or back

TRSCROSS™
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All rights reserved

- 1 - Copy from TRS-80 diskette
- 2 - Copy to TRS-80 diskette
- 3 - Format TRS-80 diskette
- 4 - Purge TRS-80 diskette
- 5 - Display directory (PC or TRS-80)
- 6 - Exit

Shown above is the Main Menu displayed when running TRSCROSS on your PC or compatible.

TRSCROSS is as easy to use as it looks to be! The program is very straight forward, well thought out, and simple to operate. TRSCROSS has several "help" features built into the program to keep operation as easy as possible. Just pop in your TRS-80 disk to your PC and copy the files right to your PC data disk or hard disk. *It couldn't be any faster or easier!* Packed in the PowerSoft binder is a typeset instruction manual with Index. All steps are detailed. Advanced features, for those that desire to use them include executing menu options right from DOS or from a .BAT file or macro. This can really speed up transfers when similar operations are performed frequently.

TRSCROSS allows you to "TAG" all files to be moved in ONE pass!

TRSCROSS converts TRS-80 BASIC programs and SuperSCRIPSIT files in ONE PASS while COPYING to MS-DOS!

No need to save your programs or files in ASCII or run a separate conversion program first before transferring. TRSCROSS reads your tokenized BASIC program or SuperSCRIPSIT file directly off your TRS-80 disk and performs the conversion all in ONE pass while being transferred directly to your PC or compatible computer. **Automatically converts most BASIC syntax**, and lines that need special attention can be listed to a printer. (Does not convert PEEKs, POKEs, graphics, machine language calls or sub-routines.)

TRSCROSS will even FORMAT a TRS-80 disk right on your PC! (Handy for those who use both machines!) Former TRS-80 users who no longer have their TRS-80, but still have diskettes with valuable data... this is exactly what you've been waiting for!

TRSCROSS will READ FROM and COPY to the following

**TRS-80 double-density formats:
TRSDOS 1.2/1.3, TRSDOS 6.2*, LDOS 5.3*,
DOSPLUS, NEWDOS/80*, & MultiDOS.**

DOS formats listed above flagged with * signify that earlier versions of these DOS's are readable as well, but one or more sectors may be skipped due to a format problem in that version of the DOS. (Disks that were formatted with SUPER UTILITY™ or SUW4/4P™ do not have this problem.) TRSDOS 6.02.01, or higher should not have this problem. Disks formatted in any 80 track format, or single density are not supported.

TRSCROSS Requires: PC or compatible computer, 128K and a normal 360KB (40 track) PC or 1.2MB (80 track) AT drive. Double-sided operation is fully supported. If you have more than one disk drive, fixed drive, or RAM disk, operation will be much smoother. TANDY 1000 requires more than 128KB memory (DMA). TANDY 2000 is not supported at this time due to a difference in disk controller and floppy drives. "Special" data files (like PROFILE+) would need to be converted to ASCII on a TRS-80 first before they would be of use on a PC or compatible.

If you use both types of computers, or you plan to retire your TRS-80, this is for you. TRSCROSS will allow access to your TRS-80 diskettes for years to come. Copy your TRS-80 word processor data files as well as your Visicalc data files over to MS-DOS and continue using them with your new application.

Only \$89.95

Plus \$3 S&H (U.S.) or \$5 Canadian or \$12 Foreign
Virginia Residents must add appropriate sales tax.

MISOSYS, Inc.
P.O. Box 239
Sterling, VA 22170
Phone: 703-450-4181 (Orders only: 800-MISOSYS)

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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; Colombia, 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 Read-Right 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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Pacific Computer Exchange	IRC

Points to Ponder

I sometimes wonder why the "smaller" mini-floppy disk drives get referred to as 3.5 inch. The case is actually 9cm, not 3.5 inch! Ever try to find a screw that fits in a floppy mounting hole? Try 3mm, not 4-40 or 6-32! And those who say the United States is not going metric ought to begin wondering why the size of an automobile engine is now measured in liters (that's metric, folks)!

Soltoff's prediction? Before the turn of the century (that's January 1, 2001 for those who may have missed the thread a few years ago on our LDOS forum, CompuServe PCS-49), we Americans will be buying our gasoline measured in liters (or half liters) - assuming we still have any of the stuff left!

Why do I begin to get calls this time of year asking if the Quarterly is out? I know that guesstimating a three-month period takes getting used to, but this issue is on target according to my publishing schedule. Perhaps folks are just anxious to receive the good news and information crammed into each issue. I hope its not because some folks think that MISOSYS has vanished the way other companies supporting the TRS-80 may have vanished. But believe me, getting each issue of *THE MISOSYS QUARTERLY* published is taking its toll on me. Don't be surprised if the content and style change for the next issue.

As a note to folks contributing a program, please be aware that I prefer to publish WORDS along with program listings. I have received a good couple of handfuls of programs for inclusion in TMQ, but without the words describing the techniques and algorithms used, it is difficult to include. I really don't want to just publish page after page of source code. Charles Ainsworth's article in this issue is a perfect example of the kind of article I think folks want to read. So if you have some input, please consider adding some verbiage to it.

As you will discover from reading this issue, I have been a very busy beaver this year. Getting our hard drive package ready for shipping has been a monumental

The Blurb by Roy Soltoff

achievement. That did not come without cost. I have a stack of mail on my desk that will not quit. It will not all get answered. The round file has been expanded these days. Either I take up my time responding to all the input I get which would leave no time left for expansion of the products you folks keep asking for, or just busy myself with answering the mail and close up shop in six months because there are no customers left. I choose to keep expanding the product line. My solution will be to soon generate a form letter which will be sent to acknowledge receipt of mail received but to respond that there are insufficient resources to create a specific reply. Certainly I'll get to some of them.

Sure I have offended some folks. But since I can't be all things to all people, something has to give. I try to do the best job I can. But everyone in life must make some compromise. I must be doing something right, because MISOSYS is probably at this time the longest remaining surviving company still catering to the TRS-80 market. Is it either stupidity or devotion? One day I may know the answer to that question.

For now, the best place to go for support of our products is to CompuServe. Our PCS-49 forum has been supporting the TRS-80 community since CompuServe first began as MicroNet. We have some dedicated and knowledgeable folks frequenting the forum. These folks, myself included, can usually get you an answer to your question - or point you in the right direction. Look at the various topics covered in the seventeen sections in our forum.

- 0 General/NewUplds
- 1 Languages
- 2 MISOSYS Products
- 3 M1/3 Programming
- 4 Mod4 Programming
- 5 LDOS 5 Support
- 6 TRSDOS 6 Support

- 7 Applications
- 8 Hardware Hacking
- 9 MS-DOS Topics
- 10 Programmer's Jrn'l
- 11 Communications
- 15 Beta-Testing
- 16 Open Forum
- 17 Sysop Business

Can't afford CompuServe? Try some of the local bulletin boards in your area. Don't know them? Go out and buy one copy of Computer Shopper. Each issue lists the thousands of BBS's around the country. Or try a computer club. There are still clubs around the country (and around the world who have experienced TRS-80 users).

Speaking of products, for those who may have missed the news, another big reason why I'm very busy these days (and nights) at MISOSYS is that MISOSYS has made a number of acquisitions lately - all in the name of trying to ensure that for those of you out there still looking to your TRS-80 as the workhorse for computing needs, there is a resource to turn to for your hardware and software supplies.

MISOSYS is proud to announce the acquisition of Breeze/QSD's PowerSoft line of software products effective 11/1/89. Until 12/31/89, MISOSYS will be honoring PowerSoft's special summer prices as published in *The MISOSYS Quarterly*, Issue IV.i (and repeated in this issue under our banner. In addition, until 12/31/89, for every Powersoft software product purchased from MISOSYS, you can select one MISOSYS software product of equal cost or less at no additional charge. That includes such things as **Super Utility**, **TRSCROSS**, **PowerMail Plus**, **BACK-REST**, **SuperScript** printer drivers, **game disks**, and more. Check out the ads for PowerSoft products in this issue. Call or write MISOSYS for a set of brochures covering our EXTENSIVE line of software and hardware products.

Not to be content with continuing to make available just PowerSoft's great products in addition to our own extensive lineup, effective 11/01/89, MISOSYS has licensed the following powerful action games previously published by The Cornsoft Group: **Frogger (tm)**, **Scarfman**, **Bouncezoids**, **Crazy Painter**, and **Space Castle**. These are exceptional games with **great video and joystick support** (even the new MISOSYS joystick). All games are for Model III/I (or 4 in III mode). The source code of each game has been groomed to ensure compatibility with joystick operation on an XLR8er-equipped Model 4 as well as provide a normal exit to DOS. Games are available on diskette only.

Had enough of our product expansion? I'm not finished. I have been negotiating with Randy Cook for months concerning a license to publish DoubleDuty. I can now report that these negotiations have been successful and a publishing agreement is now in hand. MISOSYS is now the publisher of DoubleDuty! Our normal price is \$49.95, but to celebrate this deal, until December 31st, 1989 I will offer a Double Duty package for 25% off - just \$37.46 plus \$2 S&H (U.S.).

Finally, it is probably safe to report that for many months now I have been discussing with Tandy Merchandising, a means to ensure that all software owned by Tandy Corporation that has ever been published for the TRS-80 Models III and 4 will continue to be made available in some method of distribution. I have a verbal acknowledgement that contrary to some folks opinion of Tandy, they do listen; the wheel has been turning.

Tandy is currently developing a list of all TRS-80 software products owned by them or 100% licensed to them, as well as collecting the disk and documentation masters for those items - even products long since discontinued. Once the collection process is complete, Tandy will be able to officially activate the distribution of these products; MISOSYS will, in some capacity, be part of the retail effort to ensure that Tandy's TRS-80 software - whether currently active or discontinued - will be available for purchase to those interested in acquiring a useful product.

What does all this mean? Essentially, MISOSYS is entrenched in the process of ensuring longevity to your machine. Hardware is only useful to you as long as you have the software necessary to turn it into a productive tool. To continue along this vein, I will be continually searching out the useful and recreational products of companies who have vacated the TRS-80 scene and taken the legal distribution of those products with them. Most companies have folded making it difficult to root out the ownership and source to these products. For this I look to TMQ readers who may know of the whereabouts of entities such as Victor Andrews of Soft Sector Marketing, Bill Hogue of Big Five software, and others. Know a source, drop me a line.

p.s. I'm still accepting your favorite recipe for future TMQ's (see *Letters to the Editor*).

Note on Holiday Schedule

MISOSYS is a small shop and family oriented. Our "regulars" know that. We close up shop here during the festive time around Christmas, Chanukah, and New Year's - the '80s will be over folks, we're moving into the last decade of this century!

This year the Soltoff's will be getting together with family down at Lake Placid in Florida. As such, MISOSYS will be closed from noon on Friday December 22nd until 9:00 a.m. Tuesday January 2nd, 1990. We wish everyone a safe and pleasant year-end.

Late Breaking Patch

Roger Alcantara brought to my attention a problem with LDOS 5.3. Seems that using the ATTRIB command to LOCK or UNLOCK the passwords on a disk causes the dates to be changed. The astute will know why that happened and what was overlooked by me when 5.3 was created. What I want to know is why has that particular bug gone undiscovered since

January 1987 until this September?

```
. SYS7I/FIX - Patch to LDOS 5.3
. Corrects ATTRIB (LOCK|UNLOCK)
. Apply via PATCH SYS7/
SYS.SYSTEM SYS7I
DLE,03=00 00 00 00
FILE,03=2C 73 2C 72
. Eop
```

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

Our 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. That puts this issue on target!

Note that your mailing label usually has the expiration date of your subscription. For instance, those with "90/02" 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 sub-

scribers are predominantly in the United States; however, we do have a significant number in Canada, Europe, and Australia.

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 would have been the last page of this issue had I received any Marketplace ads. 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.

Subscribers, please mention TMQ when you call or write to these advertisers (I know, there's fewer these days); they deserve your support.

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
USA

Note that if you upload a "public domain" file to our Compuserve forum [PCS-49], and want it to receive general distribution, please also mail a copy on disk to Vic. There is no legal provision for downloading files from Compuserve and redistributing them. Some of our readers who do not have access to our forum have an interest in those submissions. So if you want to help out the most numbers of

fellow users, don't limit your submissions to just one source.

DISK NOTES 4.2

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 4.2 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. Note that I have also placed on this disk any assembler source code file associated with the patches presented in Richard King's article appearing in *The Hardware Corner*.

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 4.2 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 of Volume I and Volume II. 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 pub-

lishing 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.

III.iv Checking for a file from Model 4 BASIC; Surviving the Hard Disk crash; An "interview" with Niklaus Wirth; Keep your printer clean and oiled; On-line HELP with PRO-WAM; MISOSYS announces availability of Hard Drives; Logic in the C language.

IV.i Cataloging files with a word processor; Page display PRO-WAM application; File undating with FUNDATE; Array load routine for BASIC; XLR8er and the GT-180 graphics board.

MISOSYS Hard Drive

Since September, MISOSYS has been shipping its long awaited hard drive package with Hardware real time clock and joystick options. Details on this package and its various options were printed in TMQ 4.1; specific information is available on request.

DRAM and PALs

DRAM prices have bottomed out. Because I now keep a supply of 256K-150ns DRAMs on hand for our XLR8er board, and 64K-150ns DRAMs for motherboard replacement, I'm making these chips available for separate purchase. Note that we generally stock DRAM "Pulls"; chips used previously in sockets but pulled, refurbished, and tested. All DRAMs are 100% tested again by us before shipping. In addition, MISOSYS has acquired a BP Microsystems Logic Programmer to program the Programmable Logic Device (PLD) for our SCSI host adaptor. As this piece of hardware can also handle a wide assortment of PALs and PLDs, I can be a source for the memory expansion PAL (U72) needed to upgrade a 64K 26-1069 Model 4 to 128K. Prices as follows:

64K-15 DRAM @ \$2/chip
 256K-15 DRAM @ \$4/chip
 U72 PAL16L8-25CN @ \$8/chip

XLR8er Update

Do to continued downward pressure on DRAM pricing, I have again lowered the price of the XLR8er board with 256K of RAM by \$18. The new prices are as follows:

XLR8er with 0K RAM is \$150 + S&H
 XLR8er with 256K RAM is **\$182 + S&H**

Ribbon Cable Assemblies

MISOSYS has also acquired a Cirris Systems cable tester. This interesting piece of equipment performs a 100% test for shorts and opens on cables. It handles many different kinds of connectors based on switchable test assemblies. I have acquired an assortment of test assemblies to support the kinds of connectors typically associated with the TRS-80 micro-computer. Thus, I'm custom fabricating low-volumes of cables according to specifications, as well as providing standard replacement cables for your needs. These are all using unshielded ribbon cable. I can provide cables using DB-25 M/F, 34-pin edgcard M/F, 36-pin printer, 50-pin edgcard F, 50-pin SCSI M/F, 34-pin Header M/F, as well as DB9 Male. Need a replacement RS232 or printer cable? Probably about \$10-\$15. Note that I have 34-pin male edgcard connectors in stock. These are the ones previously known as the "Kel Am" connector", now manufactured by PCD.

Other Items

Many other products new to MISOSYS are now available. Please check other areas of this TMQ issue for announcements and particulars.

The family corner

Since I did print some scanned pictures of Stacey, Stefanie, and Benjamin in the last issue, I have had a few requests for a picture of me and Brenda. Suffice it to say that I have been given the order that we're getting a family picture this year. I need an advance warning to allow me time to schedule a haircut. My head is slowly migrating to a Yul Brynner, so I spend less time at the barber shop these days. But you folks are off the hook for now, because the photo sitting won't occur for at least a few more weeks. That means I should be able to get a family photo into the next issue, for those anxious soles out there wondering what the other end of the horn looks like.

Anyway, I'm pooped out pushing to get this issue out so I'll probably be a little brief; Guess I'm trying to do too many things at once. One of these days I'll have to give this column over to Brenda.

My mom's husband, Marty, passed away in October. So with Brenda's grandfather leaving us in August, and Marty in October, it hasn't been a fun period of time. I did get Stacey's room painted, and Stefanie's swordfish had lots of babies, so there are some bright moments.

We now have in our possession, wallpaper and trim paint for the first floor powder room. Guess what my next job is as soon as TMQ gets out of here? The room will get done in time for our December neighborhood party! I think I will be pretty busy over Thanksgiving.

It's been amazing to see how much skill in printing and reading Stacey has acquired in the past few months. She's really learned to adapt to first grade quite successfully. Of course Brenda and I are both convinced that Stacey is a Southpaw - the only one in our immediate family of five. It's funny that when I was growing up, I never knew any lefty in my family - and I had lots of aunts, uncles, and cousins (my mom was one of a dozen and my dad was one of eight). We've noticed for years now that Stacey never favored one hand over another. But the die is cast, now. She's definitely left handed. Because of this, I seem to be more attune to left

handedness than before.

Here's an offer. Since Stacey at six is now at an age where she can read and write, perhaps it would be interesting for her to get some "pen pals". If any of you have a six or seven year old who may enjoy corresponding with Stacey, why not have him or her drop a line; nothing fancy now, just pencil or pen on plain old paper. Might be kind of interesting. Your child can write to Stacey at:

**1 Tyler Lane
 Sterling, VA 22170
 USA**

Stefanie has developed an extraordinary togetherness with Benjamin. Talk about sibling anti-rivalry. They really enjoy playing together. I haven't decided whether she plays with him as if he's a "live" doll or a playmate, but they sure have fun romping around - and he's only 17 months old.

Stefanie has accepted kindergarten quite well considering she was the one who appeared more "clingy". But then everyone grows up in their own way. I still wonder when kids start learning to pick up their things.

We have started assigning little jobs to the kids. Stacey's job is to bring in the newspaper in the morning. Stefanie's job is to bring the mail in from the mailbox when she comes home from school. She also has the job of bringing to the table sodas from the refrigerator we keep out in the laundry room. But Benjamin, who has not been assigned a job, seems to be pushing to take that job from Stefanie.

Benjamin has just been a dream. We couldn't ask for a better boy. You should have seen him on Halloween. It took him but a few houses to understand that the candy was his (one neighbor did bake some oatmeal raisin cookies for the tots and specially packaged two big cookies in a bag with each tot's name). He wanted to hold the plastic pumpkin used to collect his "horde". In fact, it was a road to hoe to get him to put the loot into the pumpkin. He was dressed up like Big Bird.

Until next time...

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

Now available exclusively from MISOSYS!

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 definable 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 niceties 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 builtin 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

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 10 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

These hard disk drivers out-perform 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/L) 5 Star mailing list-data system! **\$34.95**

> Original 1986 price: \$99.95

This program was because all the other mailing list/data base systems couldn't keep track of all the types of data most folks wanted to keep track of. You needed speed, you needed hard drive support, and you 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-definable "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 definable report generating from your PowerMail+ data.

PowerSCRIPT - A Major Enhancement for SCRIPSIT 4, III and I (not SuperScriptsit)

\$24.95

> Original 1986 price: \$39.95

One of PowerSoft's 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 configurable 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 type 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 area 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 SuperScriptsit.

This is a replacement driver for the ones you got with SuperScriptsit. 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 Christopherson wrote the very first animated game for the TRS-80 and the country went wild for it. Android Nim will make everyone laugh to watch these life-like creatures as they shake their heads up and down or side to side and blink at you stupidly as they wait 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.

LANCEMICKLUS' 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.

MISOSYS, Inc.

P. O. Box 239

Sterling, VA 22170-0239

703-450-4181 (Orders only to 800-MISOSYS [647-6797])

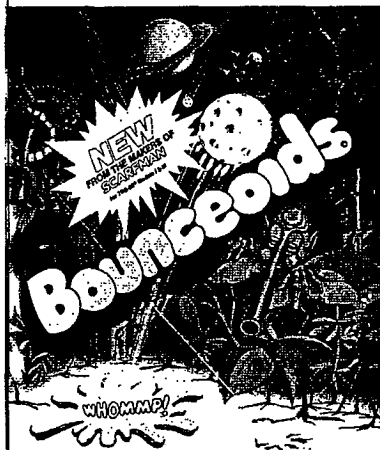
Please include \$2 S&H per program package in US; Canada is US\$1; Foreign is US\$3. COD (cash/money order) is \$3 additional.

Virginia residents add 4.5% sales tax, VISA/MC accepted.

BONANZA SPECIAL UNTIL 12/31/89: For every PowerSoft software product you purchase from MISOSYS, take any MISOSYS software product of equal or less value FREE.

The Cornsoft Group's arcade-type games Now available exclusively from MISOSYS

Great Bouncing Boulders, It's ...



BOUNCEOIDS

Where do they come from? What do they mean? You'll leave those questions to the scientists. Your duty is clear: DESTROY! Utilizing your newly issued class 4 annihilator, you must reduce the massive BOUNCEOID BOULDERS to cosmic dust! BEWARE! They bounce off of walls like giant pool balls, and the smallest touch means instant death! And as an added complication, terrible shaking bugs come slithering out of null space to crunch you into bug lunch! If you can prove yourself worthy, you will be challenged by the mysterious alien invaders in a nerve grinding test of incredible coordination and targeting skills. Will you survive?

Crazy Painter

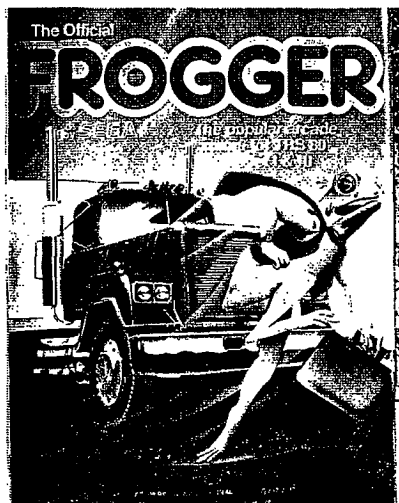


Become a "Crazy Painter" and create a masterpiece

...if you can

A mischievous puppy, snakes and poisonous turpentine buckets force changes in your painting. In higher skill levels, "paint eaters" start chewing up your work. Suddenly, everyone's a critic. Can you overcome them? And on top of it all, in the Exclusive Challenge Mode, you have to catch an army of runaway puppies. Crazy Painter is joystick compatible.

The Official FROGGER™

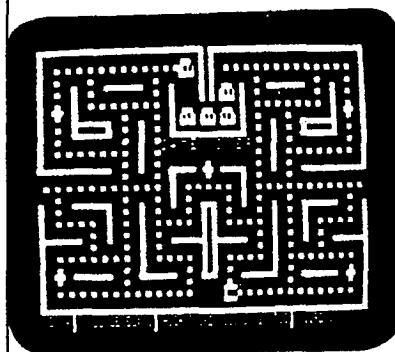


by SEGA

The popular arcade game for TRS-80 Models I & III.

SCARFMAN

*Will you SCARF your way to victory?
Can you avoid the MONSTERS that guard the maze?*



Answers to these questions await the brave, who dare to enter the maze where the monsters live. SCARFMAN, written by the author of MISSILE ATTACK, features quality GRAPHICS, SOUND, REAL TIME MONSTERS, and hours of ENJOYMENT. Nine progressive skill levels make the game more difficult as you get better. Do you have what it takes to reach skill level 9?

MISOSYS has licensed the powerful action games previously published by The Cornsoft Group: Frogger™, Scarfman, Bounceoids, Crazy Painter, and Space Castle are exceptional action games with great video and Alpha joystick support (even the new MISOSYS joystick). All games are for Model III/I (or 4 in III mode). Each is priced at \$14.95; Buy any two and take 15% off. Buy all five and take 30% off. Add \$2 for S&H in U.S.; Canada = U.S. + \$1; Foreign U.S. *3.

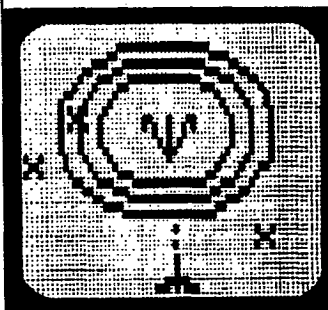
MISOSYS, Inc.

P.O. Box 239

Sterling, VA 22170-0239

703-450-4181 or 800-MISOSYS

SPACE CASTLE



Will you save the Andromeda Galaxy by destroying the Space Castle or will the evil warlord Yugdab continue to rule, uncontested? Locked in battle with Yugdab, your main defense is your ability to skillfully handle your ship and its projectiles. If you are not careful, Yugdab's intelligent mines will hunt you down and blow you into space dust. Space Castle has fast action and exciting sound.

Letters to the Editor

FOOD

Fm MISOSYS, Inc: Due to the heightened interest in food of late (on the forum), I thought it would be appropriate to request favorite recipes for publishing in TMQ. Sounded like a good set of data for the winter issue.

What follows are the few I received from interested forumites. Enjoy! By the way, the only one tested here at MISOSYS is "my" crumb cake recipe, and the hot buttered rum.

Egg custard:

Fm Jim Beard 71675,566: Ingredients: 4 eggs, 1 qt milk, 1 cup sugar, 2 tbsps vanilla extract, 1/4 tsp salt. Optional—1 oz dark Puerto Rican rum, 1 oz dark Hershey's cooking chocolate; use two more eggs for firmer custard

Scald the milk in a double boiler (do NOT boil). As it heats, grate the chocolate into the milk and dissolve. Beat together the other ingredients separately. Pour in the scalded milk and beat until thoroughly mixed. Bake at 350 degrees for 45 minutes in a 1.5 quart baking dish. Watch carefully and do NOT overcook; custard is done when a straw is inserted and comes out clean.

Fm Bob Haynes: Sounds neat! Option: add cooked rice or stale bread crust to taste. One suggestion: put the baking dish into a larger, deeper dish or pan filled with boiling water (controls the cooking temp

and prevents burning/separating).

Now I'm embarrassed: you aren't James Beard the famous chef are ya?

Fm Gary Phillips: Jim, try a microwave to cook the custard. It gets done more quickly and no danger of scorching or overcooking.



STOVETOP CHICKEN

Fm Bob Haynes 73075,77: Ingredients: Skinless boneless whole chicken breasts; 1/4 Large white Spanish Onion; Fresh broccoli spears; Fresh carrots; Casserole egg noodles; Dry vermouth, white wine or chicken broth; Salt/Pepper/Sage (or Bell's poultry seasoning); Soy sauce; Butter/margarine; Cranberry sauce

Thoroughly clean chicken and pat dry, season with sage/salt/pepper. Clean and prepare vegetables into 1" chunks, pre-steam or boil carrots until slightly underdone (still a bit crunchy). In large covered skillet, melt 2 tbsps butter, 1/2 cup liquid, and soy sauce, add sliced onion, simmer 2-5 mins (till translucent). Add layer of carrots, then broccoli, then chicken on top. (If you like your broccoli firm, add it 2-3 minutes later instead) Cover, simmer 10-15 min at medium heat. Have noodles or pasta (your choice) boiling merrily on another burner. Drain when done, optionally toss with pat of butter.

Remove chicken (don't overcook, it'll toughen), separate from veggies, and the onions will be liquified by this time which gives you a tasty sauce base. Optionally add a bit of cornstarch and cook to thicken, add more liquid to taste (be sure to cook out the alcohol!) Serve on steaming hot plates, dressing the noodles with sauce.

Adjust quantities to suit 1-4 persons.

Slinkman's Stroganoff

Fm Frank Slinkman 72411,650: Take 1 lb. top round steak (partially thawed for ease of slicing) and cut into thin strips. Chop 1/2 of a medium onion medium fine.

Brown meat and onion together, then drain. Add 1 4-oz. can of sliced mushroom tops, 4 tsp of Guilden's mustard, 1/2 tsp salt & 1/4 tsp black pepper. Cook until meat is done. Add 1 cup sour cream, mix thoroughly until entire mess is hot. Serve over wide egg noodles (optionally buttered) and you have Slinkman's Stroganoff.

Creamed spinach is an excellent "side" to this.

Hot Buttered Rum

Fm MISOSYS, Inc: This recipe for Hot Buttered Rum was given to me by my old friend, Ray Ridgeway. It was a favorite on the many parties commemorating the upteenth anniversary of his 29th birthday, as well as his annual Christmas party. It's great for those cold winter nights. Don't skimp on the ingredients; and no substitutes, please. Dieters stay away!

Ingredients: 1 pound of butter, softened; 1 quart of French Vanilla ice cream; 1 pound of dark brown sugar; 1 pound of powdered sugar; 2 teaspoons of ground nutmeg; 2 teaspoons of cinnamon; Myers dark rum; cinnamon sticks; whipping cream, as desired.

In a large bowl, let the ice cream sit at room temperature until soft. Mix together with softened butter (a blender or good power mixer works well). Mix in sugar and spices. Blend until smooth then freeze in an airtight container (mixture will remain spoonable). Can be kept for months.

To serve, spoon three teaspoons of mixture (I prefer heaping) into a mug; add one jigger of rum and six ounces of boiling water. A cinnamon stick may be used as a stir stick. Top with a dollop of whipped cream.

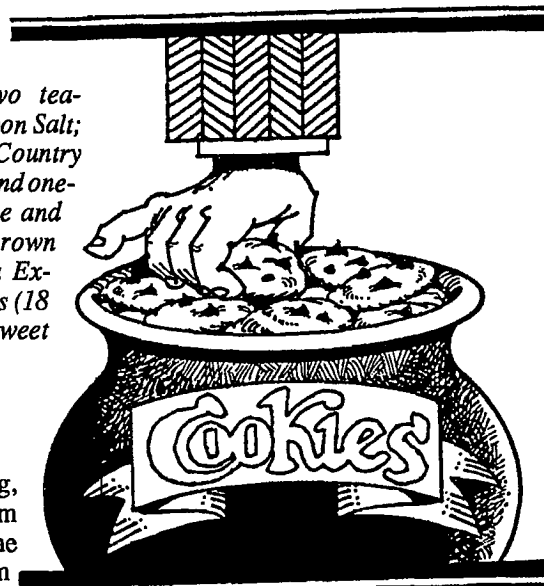
Joe Kyle-DiPietropaolo's Famous Double-Batch and Split the Difference Yankee Kentucky Windage Chocolate Chip Cookies

Ingredients: Four and one-quarter cups All-Purpose Flour; Two teaspoons Baking Soda; One teaspoon Salt; Two cups (one lb.) Land O' Lakes Country Morning Blend Margarine; One and one-half cups Granulated Sugar; One and one-half cups Firmly packed Brown Sugar; Three teaspoons Vanilla Extract; Four each Eggs; Three cups (18 oz.) Nestle Toll House Semi-sweet Chocolate Morsels.

One-half hour prior to starting, remove the eggs and margarine from the 'fridge to soften the margarine and allow the eggs to reach room temperature. Do not substitute regular butter or margarine or shortening for the Land O'Lakes Country Morning Blend. If this is not available in your area, substitute only half butter and half margarine (two sticks each).

Preheat oven to three hundred and fifty degrees. In bowl, combine flour, baking soda and salt. In large bowl, combine sugar, brown sugar and vanilla extract, then cream in margarine until very smooth. Add eggs. Gradually add flour mixture, stir until well mixed after each addition. Dough should be smooth and firm, but not stiff. Stir in chocolate morsels. Drop by heaping tablespoons onto ungreased cookie sheet, flatten dough slightly.

Cookies should bake to a pale golden brown in fifteen minutes. If they cook faster or slower, adjust oven temperature to correct cooking time to fifteen minutes. Makes about seven dozen four inch cookies. Serve warm from the oven with fresh, ice-cold milk or Diet Coke.



Middle Street Crumb Cake

Fm MISOSYS, Inc: I cannot tell a lie; this recipe is from *Bon Appetit*, April 1988. But the Soltoff household loves it. Typical Sunday morning fare.

Ingredients: 1-1/2 cups all purpose flour; 1 cup sugar; 1 tablespoon baking powder; 1/2 cup vegetable oil; 1/4 cup milk; 2 large eggs, beaten to blend; 1/3 cup firmly packed brown sugar; 2 teaspoons cinnamon; 3 tablespoons unsalted butter, cut into 9 pieces

Preheat oven to 300 F. Mix first 3 ingredients in large bowl. Add oil, milk, and eggs, and stir until moistened (do not over stir). Transfer batter to ungreased 8-inch square baking pan. Sprinkle with brown sugar, then cinnamon. Dot top with butter. Bake until tester inserted in center comes out clean, about 50 minutes. Cool slightly. Cut into squares to serve.

Hard drive queries

Hard Drive's Joystick

Fm Jim Beard: Roy, Other than games such as "13 Ghosts", what applications use the joystick?

Fm MISOSYS, Inc: I implemented a keyboard filter so that the joystick generates 5 keystrokes (one for each of 4 positions and 1 for the fire button). The "keys" default to the four arrow keys and the ENTER key. They are user configurable.

I also added a provision to dynamically switch the repeat rate as a user special entry. The joystick I'm providing has a blocking lever for 4 or 8 position. The 8 position movement activates two switches at once. So I use a corner toggle with FIRE to increase the repeat rate while the opposite corner decrements the rate over a range of 0-9. Any program which uses ARROW keys (such as an editor), can be useful to work with the joystick with no re-programming required. It's a little fun with SAID, but typically, the joystick will be targeted for GAMES. The clock works great!

Fm Jim Beard: Roy, It does sound like the joystick can be used as a mini-mouse with some software, particularly the screen draw programs. If the fire button can be mapped to the space bar in hardware, it would be a killer with 13 Ghosts.

SmartWatch tends to be a little inaccurate, as clocks go. I'm looking forward to a MISOSYS clock for my 4P.

Fm MISOSYS, Inc: Why should the Smartwatch be inaccurate? The software interface may just read the clock on boot and then rely on the RTC timer. Actually, that's the best way to do it since clock

access just slows the computer down more. On the other hand, I'm going to do it that way as well, but add a patch to the DOS @CLOSE routine so that the time is updated on every file close. I doubt that anyone will ever see the small time taken up for that!

The FIRE button, as well as any of the 4 stick positions can be dynamically changed after the filter is installed. I'm including a SETJS utility, which can change any of the 5 key codes generated as well as alter the repeat time interval.

Fm Jim Beard: Roy, Pete put his finger on it. The clock in the chip tends to lose time, particularly in unheated rooms in the wintertime. It's apparently the price of the very low cost and extreme compactness of the chip. Given a choice, I would pay another \$5 for a better XTAL or CMOS chip, or replace a battery every year. One of the things I am looking forward to in your HD clock is a higher quality crystal/chip.

Hard disk parts?

Fm Michael Strait: Roy, I hear that your Model IV hard disk upgrade has been available for a while now, I have a hard disk in my machine but am using an 8X300 controller board, I am wondering what controller is in your hard disk kit (hopefully WD-1010 or similar) and if it is available separately and how much it would cost.

Fm MISOSYS, Inc: I'm using a Xebec 1421 controller and a proprietary (read as own design) host adaptor. I have not priced them separately yet, but will soon. The host adaptor will be approximately \$75 with software. Controllers will be in the

neighborhood of \$100 (probably under, not over).

I also have Adaptec 4010A controllers and a few handfuls of Xebec 1410s.

Fm Joe Kyle-DiPietropaolo: Michael, The controller and host adapter Roy is using is not directly compatible with the Radio Shack compatible drivers, but Roy has the proper drivers available. The controller is 5.25" drive form-factor, and the required host adapter is quite small, all in all much smaller than your old 8X300 controller (which has an 8" drive form-factor). If you want a real Western Digital controller that is compatible with the RSFORM6 and RSHARD6 programs, you could order a replacement WD1010 controller from Radio Shack National Parts (817) 870-5662 as a repair part for a 26-4155W (W-series 15 Meg HD). This is a software-compatible 5.25" drive form factor controller. I expect it will be very expensive.

Mixing drive bubbles?

Fm Kevin R. Parris: I have a Tandon TM-502 ten-meg drive, currently connected to a not-working controller and interface for a TRS-80 Model 4. I also have a Seagate ST-225 twenty-meg drive, out of a pc-clone. Would it work if I ordered your host adapter and controller for a Model 4/p to connect both of these drives to a single system?

Fm MISOSYS, Inc: With our controller and host adaptor, you could connect both of those drives. I'm using an auto-configurable controller. Thus, it's easy to interface two dissimilar drives.

Fm Kevin R. Parris: I have asked you about this before, but I want to phrase it differently to be sure you really are answering exactly what it is I want to know. Can I use your host adapter and hard drive controller to connect a Tandon TM502 ten-meg drive, and a Seagate ST225 drive, to a Model 4/p computer AT the SAME TIME?, and have it operate as a combined thirty-meg configuration, for both LDOS and LS-DOS (alternately)?

Thanks for all your fine products and support!

Fm MISOSYS, Inc: Yes you can have both connected at the same time. The controller supports automatic configuration on power up as the characteristics of the drive is stored on the drive at format time. Therefore, both drives can be dissimilar as far as characteristics go.

My previous type of SASI driver - for VRDATA drives and Lobo drives - required that both drives, if 2 were used, had to be of the same characteristics. That was because I didn't want to initialize the controller every time I/O was switched from one drive to the other. I am taking advantage of the auto-init on the Xebec S1420 and Adaptec 4000A controllers - both of which we have in stock.

Fm Kevin R. Parris: TMQ Received today in Columbia, SC. Also, I note in your subscription rates categories that group "C" includes 'Columbia' along with Venezuela. I suspect you intend the South American country of 'Colombia' (with an OH instead of a U).

I may be wanting to order your host adapter and a controller, to use with hard drives I already have, for a 4/p computer. I have not yet read the new TMQ, so I apologize if this information is in there, but what would the price be for those two items?

Fm MISOSYS, Inc: I thought I copied that info from the Postal regs. Perhaps I used my noodle. Let me check that out

and correct that. Fortunately, I currently have no class C subscribers to TMQ.

Here's individual prices as just announced to folks making a specific inquiry:

ST225 drive - \$225
ST251-1 drive - \$375
Leadman case e/w 60wt p/s - \$125
MISOSYS SCSI host adaptor - \$75
Xebec 1421 controller \$95
Adaptec 4010 controller - \$95
drive power Y-cable - \$5
XT drive cable set - \$5

Note: H/A-HDC cable provided when ordering both boards; XT cable set provided when ordering both boards (header connector to edgecard connector as needed for all standard PCXT machines and the Xebec 1421 HDC.

Shipping charges additional. Optional hardware clock and joystick as previously advertised. Note that the host adaptor comes with the MSCSI software which supports both the Xebec 1421 (enhanced ROM) and Adaptec 4000/4010. Some day I'll have a M1410 software supported for the generic Xebec 1410 HDC, but it is not available at this time.

It's SYSGEN (DRIVE=d) for LS-DOS

Fm Mike Harrow: Great work on the Hard Drive Roy - The installation was a snap. I've now got LS-DOS 6.3 and LDOS 5.3 installed on the Drive.

Noticed small typo in HD20INIT and HD40INIT/JCL (LS-Dos 6.3 versions) the command that was flashed on the screen to sysgen was:

SYSGEN,DRIVE=4

Since my brain was off at the time I entered that command verbatim. Then tried to boot up and no HD. Read the

MSCSI documentation (page 25) and immediately realized my error. For those people like myself who occasionally have their brain in automatic the command should be:

SYSGEN (DRIVE=4)

More than likely you noticed this typo the day after shipping eh!

Fm MISOSYS, Inc: Actually, I noticed it after the first call. The Model 4 JCL's were upgraded from an earlier inhouse version after the Model III JCL's were finalized. Note that in LDOS 5.3, the command would have been

SYSTEM (SYSGEN,DRIVE=4)

The Model 4 JCL was edited with text inserted from the Model III version. That's why that error crept in there. It will soon be corrected on the master disks.

I'm waiting for input from folks who opted for the clock (most of them) to see what they think of the alarm. That was really a last minute addition. I had not known about the alarm function of the module as the clock chip was chosen by the engineering company. Once I knew about it, I really didn't give it much thought as to usability in the TRS-80 environment.

One day I was talking to Bill S. and mentioned it to him. He suggested that I make it available. So between the prototype PCB and the final board, I asked the engineering company to give me some additional (untested) circuitry for the alarm. They added a 7406 to tie the alarm interrupt of the clock to the external interrupt on the bus. I could not even test it until I got boards back from the PCB house (I could have hacked up one of the prototypes to do that, but chose not to). As it was, the decision was to use it if it worked, and not use it if it didn't. It worked. So it was really a late addition to the software development adding ALARM program and interrupt task. Kind of neat, I think.

Somewhere down the road, I may investigate altering the task processor of the

DOS to be able to switch states on a particular interrupt. That way, a mas-
kable external interrupt could switch
programs. That would be a method of
popping up a window when the alarm
went off.

Fm Mike Harrow: I noticed the similar-
ity in the /JCL files and suspected some-
thing like that had happened. Sounds like
you're just a little bit over-worked there.

The Alarm is a nice feature and the addi-
tional RAM has me interested too. I tried
out the alarm and it executed just as
documented.

The DS1287 interrupts at specifically timed
intervals independent of CPU clock speed
is another feature worthy of investigation.

There is one complaint (suggestion) why
isn't there a nice "MISOSYS, Inc." logo
on the front of the Leadman case.

Fm MISOSYS, Inc: For the "small"
quantity of expected sales, I couldn't justify
such a label.

Z-80 Lives!

Fm Joe Kyle-DiPietropaolo: This just
came off UseNet, I thought it might be
appreciated here. Cheers.

With apologies to Bob Seager and "Give
me that old-time rock and roll."

*Just take those old 8-bitters off the
shelf.*

*I'll stay and code on them all by myself.
Today's chips just can't put up a fight
to that old time z-80's height.*

(chorus:)

Give me that old time Z-80.

*That funky chip it just fills you with
glee.*

*Them new procs with all their thirty-two
bits*

so complicated give you terrible fits.

*Don't try to tell me 'bout your RISC-Os.
You'll never even get my cross-com-
piled code.*

*Today's processors are just so over-
blown,*

*They fail more often, users grumble and
groan.*

(chorus)

Correction to FUNDATE/ ASM

Fm Adam Rubin: I have a short question
about the FUNDATE/ASM program in
the latest (IV.i) TMQ. In the section at the
bottom of page 51, after the label FUN-
DAT1, you check the access level of the
file with LD A,(HL). As I understand it,
on entry to FUNDAT1, HL is pointing to
the filespec in the command line, and the
calls to @FSPEC, @FLAGS, and @OPEN
don't alter HL. When the LD A,(HL) is
done, isn't HL still pointing to the file-
spec in the command line? I thought the
access level for the file would be in
(FCBFIL+1). Am I coming to the wrong
conclusion here?

Fm MISOSYS, Inc: You're coming to
the correct conclusion. My head must
have been elsewhere. Good reason for not
getting any access violation errors. I will
have to publish a correction.

Fm Adam Rubin: Roy, I can guess what
you were thinking of... the same code
appears in 6.2/6.3's RESET command
("Source" v2 p339 bottom). I asked Virgil
(LSI) about RESET a while back, and got

a song-and-dance. Your straightforward
answer is VERY much appreciated, as I
was getting pretty confused about the
whole thing.

Fm MISOSYS, Inc: That's probably where
I grabbed the code from! If I had known
about that report, a second mistake would
not have been made.

Here's the correction. Starting from the
code following the "update the extended
date/time" comment:

Old code:

```
@@FLAGS
SET      0, (IY+'S'-'A')
@@OPEN
RET      NZ
LD       A, (HL)
AND      7
CP       5
```

Replacement Code:

```
@@FLAGS
SET      0, (IY+'S'-'A')
@@OPEN
RET      NZ
INC      DE
;Point to FCB+1
LD       A, (DE) ;P/u
privileges
AND      7
CP       5
```

Note that Disk Notes 4.2 was prepared
with the corrected version.

Upgrading 5Meg to 20Meg

Fm John M. Lewis, Twisp, WA: Dear
Mr. Soltoff, Three days ago I received
diskDISK, RSHARD, and the Seagate 20
Meg Bubble. I am just now composing
this letter with Scripsit with the bubble
installed, configured, and formatted.

I am, by no means, handy with hardware.
I installed the bubble in my old Radio

Shack 5 meg case. Can you imagine the thrill of looking inside the HD for the first time? I even hooked up the orange, white, and yellow wires! I tacked solder to the edge of the appropriate connector fingers of the edge cards. I followed traces back a bit to try to find feed through pads but got lost in the traces twice so just tacked solder to the fingers (a rather sloppy job and a little too far to the front of the finger, I feared, but it worked!!). I had to take the cosmetic black front piece off the 20 meg bubble and extend the yellow and white wires with more wire.

I have a Model III that I have modified a little, drive :0 is replaced with a double sided 80 track half height 5.25", drive :1 is with a 80 track 3.5" cutie and I have added two 5.25 80 track external floppies, and now a 20 meg bubble in my 5 meg hard drive.

I have to watch my floppy disks and label them accurately since they aren't interchangeable between 40 and 80 track drives without reformatting. I have a hell of a time with your software on 80 track data disks. My problem is the 3.5" drive as drive :1 and external 5.25" 80 track floppies that won't read 40 track disks. My solution is neat. I soldered four wires inside my Model III to the one of the disk power supply boards, (the power demand of my new drives is far less so I think I'm ok) brought the wires out of the computer to one of my old Tandy drives that I replaced. (I'm going to build a nice box and switch for it one of these days). I just unplug my external floppies, hook up my old Tandon (40 tk. single sided) and transfer files to my new 3.5" drive :1. Tandy sure wouldn't recognize this stuff now let alone work on it.

The software was just as fun. I read the documentation to RSHARD several times over several days with time to think about things in between, then I practiced configuring my 5 meg lots of different ways since it was backed up and I knew it was going to be replaced. All this was in preparation for my new 20 meg bubble. The configuring was a little tricky of course, with swapping :4 with :0 and :5 with :1 and using Driver="mod3" for my four floppies. Listing your JCL's such as INIT54 referenced on LDOS 5.3

README/TXT were very helpful. I configured the new bubble into 4 partitions, two heads at 307 cyl. each, in four sections. This took the 20 megabytes.

I'm going to close this letter and work on diskDISK now. Feel free to edit and/or use parts of this letter in The Quarterly.

I often see comments in The Quarterly and elsewhere that it is over the average users head. At one time it was over my head, but as I grow into my equipment I grow into The Quarterly. Without the back issues I could not do the things I do today or would not have tried.

You are a good person and MISOSYS is a good thing.

Model I

Fm Scott Silverstein: I have some questions and comments about my "new" Model I TRS-80! Being a ham and hamfest-fan, I periodically pick up pieces of computer equipment when I see 'em cheap enough. Last weekend I bought a 16K Level II Model I, with 32K E.E., buffer cable and two Tandon floppies (kerchunk) for the grand sum of \$50. A good deal (almost as good as the Model 4 128K with 5 Meg HD for \$100 at the last hamfest!!) Visit those 'fests folks!

After de-basement-izing and contact cleaning, the darn thing works! There are no "mods" - no lower case, no double density, etc.

One minor problem: there was no software with the thing. I have only TRSDOS 2.3b from a model I version of a III package.

1. Anybody have a (cheap) source of Double Dens. mod?
2. Anybody have source for lowercase

mod?

3. Are there any patches to TRSDOS 2.3b? It seems flakey. When I created, for ex., a file with the square roots of 1 to 100 from BASIC, and list it from DOS, alternate attempts produce garbage at the beginning of the listing. Yet BASIC 'reads' it OK every time.

4. Anybody have LDOS cheap? (and VTOS, for historical interest)

5. The E.E. is missing all the little "doors." Anyone have 'em?

Fm Joe Kyle-DiPietropaolo: Scott, 1) Try Aerocomp for their DDC. I think it was around a hundred bucks, they may still have some left.

2) RE: lowercase - If you order the lowercase mod from Radio Shack National Parts, it isn't too hard to put in. One trace cut, replace a chip. If the chip isn't socketed (some weren't), you need to desolder the chip and install a socket. There's the Electric Pencil lowercase mod too, that requires a switch.

3) TRSDOS 2.3b is weird, so is RS's DD system (TRSDOS 2.8), so get LDOS instead.

4) LDOS is available from Roy, call him at 1-800-MISOSYS.

5) You don't want the doors, they just make the cable connections even less reliable

Hard drive booting

Fm Ms Shirley M. McCowan: In reference to LS-DOS 6.3, We understand that your company has purchased and now supports the LS-DOS 6.3. We are owners

of two (2) TRS-80 Model 4P's, and would like to know what will be available to the user's of LS-DOS now.

We have enjoyed using the TRS-80 Model 4P's and really didn't want to go MS-DOS, we have put our Model 4's on "hard drive" and would like some technical information. We still use a floppy boot disk to bootup. What we would like to do is to put the floppy bootup disk on the hard-drive to do an automatic or "auto"; in other words we want to "turn-on" the computer and it go directly to the "hard drive". Contrary to the belief that this cannot happen, we believe that you can do this. With MS-DOS, you have to build an "autoexec" batch file, even though LS-DOS does not have "autoexec" it does have "auto", is it not possible to build an auto file, by building a "DO" file in LS-DOS language?

We realize that this is a pretty tangled question, however, since TRS-80's are not PC-compatibles, it would seem feasible that this could still be accomplished.

Could you please inform us of the future plans for LS-DOS? Are you planning on going PC-compatible? And who do we go to for our technical support?

We would appreciate any information concerning this matter, and could you also provide us with the listing/availability of "books" that reference the LS-DOS language. We feel the information that has been provided to us is limited and we are interested in furthering our knowledge of LS-DOS.

Thanking you in advance for your expedient reply and our apology for any inconvenience this may cause.

Fm MISOSYS, Inc: Dear Ms McCowan, One good way of keeping in touch with the TRS-80 community of users is by purchasing a subscription to *THE MISOSYS QUARTERLY*; at \$25/year for four big issues, that's a bargain.

I'm enclosing an excerpt from a recent issue which addresses the very question of booting directly from your hard drive

on a Model 4P. Check with M.A.D. Software for a solution.

Future plans for LS-DOS? We'll still support it for as long as we stay in business; I expect that's for many more years. Technical support for your Model 4P computer rests with Tandy Corp.; support for LS-DOS rests with us.

MISOSYS does have MS-DOS products, but there is no concept for LS-DOS to be "PC-compatible" - the two are mutually exclusive environments.

Home Accounting

Fm Frederick B. Heitkamp, Jr., 70 Elm Ave., Larkspur, CA 94939: Dear Mr. Soltoff, I have been meaning for some time (a little over a year?) to comment on issue III.i - Summer, 1988. On page 23, there are queries from Patrick H. Larkin and Walter Royal Jones, Jr. - both inquiring about programs for the Model 4 which are comparable to The Home Accountant.

In 1985, I wrote a "PERSONAL LEDGER" set of programs - both to do my own personal accounting and to offer for sale. It is a souped-up version of a "PERSONAL FINANCES" program which I wrote for the Timex Sinclair computer, which in turn was a subset of a system I have been running on various computers (usually mainframe) for over 20 years.

But, by the time I had finished a user manual (with time out for various bird-in-hand moonlighting assignments), two things had happened to dissuade me from attempting to market this product: 1) The Model 4 had become obsolescent. 2) I was drawing Social Security and was thus limited in the income I could earn without penalty.

I have two extra copies of the user manual

(which is slightly out-of-date due to minor enhancements made since 1985). I would be willing to sell these (together with the programs, naturally) for \$25.00, if the purchasers will offer comments and criticism. If the system generates any interest, then perhaps I will update the manual and take out a small ad in the *MISOSYS QUARTERLY* - I no longer have any fear that I might exceed the Social Security earnings limit.

Fm Richard R. King: Would you include our TRS-80 club on your list?

Raleigh Tandy Users Group (RTUG)
808 Orleans Place
Raleigh, NC 27609
(919) 872-5846

I can now run XLR8er at 0 software wait states successfully. (There's still a hardware wait state built into the board a la SB180. (See Byte, 9/87, P-94, bottom center, IC15.) The kbd. strobe problem isn't the PAL (the same PAL type is used for the 128-K feature); it's the MC14502B kbd input chips U44/45 (p,4A), with their utterly slow propagation times. Using one Motorola 74HCT245A (not pin compatible; MUST be an "A"), the problem literally disappeared. Before my mod, one wait state created trash when holding <CLEAR><SHIFT> while pressing ">", "?", "A", and others; zero wait states killed the entire keyboard immediately.

Glad to see the family column back. With five of our own, I've travelled your paths. Enjoy the times; they pass quickly, and there's no going back.

Replacement CRTs

Fm Samuel J. Wells: Dear Roy, I need to report to you that the HUBCUG users group in Hattiesburg is defunct. Too many college student members graduated and moved away. We are presently trying to regroup and will advise if we are able to rise like the proverbial Phoenix from our own ashes.

Also, for your info, some inexpensive green phosphor CRTS (12" Green CRT for TRS-80; 12.95 #DJ12NK4, Zenith CRT) are presently available from:

Fair Radio Sales
PO Box 1105
1016 E. Eureka St.
Lima, Ohio 45802-6573
1-419-227-6573

I've received one bad tube in a lot of 3 which Fair Radio Sales has replaced post free. Pretty good deal, also comes with a hi voltage power supply board, but works fine with existing mod 4 board, yoke, etc. Thought you might want pass the word along. I don't know how long this deal will last.

Thanks, always enjoy reading TMQ and try to support your effort when possible.

Durability of data on floppies

Charles A. Ainsworth
P. O. Box 2107
Woodbridge, VA. 22193

Dear Roy, In past issues of TMQ, some slight reference was made to the archival durability of data on floppy disks, and presumably someone believes that, after a certain time in storage, recorded data

may tend to fade, although I don't recall any actual figures on the time that data will remain reliably usable on them.

This letter does not call for a specific reply, but rather is written with the idea that the subject might be addressed in TMQ if anyone you know has reliable data on the subject.

I have a collection of many valuable archival disks. The nature of my work, involving large (I might even say "huge") amounts of word processing, requires that a permanent record be kept of my output. By "permanent" I mean five, ten or more years as required by each specific job. Currently I have many hundreds of disks of such stored data, and my concern is the possibility of fading and the consequent necessity of refreshing such disks by copying to newly formatted ones before fading takes place; a rather formidable task, at the thought of which I sometimes shudder.

As an old timer, I became involved in magnetic recording when the first tape recorders became available to the public, perhaps some time in the mid fifties. In those days it was said that coating technology was such as to make recordings permanent and of indefinite durability, except for the polyester base which might dry and crumble in time. That polyester soon was replaced by mylar for tapes and then the recordings were guaranteed as Completely permanent and of archival quality. I still have audio tapes I recorded in the fifties and they operate perfectly. Of course, the demands on recordings for computer use may be more stringent than for audio.

I would believe that audio tape technology eventually found its way into the early creation of computer floppy technology, possibly with many improvements; so a first approach might reasonably be that computer recordings should last at least as long as audio ones, which in my case would mean more than forty years.

Obviously the duration of a recording might be affected by storage conditions such as temperature, stray magnetic fields and such. In my case, all recordings are carefully stored to avoid any such deleterious effects.

rious effects.

All my recordings on floppies have been made on reputable well-known brands (no cheapies) and with properly adjusted and serviced drives; the first recordings in my collection date from late model I days. I have made a few random samplings of my older disks for readability and all check out perfectly (but obviously that doesn't necessarily mean they are all perfect).

It would be nice to know what others think so I could plan to refresh my archival disks if anyone could show such a thing is necessary.

4-P Modification

Fm Dayton Sumner: I have long wanted to upgrade my 4-P to double sided drives. I am afraid to attempt the conversion myself. Do you know anyone in the Washington Metro area who might do it for a price? I'm only an hour from the Washington Beltway and could hand carry it there most any time.

Fm MISOSYS, Inc: Why not check with NCTCUG? I'm sure you could find someone there. Check into their BBS at 703-820-8969 or 301-469-8034 300/1200/2400 81N. Or give the Model I/III/4 SIG leader a call. That's Ron Schmidt 301-577-7899.

LNDoubler

Fm Mitch Jones: I'm trying to find an

LNDoubler as well as several more disk drives for my TRS-80 Model 1 with an LNW expansion interface. Anybody know where I might find one?

Fm Joe Kyle-DiPietropaolo: Mitch, you might find an Aerocomp Doubler still available from Areocomp; LNW is long out of business, but I believe that anybody's double density mod should work in the LNW Interface.

SuperSCRIPSIT DWP 230 driver

Fm Dave Krebs, 124 Woodhill Drive, Amherst OH 44001-1614: Dear Roy, I just received TMQ IV.i today and read a plea for a SuperSCRIPSIT driver for the Tandy DWP 230 from A. Baracos of Winnipeg.

I DL'd one to your CIS LDOS forum (DL0) that I wrote. It supports the BOLD PS wheel and a Letter Gothic 15 in addition to the usual 10 and 12 pitch printwheels. It also provided a /TAB file for support of the same printwheel with AllWrite!. I was going to suggest that Mr Baracos DL the file but I looked tonight and the file is no longer in the DL. There were actually 2 of them, the latter, dated 8/87 was a slightly revised version. I can provide the /CTL /TAB and /ASM files on a disk for Mr Baracos if he wants them.

If you can send me Mr. Baracos's address, I'll see that he gets a disk post haste. A post card is enclosed. Thanks for being a go-between.

Fm MISOSYS, Inc: Thanks for the assistance. His address is on the card being sent back to you.

Clubs & BBS systems

Fm MISOSYS, Inc: If you are a 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 am including 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.

hello, world
(817) 840-2140
300/1200/2400 8N1
24 hrs/day, 7 days/week.
Stone Mountain, GA
(404) 292-7603
1200 baud, 8N1

8-Bit Tandy BBS, San Diego, CA
300/1200/2400 8/N/1
Model I/III/4/100/102/200/OS-9
619-571-6366 (24 hrs)

REMS-80 #001 (505) 624-0811
DataServe (204) 239-7103

Resource: Computer Clubs

Mid Cities TRS-80 Users Group
(MCTRUG)
P. O. Box 171566
Arlington, Tx 76803

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

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

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

Valley TRS Hackers' Group (VTHG)
12240 Archwood Ave.
North Hollywood CA
Eric Bagai, 818-982-0467

Valley TRS Users' Group (VTUG)
20920 Knapp St.
Chatsworth CA
Lance Wolstrup 818-716-7154
San Gabriel Valley TRS Users' Group
(SAGATUG)
405 So Santa Anita Ave, Arcadia CA
Dr. John Phillips 714-592-4178

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]

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

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

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: Contact MISOSYS effective 11/1/89

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

RANTECH Computer Systems, PO Box 1101, Clackamas, OR 97015 [503-771-0390]

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

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

T/Maker Research Company, 812 Polard 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]

Are you still fussing with floppies for BACKUP? Our QIC40 JUMBO tape drive from MISOSYS is your solution!



The Colorado Memory Systems' JUMBO tape drive is one drive that fits all computers. It comes ready for internal use in AT's, XT's, and PC's, and connects to your floppy disk controller. Our adaptor board can be used to connect JUMBO when all FDC connectors are in use. Kits convert Jumbo to external use.

- In about 5.5 minutes, JUMBO backs up 10MB's file-by-file - the fastest in the industry! 40MB's gets backed up in about 18 to 20 minutes. Uses industry-standard DC2000 tape cartridges.
- JUMBO plugs into your floppy disk controller to save cost, power, and a slot. Needs 5-1/4" (or 3.5" with faceplate) mounting slot.
- Our tape adapter board mounts in your host computer to provide two more floppy ports — especially useful in 286 and 386 computers. When used with our external JUMBO, it lets you share your JUMBO drive between computers.
- JUMBO has custom chips, high speed brushless motors, automatic circuits, no pots to vibrate out of calibration, and fewest parts to assure long life and technical leadership for years to come.
- By using advanced Reed-Solomon error correction, JUMBO typically backs up more than 100,000 cartridges before encountering its' first error — of less than one error per 1000 years if the cartridge is fully backed up every working day.

Jumbo	\$295 (\$5S&H)
Tape Adaptor	\$75 (\$3S&H)
External Adaptor	\$110 (\$5S&H)
DC2000 tape	\$22.50 (\$2S&H)

M/C & VISA. S&H are U.S. only.

MISOSYS, Inc.
P.O. Box 239
Sterling, VA 22170-0239
800-MISOSYS
or 703-450-4181

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TRS-80

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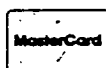
Last year there were 5 disks for Personal Taxes, and 3 disks for Business Taxes, for the Models III and 4/4P. There may be another Personal Disk this year depending on how many new Forms are necessary. There are twice as many disks for the Model I.

The Personal Series includes the 1040, 1040A, 1040 X, 1040 ES, all Schedules, and Forms 2106, 2119, 2210, 2441, 3468, 3800, 3903, 4136, 4137, 4562, 4684, 4797, 4835, 4868, 4972, 6251, 6252, 8027, 8283, 8396, 8582, 8606, 8615 and 8814.

The Business Series includes the 1120, 1120 A, 1120 X, 1120 S, 1041, 1041 S, 1065, 2220 and Schedule D, 1120 S, K-1, 1120 S, K-1, 1041, 8656, 7004, Schedule D, 1065, K-1, 1065.

"Signature Forms" (1040, 1040A, 1120, etc.) are for use with Overlays; all Forms and Schedules are Computer Generated.

Write for Listings and Prices



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931 SO. BEMISTON
ST. LOUIS, MO 63105



PDUBL/RDUBL: drives >3

Fm Daniel L. Srebnick: I am using LDOS 5.1.4 on the Model I with RDUBL. I attempt to format an 80 track DSDD diskette with the command:

Format :6 (Sides=2,Cyl=80,DDEN)

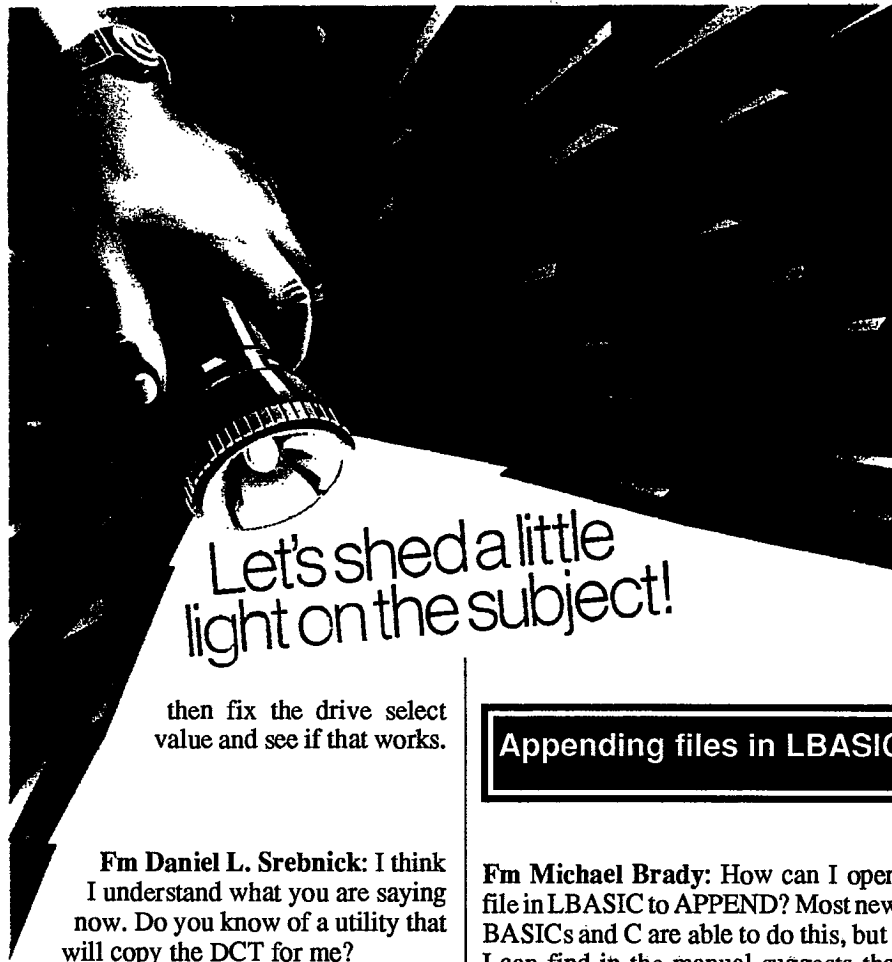
and I end up with a single density 80 double sided diskette. Do you know why the double density parameter is being ignored?

Fm Joe Kyle-DiPietropaolo: Daniel, Probably because you have the drive over there in :6, I seem to remember something about this. Is it up there because of a hard disk? If so, you may need to rebuild your configuration by moving everything around with the "normal" DCTs, and then executing RDUBL afterward.

If you dump the contents of all your DCTs for floppy drives, you'll probably notice a difference in the driver addresses. If so, you may be able to patch directly in memory and re-SYSGEN.

Fm Daniel L. Srebnick: Yes, it is up on :6 because of a hard drive. Are you implying that if I move it down to say :3 that the format will work ok? It would sure be a pain to have to rebuild the entire configuration off single density diskettes!

Fm Joe Kyle-DiPietropaolo: Well, no, just moving the DCT won't help. The problem is this. When you execute RDUBL (or PDUBL for that matter), the DCTs for all existing five inch drives are modified for double density operation. Of course, drive six wasn't a floppy drive when you executed RDUBL, was it? You had to put it in with MOD1/DCT, right? If so, I believe that the driver address is wrong. Drive four is what was the drive zero floppy, right? Try copying the DCT contents from the #4 DCT to the #6 DCT and

DOS Subjects

then fix the drive select value and see if that works.

Fm Daniel L. Srebnick: I think I understand what you are saying now. Do you know of a utility that will copy the DCT for me?

Fm Joe Kyle-DiPietropaolo: Not off-hand, but the addresses and format for the DCT is documented in the technical section of the Model 1 LDOS manual, and you can copy/modify blocks of bytes in memory with DEBUG. Make a backup of your working disks and when you've got a configuration that works you can just SYSGEN the change as SYSGEN does save the DCT areas.

Fm Daniel L. Srebnick: OK then, I will pull out the manual and get to it.

Appending files in LBASIC

Fm Michael Brady: How can I open a file in LBASIC to APPEND? Most newer BASICs and C are able to do this, but all I can find in the manual suggests that I have to write a new file then call the APPEND command in the OS. Ideas? I'm using LDOS 5.1.4.

Fm Bob Haynes: For random access, open the file, use LOF (x) to find the last data record #, bump it and PUT to your heart's content.

For sequential access, open the file with the OPEN "E" (extend) command.

Hope this helps - it's been AGES since I've touched LBASIC!

Fm MISOSYS, Inc: Use OPEN,"E",... for open to extend a sequential file. When in doubt, turn to the manual on page 5-61 (of the edition I am looking at). If you would be using LDOS 5.3, a simple HELP BASIC OPEN would have given you the answer, if you invoked that from DOS Ready, or via CMD"HELP....".

Some BASIC routines

Fm Murray W. Diller, Phoenix, AZ:

Gentlemen, A short note to let you know how much the Misosys Quarterly is appreciated. It usually requires a much as four readings before most of the material sinks in and even then much is over my head or has no application with what I do. There have been many ideas and programs that are worth several years subscription to me. Especially ERAMLD and PEXMEM which has been a life-saver.

It has occurred that many readers are in the same position where they program in Basic for their own needs. Enclosed are some things put together over the years that made programming easier and the appearance and operation of the programs neater. Maybe one may be useful to someone.

As an aside, Vol IV,i pp 26 Doubling of Files - Revisited caught my eye. When the M4 arrived my M1 went. Now there are an M4 & M4P both gate array each w/ 128k, R/S Graphics and R/S 5Meg HD. The M4 also has an XLR8er. Tried one in the 4P and it would not work. Each carries the same files & programs in a different city. There are some 200 data files, all sequential except one. Through all of the TRSDOS6.X releases trouble was experienced with duplicate files at random from using the OPEN,"E",1,"file/ext:dr" but never with OPEN,"O",1,etc on the early PAL as well as the Gate Array's.

```

4300 ' AN ASC PROGRAM OF USEFUL SUB/ROUT FOR A NEW PROGRAM - M
Diller 09/17/89
      load and relocate as best suited for program as s/r or line
statements

4408 ' change function keys to aid multiple data entry
4410 POKE 2328,47:POKE 2330,45:POKE 2332,44:RETURN ' F1 is now '/'
(slash), F2
      is '-' (minus) & F3 is ',' (comma)

4500 ' return function keys to normal asc startup state
4510 POKE 2328,129:POKE 2330,130:POKE 2332,131:RETURN

4600 ' screen print s/r - Prgm must defint J,X:dim J(5) other let-
ters may be

      used if changes are made in 4620
4610 PRINT,"Press [F1] to Screen Print or any key to return"
4620 I$=INKEY$:IF I$="" THEN 4620 ELSE IF I$="/" THEN J(0)=107:
X=USR11 (VARPTR(J(0))):GOTO 4610 ELSE RETURN ' assumes roke
2328,47 for "/"
      has been made else I$=chr$(129)

4700 ' Select s/r, use for menu selection
4710 PRINT:PRINT,
4720 PRINT"Your Selection ";:IF L$="" THEN PRINT"([0] Escapes)
==> ";
      ELSE PRINT"==> ";

4730 WHILE INKEY$<>"":WEND:I$="" :WHILE I$<L$ OR I$>H$:
I$=INPUT$(1):WEND:PRINT I$:I=VAL(I$):RETURN 'L$=lowest selec-
tion or 0,
H$=highest selection, I should be DEFINT, on return use ON I
GOTO (GOSUB)
xxx,xxx, etc, 0 falls through

4800 ' yes/no selection s/r
4810 PRINT:PRINT,
4820 PRINT"Y/N ==> ":YN$="" :WHILE INSTR("YN",YN$)=0:
YN$ = CHR$(ASC(INPUT$(1)) AND &HDF):WEND:PRINT YN$:RETURN

4900 ' Ang key s/r
4910 PRINT @ (23,22),"Press any Key to Continue":;
      WHILE IKNEY$ <>"":WEND:WHILE INKEY$="" :WEND:RETURN

5000 ' Move cursor up one line & erase line s/r
5010 PRINT CHR$(27) CHR$(30):RETURN

5100 ' Reverse video s/r
5110 PRINT CHR$(16):RETURN

5200 ' Regular video s/r
5210 PRINT CHR$(17):RETURN

5300 ' Line Printer not readg s/r
5310 IF (INP (248) AND 240) <> 48 THEN PRINT @ (23,24),"<Line Printer is
not Ready>";
5320 RETURN

5400 ' Scroll protect s/r
5410 I(0)=15:I(3)=&H703:X=USR11 (VARPTR(I(0))):RETURN ' scroll pro-
tects
      3 lines, I & X defined as integers, DIM I(6), change 3 in 703
to
      number lines wanted protected

5500 ' unscroll protect s/r
5510 I(0)=15:I(3)=&H700:X=USR11 (VARPTR(I(0))):RETURN ' same needs as
5400

6000 ' save program with same name/ext & drive each save

```

When LSDOS6.3 was announced two were procured immediately in hopes of the problem being corrected. It was not. A letter of inquiry to Logical Systems drew the response that they were aware of the problem but it was in BASIC and not DOS. Strangely the problem has disappeared for the last several years with no changes in programing or equipment repair. This was extremely aggravating as daily some 50 files are extended after which it was necessary to check the DIR for lack of + signs, renaming of duplicates, appending, deleting etc before backup. The article reminded me of this and I hope it doesn't return. This is of little use to you but thought would pass it along as the disappearance is most interesting.

Please count on my continued subscription as long as you can continue to publish the Quarterly. For this person it is truly a bargain.

Model 4 BBS Software

Fm Dennis Earl Copeland: OK gentlemen: Enough beating around the bush; Who or where can a good bbs program for Model 4 be obtained. My patience grows very thin, because my board members' do too. I need a good BBS for the M4 with ds floppies and 15meg hd. Need the required maintenance programs, sample files, main programs and also the always required DOCUMENTATION! I don't mind buying it if it isn't too expensive. It just seems that wherever I check that nobody wants to turn loose of one. All I want is the skeleton bbs system to customize for myself. If I had something you wanted, I would certainly offer it up.

Now, in another vein, need to know if anyone has grafted the ymodem 1k and/or 1k batch protocols into xt4 or a program like it. If so, the same parameters in line 2 are needed for that. I Enjoy the forum, Thanks for your help and comments.

Fm Pete Granzau: You might try Mel Patrick's BBS Program, I think he calls it FASTBBS or something like that. His own BBS is (604) 594 7398. His term program, FastTerm 14.x, is in the DL here, and includes 1K XMODEM (if that's close enough to YMODEM for you). ShareWare, not PD, but my own program of choice on the local BBs.

Fm Alan Varga: Try Mel Patrick's Fast-Plus BBS, available from the author. He runs his own BBS with his own software and has Ymodem and 1K Xmodem available at least on the receiving end (FastTerm II with scripting). So far all of the software I've gotten from him is reasonably priced and works without bugs (wow!!). Give him a call at (604)594-7398 24 hours a day (give or take), 3/12/2400 baud, UART 8/N/1.

Model 4 startup - for techies

Fm Bob Haynes: I really hate to give in to this, but, well, I'm trying to trace through normal boot sequence of 6.2 via *The Source* (sticking to basics here, not attempting either HDBOOT or LSDOS, for neither of which have I commented code). No sweat up through most of SYSINIT, as far as line 24150 (*Source* V1, pg 112). But I don't understand the call to @ICNFG!

OK, CONFIG/SYS gets @LOAded (line 23930) into 1E00H, overlaying SYSINIT, that's why the stub had to be moved, right? And I presume the xfer address of 0000H is to keep folks from playing with CONFIG/SYS as a /CMD file. So my natural guess is that the @ICNFG call does a JP 1E00H to run the config code, and the RET when done there brings us back to line 24170. What confuses me is, how does the original vector (C9 00 00)

get changed to C3 00 1E (if it DOES)? I figured it had to be the previously executed SYSGEN command, with the change loaded in with SYS0, but I can't find a trace of @ICNFG modifying code in SYSGEN anywhere!

What's happening here?

Fm Adam Rubin: Bob, I can see why you're getting confused. Let's start by taking one step backward, and see how @ICNFG gets set up in the first place.

Okay, you have just booted up your working copy of TRSDOS 6.2 on your Model 4/4P/4D, and it may or may not have a CONFIG/SYS file on it. Anyway, you decide that you would like to add *CL to your system. So, you SET *CL TO COM/DVR. (Nothing specific about COM/DVR, but it makes a nice example.) Now the COM/DVR file has two parts: the actual communications driver, and the program to install it in memory. The installation program figures out whether the resident driver should go into high or low memory, relocates any addresses, and moves it. Of course, every time the computer is started up, \$CL will need to reset the UART, set the interrupt vector and interrupt mask, and so on. How do we make sure this gets done? We chain into @ICNFG. We get the existing three bytes of @ICNFG and store them (you'll see where in a moment), take the address of the com init routine that's in \$CL, and put a JP to the com init routine into @ICNFG.

So, @ICNFG is now a JP to the routine inside \$CL that does all the com init, and \$CL is in either low or high memory. The last instruction of this routine is the three bytes that were previously in @ICNFG, so the last step of the com init is to do whatever @ICNFG had pointed to before we installed COM/DVR. If anything else had been using @ICNFG, this will be a jump to the last thing installed; if not, it will still be a RET. All this make sense so far?

Now, we SYSGEN. (Because I say so, that's why.) The SYSGEN command creates the file CONFIG/SYS (you were right about its transfer address). What is

in CONSIG/SYS? Just about everything in memory that the user could change: high memory and low memory modules, the system flags, user-programmable SVCs, interrupt vectors, @ICNFG, DCTs, the VERIFY flag, the cursor character, and all sorts of good stuff. Now that you've SYSGENed COM/DVR, you can turn the computer off, and find out what happens the next time you boot up.

Back at the computer again... boot up the disk that has the SYSGENed COM/DVR on it. As you've noticed, the system gets ready to @LOAD CONFIG/SYS, but makes sure that control returns not to 1Exx, but to 43xx. (4300-43FF was overwritten by the boot sector already, so why not keep the rest of memory as intact as possible?) Why can't the system load CONFIG/SYS and return to 1Exx? Well, what has to be done before a file can be loaded? That's right... @OPEN, and THAT is what clobbers 1Exx. CONFIG/SYS loads into — well, loads over would really be the right term. High and low memory modules are loaded directly into high and low memory, the system flags are loaded directly onto the system flag table, the VERIFY flag is loaded right onto the VERIFY flag, @ICNFG is loaded right onto @ICNFG, and so on.

There's one thing we can't overwrite while the system is loading CONFIG/SYS, though... the DCTs. If the first part of the DCTs pointed to one driver, but the rest of the DCT referred to another... ecch! So, the SYSGENed DCTs get loaded into 43xx, and then copied to the actual DCT tables.

As I mentioned, when the system loaded CONFIG/SYS, the @ICNFG that was SYSGENed was loaded right into the @ICNFG location. So, the system can now call @ICNFG, and what happens? Well, @ICNFG is a jump to somewhere in \$CL, so it jumps there. It resets the UART, sets up the appropriate interrupt, etc., and then executes what had previously been the @ICNFG vector. Eventually, it gets to the first module that was installed in the @ICNFG chain, and executes what had been @ICNFG before that module was installed, namely RET.

So, control returns to 43xx, and booting is

almost over. Just a few more details, and then either execute the AUTO command, or @ABORT if there's no auto command.

direct statement in file

Fm James Riddle: I have a Model 4D computer and I'm using Compuserve's VIDTEX for a Model 3, TRSDOS 1.3, to access programs in the LDOS/TRSDOS6 libraries. I'm having some problems running the programs, mainly the ones that are graphics programs, after downloading. I'm coming up with a "direct statement in file" error when attempting to run them. Any help you can offer will be appreciated. If you can suggest a particular graphics program that will run reliably on my computer, please do so.

Fm Jim Beard: The message "direct statement in file" appears when you have a line without a line number. This can happen when a carriage return appears in a line when it shouldn't, which can happen when you use BASIC programs with lines longer than 80 characters. List the file, exactly as downloaded, to the printer using "list <filename.ext> (P)" and look for long lines in the BASIC program. Then, load the file into BASIC and do a LLIST command. Compare the printouts, and use the line editor in BASIC to get the file, as loaded into BASIC, to agree with what appears when you use the DOS "list" command.

Fm Joe Kyle-DiPietropaolo: One other thing, James, make sure that the program you are trying is in BASIC. Many of the programs available here aren't, so there might be a bit on confusion. Why don't you give us the names of a few of the ones you are having trouble with, and let's see if we can get you going.

RSHARD and step rate

Fm Theodore Masterton: I am still considering replacing the bubble in my RS hard drive. RSHARD mentions a stepping rate. I am not sure how to acquire that info for the take-outs and rebuilds I am considering, some of which are DC'd bubbles from now-defunct manufacturers. I also do not know how much it really matters. What are the consequences of not optimizing the stepping parameter in RSHARD?

Also, as a curiosity, I have noticed much ado in the MSDOS world re: interleave and disk optimization, while almost no mention in the LDOS/ LSDOS world. Is interleave an issue in RSHARD? Just invisible to the user? Or did the DOSers invent the topic?

Fm Joe Kyle-DiPietropaolo: Most drives built after 1981 or so fully support "buffered seek". This means that within certain limits, you can set the step rate anywhere and the drive will work fine. Best performance will generally be at the highest step rate available from the controller. The drive itself will accept the step pulses and when it has received "all of them", it will move the head the total distance indicated, but at the fastest rate it can regardless of the speed at which the step pulses were received.

That said, there are a few drives that have a very tight "window" on their buffered seek operation. That is, the pulses must come in at the actual step speed of the drive (very slow, like 3 ms.) or very fast (like 10 us.). Anything in between results in very poor performance. It is very unlikely that you would run into one of these, as I recall they were all very high capacity drives.

RE:interleave - Adam Rubin and I went through this once some time back. I believe that the answer was to accept the default interleave provided by the formatter. He tried a bunch of different interleaves, and only a few operations would

accept a tighter interleave with a performance improvement. Perhaps Adam remembers his test results in more detail or has the information on file.

Fm Shane Dawalt: Although I do not have a hard drive, I do have floppies. I too realized the ravings of disk optimizers in the MSDOS world (I use a shareware optimizer on my MSDOS HD), but nothing was said in the LSDOS world. In fact, I cannot understand why. I have a couple floppies I'd would dearly like to optimize. I'm sure LSDOS HD's get just as fragmented as MSDOS HDs.

Before people holler the obvious: yes, I know I can format a new disk, do a backup reconstruct and I'm done ... but a backup reconstruct takes a good deal of time to execute. And don't forget I must format AND verify a disk. That is not a fast process either. I'm sure an optimizer could do the job at or under the time taken to perform the two preceding actions given that fragmentation wasn't as bad as 8 fragmented blocks per file.

HP Laserjet

Fm John J. Kennedy: Have replaced honorable NEC pinwriter P3 with HP laserjet using parallel interface connection from 4P. Find unable to print anything except one line even when redirecting dir :0 to printer (i.e. overwrites same line-doesn't understand CRs.) Is there a driver needed and is it available from the library to make the laserjet at lease function as a line printer?

Second question. Fired up my 15 meg Tandy HD and get nothing but write protect light on steady and "Error 11H" messages when LSDOS 6.3 attempts to boot up HD as drive 0. Suspect my bubble has gone to happy hunting ground as it has

been making noises sounding like dry bearings when starting up or turned power off. Is this worth fixing at RS or should I order a 20 meg HD drive from Roy Soltoff and can the RS HD drive? I backed up the drive regularly so shouldn't be a hassle getting started again but suspect 15 meg bubbles are rare finds anymore?

Fm Joe Kyle-DiPietropaolo: Jack: Not to usurp Jim, but my two cents says you are right on both counts.

RE: The LaserJet - install the printer filter with the ADDLF parameter. That's PR/FLT in LDOS 5 and the FORMS/FLT in LS-DOS/TRSDOS 6. Should fix you up on anything that goes through the OS for output.

RE: The Hard Drive - the write protect light on steady is odd. The switch isn't pushed in, eh? Could be drive, could be controller, could be cabling inside the drive. What does the green light do?

Fm MISOSYS, Inc: I'll double that. Just connected up my NEC LC890 to a 4D to run about 3 inches of printouts. Set up the 890 to Diablo 630 emulation mode at 15 cpi, then installed the forms filter with margin at 10 and chars at 120, along with FFHARD. That sure ran out the paper FAST. I had started to bang out the printouts (for the MSCSI software package) on the old DMP500, but the LC890 was the way to go!

Why set margin at 10? Well my LC890, as is common for a lot of laser printers, does not print within about 1/4th an inch from the paper's edge. That left margin ensures that I don't cut off the left edge of the text and it also gives me some hole-punching space.

Fm Jim Beard: John, Joe didn't usurp me; I was just slow to get back. I'll second his opinion on using the printer filter; it was supplied for just such tasks. The missing LF is a typical CP/M compatibility problem, and the solution has been

around in PR/FLT since ... (you tell him, Joe).

I will go one step further than Joe on the HD. Get Roy's deal. Roy's price, new bubble, and guarantee will beat the value of anything short of just replacing the bubble with a Seagate. That option is what Joe is probably looking for, since it IS your lowest cost alternative. So, you save the money for a new controller, but don't get Roy's drivers and support. Me, I'd take Roy's deal in a minute.

Fm John J. Kennedy: Joe, Green light stays on as well as the write protect light which is not controlled by state of the button. 15 meg bubble makes grinding sounds which would indicate bearings have gone to happy hunting ground. I have ordered replacement 20 meg HD drive from Roy. Am also sending the RS drive out for repair and will use that (eventually) with another mod 4 I have just upgraded with 128k memory.

DOUBLE SIDED DRIVES

Fm Walter P. Sullivan: Radio Shack has quit selling single sided 5 1/4" disks. They have the double sided disk for a bit more money, that will work in a single-sided drive. I feel if I am going to double my expense I should double my capability. Because I am not sure how a double-sided drive works, I have a number of questions.

Is a double-sided drive hardware or software modified. In other words will I have to replace my drive or write a program. When I received my LS-DOS master disk from LSI I also received some literature which had a JCL program and a Format/cmd patch for a DD/DS-40 disk. I made no effort to use this information because I came to the conclusion that

there was a double-sided drive already in the drives they were talking about. They were speaking of the "DISK" only.

Incidentally I went to a Radio Shack Store (not a computer center) and purchased some 5 1/4 Double Sided Diskettes and I received them with these specs "96 TPI, 80 Track". Later I received a gift which were Double Sided Certified Diskettes with specs "48 TPI 40 Track" and they were both Tandy Products.

If I have to install a new drive where can I get one (other than Tandy) and what is the cost of something like this, with or without installation? If without what does this entail? I would appreciate any help I get on this.

Fm Mark Mueller: Double-sided drives are just that: They use both sides of a disk. Your single sided drives only use one side. You can upgrade any Model 1/3/4 to double-sided drives simply by buying the drives and making or buying a cable which has all its connector pins in it. I have (and others, too) flipped the existing cable over 180 degrees and used that.

Anyway, you will need new drives, at about \$79 each depending on where you buy them. Standard 360K "IBM PC" 5-1/4 inch drives work fine in a TRS-80, as well as 80-track 720K 5-1/4 inch and 3-1/2 inch drives. A side benefit is that the new drives use less power, and your computer can power more of them than the circa 1980 drives Tandy supplied. As for the disks, the 96 TPI, 80-track ones were tested to operate in the aforementioned 80-track 720K 5-1/4 inch drives, but will work in any "lower" track count drive, too. Confused yet?

In summary, to do "double sided" you gotta buy new drives. The Model 4 and LS-DOS are already equipped to work with them.

Fm Joe Kyle-DiPietropaolo: In addition to what Mark has said, you can get double-sided drives directly from Roy at MISOSYS (1-800-MISOSYS). He has pretty

good prices, and is very familiar with all the Tandy Model 1/3/4/4D/4P so can make sure you get The Right Stuff. You can call him to get the current prices for drives and the cable you'll need.

One last thing - those eighty track (96 TPI) disks you got - make sure that they say Double Density or Quad Density rather than High Density. The latter are not designed for these systems, and will not be reliable.

LSDOS A/L File Access

Fm Bob Haynes: A little help, please?

I need to @get/@put to a file from within a keyboard filter, and need to minimize i/o buffer space. The file must be maintained as LRL=256, since it must be easily accessible by a text editor.

1. Can the file be opened as LRL=256 with a 1-byte buffer if access is limited to @get/@puts?

2. Is it necessary to poke FCB+9 with an LRL=1 before access?

3. It is entirely possible that filter invocation could occur during another program's i/o. Need I worry about this, or will DOS automatically queue up the i/o's correctly? The filter has no EI/DI/interrupt/tasking code involved.

4. Could I safely use the system buffer (2300H) under these circumstances? The LIB region is out, as invocation could also occur during a lib command, plus some programs (like SAID) already use that area.

Fm Adam Rubin: 1) No. All disk I/O requires a 256-byte buffer.

2) For @GET/@PUT, any LRL is acceptable. In fact, the "logical record length" is completely irrelevant when doing byte I/O, as byte I/O does not use logical records.

3) I'm not quite sure of the question. A keyboard filter would only be invoked when something requests keyboard I/O. If the question is, "Can I use @GET/@PUT for disk I/O within a filter?", I'm not sure. The answer is probably somewhere in "Programmer's Guide."

4) No. The system buffer at 2300H is used by several other disk I/O routines, such as MemDisk, or allocating another extent to a file, or several other things.

Fm Shane Dawalt: Adam, Hardin Brother's "The Next Step" in 80 Micro presented a simple windowing system for the M4. It was in 3 consecutive articles. Two of the three files presented were filters. The other, I believe, was an operator interface. These filters had to perform disk I/O to bring up a menu-type system in one of the windows while accepting keyboard input. He found that when disk I/O was performed after a key was struck, around 512 or so bytes of system area RAM were destroyed for some unknown reason. Unfortunately, I do not have those issues anymore. I recall one of the titles was "Windows: Open Wide" or something near that. Seems they were Summer issues. Anybody else recall this problem? His solution was to save the 512 bytes or so somewhere, do the disk op then move the block back.

Fm Bob Haynes: Thanks for the comments, Adam...

1/2) Really forgot my thinking cap there! DOS of course must do full sector PHYSICAL i/o regardless of i/o mode or lrl. And that requires a 256-byte buffer. And since @OPEN/@INIT both require a buffer pointer be assigned to HL, that precludes their using a "default" sys buf of any kind. What was I thinking of?

3) Never occurred to me to question whether

@get/@put would be valid within a filter, can't think of a good reason why not! What I'd forgotten was that type-ahead doesn't PROCESS a keystroke, but simply stores it for the next keyboard call. I was worrying about the filter's disk i/o possibly interfering with the external program's disk i/o. I realize now that's not likely to happen. Once again, muddy thinking; must have been a full moon!

4) Yeah, but wouldn't they be finished with the sysbuf by the time a keyboard call came around? Could you expand on this a bit? (Still hoping to steal a 256-byte buffer from low mem somewhere - actually 1920 bytes for a video buffer would be even better; dream ON!

Fm Adam Rubin: Thanks for the pointer, Shane. I found the article you were referring to in the June, July, and August '85 issues of "80 Micro". What Hardin discovered there was that if you invoke any SVC that requires a DOS overlay, the overlay currently in the overlay region gets clobbered (not very surprising). There are easier ways to restore the old overlay than the way he used, but the problem does have to be taken care of one way or another. Thanks for pointing it out!

Fm Adam Rubin: Bob, I don't see any reason why @GET/@PUT can't be invoked inside of a filter, either. Just about every filter does an @CHNIO somewhere, and there certainly could be a file at the end of the device chain. If they can do it, you probably can too.

On to point #4... here's why it won't work. Let's suppose you DO use SYSBUF for your I/O. Now, I sit down at my computer, install your filter, and start running a program. I run the program for a while, and while that's going on your filter does (let's say) 18 @PUTs. So, SYSBUF will contain 18 bytes of data to be saved, and has room for 238 more. Suddenly, my program decides to save something to disk. Hmm... looks like we'll need to allocate some space for that, so we use SYSBUF for a moment. When the program is done saving whatever-it-is to

disk, yes, it's done using SYSBUF, but what does SYSBUF contain? The GAT from the disk the file was saved onto. Where are the 18 bytes your program wanted to save to disk? Clobbered.

The case of @GET is similar. Your filter's first @GET will read the first sector of your file into SYSBUF. If my program reads or writes to MemDisk and its buffer is >7FFFH, SYSBUF gets used for a moment. What will the next call to @GET bring back? No, not your file, but something from the MemDisk sector that was there last.

Is that any clearer? Basically, I don't think there's any free memory below 2400H, except for the low memory driver region.

Incidentally, when were you planning to do the @OPEN/@INIT and @CLOSE for the file your filter is reading/writing? As Shane pointed out, if you do those inside a filter, you have to restore the DOS overlay that was there before your operation. That's pretty straightforward, most of the time anyway.

Fm Shane Dawalt: I thought I Hardin knew about the overlay problem. I recall he did attempt to load in the "last overlay" by using that special overlay code at IY-1 (when IY is pointing to the FLAGS base). Oh well.

CONFIG of BUR\$

Fm Bob Haynes: Roy, I seem to have found both a problem and a solution; let's see what you think.

The DOCONFIG program is wonderfully useful, but I found it has a small quirk when used with PROWAM. I know, you'll say PROWAM can't be SYSGENed or

DOCONFIGed, but I'm not trying to do that; in fact, I'm trying to do the opposite!

Sounds of Source pages being flipped...

Apparently DOCONFIG does not save BUR\$ to its config file (actually a limitation of the sysgen module, I realize), so if PROWAM is installed, used, and later discarded by invoking a /CFG module, BUR\$ does not get reset. After two such occurrences (more with > 128K), BUR\$ is "full", PROWAM can no longer find an available bank, and re-boot is required to install PROWAM.

I considered patching DOCONFIG, but instead decided to "fix" SYSGEN by adding BUR\$ to the save table. I really can't think of a reason BUR\$ shouldn't be sysgened, can you? BAR\$ should not, since that might vary depending on whether an XLR8er board is enabled or not. Anyway, here's the patch:

```
. patch LS-DOS 6.3 SYSS/SYS
to save BUR$ on sysgen
DOC,38=01 00 00 02
FOC,38=00 00 00 00
.eop
```

Your comments appreciated...

Fm MISOSYS, Inc: Since the configuration portion of the DOS cannot deal with "configuring" memory beyond 64K, there is no justification for it "messaging" with either BAR\$ or BUR\$. What you do to your own implementation is your own personal choice.

Incidentally, DOCONFIG does absolutely no saving of any configuration data on its own: it simply supervises the controlled invocation of the DOS' library which handles the creation of the CONFIG/SYS file; thus, you were correct in your thinking to NOT patch DOCONFIG.

By the way, you could have used the BANKER program from TMQ I.ii (Fall 1986) to free up those "unused: banks

Fm Adam Rubin: Bob, I tend to suspect there's a potential problem somewhere, but I can't think of anything offhand. I'll have to think about this one. (I don't have DOCONFIG, but I think I have a pretty good idea of what it does, although not how it does it.)

Fm Bob Haynes: Roy, As long as I can get away with it w/o any inherent system problems, that's fine. It's very handy to be able to p/u or drop a PROWAM config w/o having to fool with multiple commands or re-boot. Thanks for the feedback.

ORCH90 WITH XLR8er

Fm Peter Van Caesele: I was wondering if anyone can tell me how to use the XLR8er board in conjunction with ORCHESTRA 90 (model 3 version). I know how to set the XLR8er up for high speed, but every time I run ORCHESTRA 90, the computer re-boots.

There are probably some undocumented codes used in ORCH90. Are there any other software packages that will not run? Thanks for any help

Fm Adam Rubin: Peter, To run Orchestra-90, you MUST start it by typing ORCH90 in UPPER CASE. I'm not sure why, but if you type "orch90", the program reboots. This has nothing to do with the XLR8er or undocumented opcodes; it's the design of Orch.

From what I've heard, the only commercial programs that use undocumented opcodes (and therefore won't run as is with an XLR8er) are TRSDOS 1.3 and (I think) the ZEUS editor-assembler. A few short patches will fix TRSDOS 1.3; they're

reprinted in the current (IV.i) TMQ. Hope this helps!

Fm Ray Pelzer: Adam, ORCH was programmed to reboot the system if you started in lowercase because the keyboard driver internally expected an uppercase-only mode, and figured that you were running in the wrong configuration if not.

Fm Adam Rubin: Ah, so that's why it does it. (I still don't understand why it's necessary, but now at least I know why it does it. I think an error message and exiting to DOS would have told the user more than an "unexplained" reboot does.) If I remember correctly, ORCH actually takes the command you used to invoke it, sticks a "/CMD" on the end, and tries to open that file. Interesting technique...

Fm Ray Pelzer: If I'm not mistaken, it was part of "the grande scheme" that helped the system to know what type of system it was running on (i.e., mod 1's were "always" caps-only, mod 3's less likely, or some similar weirdness).

More CKDRV data

Fm MISOSYS, Inc: In the last issue of TMQ, I presented a problem of duplicate file names appearing on a floppy diskette; the problem being experienced by a few folks. My internal testing generated empirical evidence which pointed to a problem with gate array machines only; The test program had failures on all three gate array machines at MISOSYS but no failures on any of the three non-gate array machines. Since I did not feel that the evidence was conclusive due to an insuff-

ficient number of machines being tested, I asked others to run the program. Here follows the feedback to date. Note that I still continue to ask for further tests.

Fm Richard R. King, 808 Orleans Place, Raleigh, NC 27609, (919) 872-5846 (after the 4th ring, you hit an answering box): Enclosed is additional documentation [letter to Charles Ainsworth] regarding the MULTIPLE FILES ON A DISKETTE problem discussed in TMQ IV.i. I really hate to burst your bubble as you will see in the letter.

To Charles Ainsworth: Just received TMQ IV.i and noticed your continuing correspondence with Misosys on pages 26-30. I have to be one of those "few other folks" mentioned on P-27, col. 2. After reading and re-reading the article, I tried to call you directly that evening. There are (3) Ainsworths listed for Woodbridge, and I'd have to guess that you are the unlisted one mentioned by the long distance directory operator, since the other (2) numbers didn't Snow of you.

I have several model 4's. None of them is a gate array, nor do any of them have (until recently) the XLR8er. Two of them are Rev. C, and one a Rev. A. All of them have the malady. I use Powerscript's PSCRIPT modifications to model 4 Script. One of the machines has a R.S. Mod III FDC in it, the others use non-R.S. FDC boards (I forget the brands, but they do use the W.D. 1793 or its equivalent Mitsubishi 8877 (uses only 5v., runs cooler) floppy controller. Still, I have seen as many as five copies of the same file on one diskette, on any one of the machines. While I don't have auto-save, I do save often. I did send that original diskette to Roy, after picking out the "best of the five" via HyperSoft's diskette duplication program and additional gyrations. With this was a letter and (if I recall properly) a copy of the DOS 6.3 diskette I was using at the time.

Now here's the kicker, if I may. How many times have you done a DIR or CAT on a diskette (from DOS Ready) and watched the drive light flash momentarily, then have D@OS come back and tell

you, "NO DISK"? Pressing <CTRL><R> to repeat the command causes the diskette to be read properly. NOTHING HAS CHANGED except the ticks of the clock. I am far from a hardware guru, but I do put my hands in the box now and again. Like Roy, I am puzzled, but not to the extent he is, because I have not tried to resolve it. Somehow I believe that the two are solidly related.

At one time I suspected a weak power supply, but one of the 4's has a non-Tandy hummer that'll carry the machine to the ends of the earth (yes, it's a switcher, but rock solid). I wonder if it has anything to do with the period of time when the diskette motors turn on, like a spike on the power supply that reflects back to the DOS somehow.

How's about giving me a buzz sometime (nights are best, to midnight) and let's compare notes if you feel you can add anything more to it. In the meantime, I think I'll send a copy of this to Roy, much as I hate to put a hole in his theory. Guess I'll also try running his test program to see how it fares on a machine not currently receiving an XLR8er board for trials (I'm trying to expand it to its full 500k capacity at the same time; I almost have it working).

Fm Adam Rubin: Okay, I tried your little program on p.27 of TMQ IV.i. In fact, I tried it with both SYSTEM (SMOOTH=ON) and SYSTEM (SMOOTH=OFF). Both times there were no problems, and I finally pressed <break> shortly after 400. This is an early 4P, serial #003701, non-gate-array. The FDC is an FDC1793, apparently from second-source SMC (Standard Microsystems Corp.).

Incidentally, if you're still thinking about this problem (or plan to go back to it someday), here's two related pieces of information. One, I don't think the gate-array circuit has anything to do with the problem. My schematic for the gate-array 4P shows the drives' IP* line meets a 150 ohm pullup, then goes through a 74LS367 (mislabelled on the schematic), and then into the FDC — it isn't connected to the

gate array at all. (In the NGA 4P, it has the 150 ohm pullup, then goes straight into the FDC.)

Second, HDBT2.TXT (4P boot from HD) is now available in Library 0 here. The patch line for SYS0 beginning D0D,0A is eleven NOPs, then send a "terminate command w/o interrupt" to the FDC. A restore with verify had been sent to the FDC by the boot ROM, and at this point the FDC in the GA machines is still reporting "busy" unless there had been a disk in the drive for that command. (Any disk, as long as it returned an index pulse.) The "terminate command" that I added ends the FDC's "busy" status... without it, the FDC never goes un-busy, even with a disk in the drive later on. Of course, this "terminate command" is quite unnecessary for NGA machines, although it doesn't hurt anything. Anyway, I thought you might find that section of code useful for some experimenting. If there's any information you'd like about the code in that file, just ask.

Fm Bob Haynes: A quick note to provide you a bit more empirical data on your quest re DOS 6.x CKDRV, GA vs NGA systems. (TMQ IV.i, pg 27)

I've been running your little program (loop expanded to 10K, sys memdisk implemented) on my two 4Ps.

The NGA machine is up to 8450 iterations w/o a skip. The GA machine is another matter. Program run 5 times, "file not found" error occurred at the following iteration counts:

Run #1 - 22 iterations
Run #2 - 42 iterations
Run #3 - 86 iterations
Run #4 - 328 iterations
Run #5 - 405 iterations

Sure do look like a hardware problem, huh? Hope this is of some value to you.

Fm Adam Rubin: Interesting... I see that the number of trials until failure goes up

each time, too.

May I make a small request? Would you be able to change the end of line 10 to PRINT "Iteration ";I;" FDC status ";HEX\$(INP(&HF0)) and try that test once or twice more on your GA machine? If my guess is correct, you'll get anything the first iteration, A0 hex the rest of the time, and A1 hex just before the "file not found" error. Incidentally, what does PRINT ERRS\$ (print DOS error message) give you after BASIC's "file not found" error? If you have a few minutes, I'd appreciate the results very much. Thanks!

Fm Joe Kyle-DiPietropaolo: Adam, I think that Roy suspects the *IP problem to be internal to the 1773. Myself, I still don't like the looks of that "ready plus something else I forget without my book handy" line connected to that floppy support gate array chip.

Fm Adam Rubin: Joe, That line is "Ready" (output from FDC) or "Enable Write Precomp" (input to FDC).

I side with Roy on that one. An early report on the troublesome HDBOOT said that there were no problems if there was **something** in floppy :0 that returned an index pulse. An unformatted disk was fine. A 6.x disk with the index notch covered over was not.

The 4P boot ROM sends a "restore with verify" to floppy :0, and the FDC in the GA machines would never go "un-busy" unless there was an index pulse (one? five? nine? don't know how many it wanted) on that drive, or that drive was already at :0.

In any case, did you realize the 4P was warranted for (I think) 90 days against defects in materials and workmanship, but no time limit was given for defects in design? (Heh heh heh...)

Fm Joe Kyle-DiPietropaolo: Well, the next step, I'd say, is to get a 1770 and a

1772. Bend up pin twenty on the 1770 chip (careful, this isn't a forty pin DIP) and stick the chip in so that pin 20 is a no-connect. The machine should boot and run fine, but won't have any pre-comp on write, so don't try writing. If that works, re-do the \$FD driver so that it uses the chip's internal pre-comp capability. Run the infamous torture test and see what happens.

If it works fine, do a new version of 6.3 that turns on both the chip precomp and the "old" precomp, the only side-effect should be loss of side compare on half the disk, no biggie. If that is unacceptable, do a special version for the 1770/1773 only and package a new FDC chip with it as an upgrade.

Note that if this works, we haven't actually proved that it is in the 1770 or in the GA floppy support chip, since we have replaced both, but if it works, who cares?

The 1772 should work identically, except that it is available in a -02 version that has an enhanced data separator, and provides faster step rates (2, 3, 6 and 12 ms). Handy for drives that like to step at 3 ms.

I don't have a GA machine, so I can't test this myself. Any volunteers?

Fm Bob Haynes: Adam, Finally got around to trying that modification you requested. Here's my current variation on Roy's test program:

```
10 ON ERROR GOTO 100
20 FOR I = 1 TO 10000
30 PRINT CHR$(29); "FDC
Status: "; HEX$(INP(&HFO))
40 PRINT "Iteration "; I;
50 OPEN "I", 1, "TEST/DAT:1":
CLOSE 1
60 FOR J = 1 TO 10000: NEXT
70 NEXT: END
99
100 PRINT: PRINT: PRINT "Final
FDC Status: "; HEX$(INP(&HFO))
110 PRINT: PRINT "ERRS$ = ";
ERRS$
120 RESUME 130
130 END
```

And here is the result of today's run:

```
FDC Status: A0 Iteration 332
Final FDC Status: A0
ERRS$ = 24-File not in directory
Ready
```

As you guessed, FDC status before iteration 1 can be anything; in my case (since I've created a floppy boot disk just for this test), I always get 0, but a break in the program and rerun can give most anything in the MS nibble. What is most interesting is the "Final FDC Status" always seems to be A0, not A1 as you expected. Do you see anything in the program that may have skewed the results?

Maybe the FDC "busy" (bit 0) you are looking for is timing out before the INP can get to it? Toss another routine my way if you like; I'm terrible at interfacing / ASM to BASIC.

Fm Adam Rubin: Joe, Replacing the 1773 with a 1770 or 1772 is an interesting suggestion. (I don't see how that would get rid of the floppy support GA, though.) I'll have to think about that for a while. Unfortunately, all I have is one NGA 4P, so we'd still need a volunteer for the project.

Fm Adam Rubin: Thanks for trying that modification to the FDC "torture test", Bob. There goes that theory, I guess. I'll have to think about that some more and see what the next step would be.

I apologize for the delay in replying, but this is rapidly becoming an extremely busy semester. (Among other things, I have to write a multiprocessing operating system in a high-level language.) I'll still be reading all public messages in this forum, though, and replying to as many as I have the time for.

**Doubling; SS-PRO drivers;
UPS'; etc**

Fm Carl Berger: Dear Roy, Could you please send me a patch to LS-DOS 6.3 TED/CMD to make it work like the LDOS 5.3 TED/CMD when <BREAK> is pressed while in the insert mode? The LS-DOS 6.3 TED leaves the cursor fat like it's still in the insert mode after pressing <BREAK>, but it is no longer in the insert mode,

I was very intrigued by your article on the doubling of files in TMQ IV.i. I have seen this happen on my 4P about 3 times since I got the 4P in 1983. My 4P has no modifications except for the 128K memory upgrade that was put in by Radio Shack shortly after I got the 4P. I think the first time it happened was right after using the 4P in TRSDOS 1.3. When I put a TRSDOS 6.x disk in drive 0 and pressed reset there was clunking noise coming from drive 0 and when I finally got into the Model 4 mode I found 2 copies of SYSTEM/JCL on drive 0. I assumed at that time that I did something wrong or rebooted from the wrong screen. Years later after installing a 40 meg hard drive I found another duplicate file name on a logical drive. I removed it and figured that same program did it somehow, but never knew how it could happen. I have also found a text file in BOOT/SYS causing BACKUP to abort until I either copied another BOOT/SYS to that drive or reformatted that partition. I have had no such problems now for a long time, but I mention them now after reading Charles Ainsworth's statement that he never heard of anyone else having that file doubling problem.

I have a question that I have never asked before and I am very curious to know the answer. Over the years I have seen reference to Gate Array computers and Non-Gate Array, PAL computers. I want to know what my 4P is. Did I read correctly in TMQ that a 26-1080 is a PAL machine? My 4P is Model 26-1080, Serial Number 002324, purchased in 1983 when they first came out. Is my 4P definitely NOT

Gate Array, and what are the other ways of telling them apart with and without disassembling the computer?

Does anyone out there have a ScripsitPro printer driver for the Epson FX-80 Printer? I have a Radio Shack DMP-200 at home, which is supported, but my office has an Epson and I was hoping I would not have to figure out how to write my own driver for it.

Has anyone come across the program named CHECKER/CMD written in 1984 by Mike Orr? The program checks every file on the drive you specify by reading each file and counting it's records and reporting any errors it encounters during the read. I like the idea of CHECKER/CMD but it only allows drive numbers 0, 1, or 2 to be entered. I can't use it to check my floppy disks in drive 7. So if anyone knows how I can reach Mike Orr, or if you have CHECKER/CMD and can tell me how to modify it to read any drive from 0 to 7, I would appreciate it.

Yesterday at work, I was moving files around on the hard drive and I found that a tiny 1 record text file that was created by TED/CMD had 10K bytes allocated to it. I listed it and there was at least 1 other unrelated program appended to it. I removed the text file and went home. Now I wonder if another file is going to be missing or trashed? What would cause a text file to get attached to another file? Was an EOF marker missing? If so, where did it go?

The system I use at work is a 128K green CRT 4P hooked to a 15meg Radio Shack hard drive configured as 6 logical drives with the 2 floppy drives as drives 6 and 7 running under LS-DOS 6.3 using PowerSoft RSHARD drivers.

On 4P power supply problems: When my 4P power supply started hiccupping when I turned it on after it was off for a couple of days, I just stopped turning it off! My 4P has been running 24 hours a day for years. I just turn off the hard drive when I'm not using the computer. By the way, I have the 4P, hard drive, modem, and printer plugged into a Clone SPS-300 stand by power supply to eliminate those annoying power failures we have here in

Florida during our thunder storms and even when the sky is clear. Does everyone, everywhere have power failures? Probably so. It gives a lot of peace of mind when I don't have to worry about losing a letter or program that I am writing because the power company switches generators when I'm computing!

One more question before I sign off this letter. I installed an SMDR board in the phone system at work which enables the phone system to send RS-232 serial data to a printer to keep a record of phone calls. I have an old Model III that I would like to use to capture the data on floppy disk. My problem is that I can't seem to figure out how to link the *CL to a disk file and to the *DO at the same time. I would like it to automatically run a /JCL that would make it all happen at power on and after power failures as I do not have an UPS at work.

Enter my vote for making TMQ into TMMM or TM3 (The Misosys Monthly Magazine). You could reduce the number of pages and increase the number of issues. You have a very nice magazine with real slick (no pun intended) covers. The main reason it took me so long to subscribe to TMQ was because I didn't realize it was the magazine that it is. I thought it was just a catalog of MISOSYS products.

Fm MISOSYS, Inc: Carl, The patch to TED/CMD in LS-DOS 6.3 was released on 2/1/87. What level is your DOS? I'm including a copy of the TMQ I.iii page which covered that page. Perhaps you ought to send in your master disk for a refresh. The charge is \$10 + \$2 S&H.

Your very rare instances of duplicate file names are probably not related to the currently recognized problem. If you're hardware was at fault, there would be many more cases. Of course, operating primarily in a hard drive environment, you would not be frequently exposed to the problem as it occurs only with floppies.

The other problems you noted are random events without any method of determin-

ing the root cause.

A 26-1080 is a PAL-based machine; a 26-1080A is a gate array. Perhaps I'll give a brief synopsis of the differences in a future TMQ. If you want to know a good deal about PALs from an entry-level standpoint, dig up a copy of BYTE magazine, January 1987. That had a series of articles covering PALs. Makes good reading. Gate Array chips are just a greater degree of integration and are typically mask programmed at the factory, although field programmable gate arrays are available.

Any file can appear to be "attached" to another file by a simple corruption of its directory record. With your experience with "extended files", you really ought to have a directory checker and mapper program. I personally would not just REMOVE a file that appeared too big; especially if the contents included some other file's contents. A directory checker, such as DIRCHECK - which is part of our GO:MTC package, would let you know if the directory was corrupt. It also can repair certain problems. Now how can these things get corrupted? Ever had a program crash? Ever had a program lockup? Ever had a power failure while the machine was on and executing a program? Any of these problems could cause corruption of data.

As far as others having power failures, yes, I'm sure a lot do. But from my experience, most folks do little about it but complain when there machine goes down. Some folks frequently write updated files to disk to guard against losing too much when a simple UPS or SBS would cure the problem. I addressed the subject of backup power in the summer 1988 issue of TMQ. Think many folks went out and did something about that problem? No sir! But I'm okay, I have a standby system on two computer systems. I just lose my phone system. But then, who wants to continue talking on the phone when the lights go out?

As far as the solution to your linking the *CL to screen, printer, and disk file, the solution is exceedingly simple. It just takes a little thought. Why not just bring up the computer and invoke COMM? Then you can either print and *FR to disk

while you still see what's going on. Sort of couldn't see the forest for the trees. COMM is more useful than just a terminal program.

As far as turning TMQ to a monthly? Forget it! I rarely have the time now to produce it every quarter. Don't forget, it's just me here. I don't have a "staff of thousands...". I'll stick to quarterly.

Incidentally, MISOSYS now sells PowerSoft's PowerDrivers: one is available for the Epson printer you mentioned.

TANDY DRIVES

Fm Walter P. Sullivan: I have been in the process of attempting to install a double sided drive in my Model 4 (26-1069) which is one of the original models of the 4's. I purchased a drive which when I tried to install it was too long for the space that Tandy sets aside for it's drives; furthermore the height dimension was 1.6" as opposed to Tandy's 3.38" which left some unoccupied space in the front of my computer. At this point I opted for a Tandy drive. In investigating this I was informed that Radio Shack does not install DD/DS drives in the Model 4, and the explanation for this was that the controller would have to be changed [editor's note: Not a true statement]. It was then suggested (on two different occasions) that I would be better off buying a Model 4D, which incidentally happened to be on sale for \$599. I still have the half height drive which I intend selling or whatever.

I was reading IV.i and saw that John D. Williams was able to accomplish what I had not. I would appreciate it if you would give me some information where I can get a drive without too much of a hassle or expense.

Fm Pete Granzeau: Walter, Look for a hamfest or computer show in your local area. Most any full height DS 40 track drive will suffice; I have a pair of MPI B-52Bs, for instance. You need to replace the drive connectors. If you look at the connectors on your cable, you will notice missing pins. One of the missing pins is required for side select, the others implement the drive address. Be sure the two replacement drives have their jumpers or switches properly set for motor on with drive select, and for the proper drive address, and that the outboard one on the cable (probably the one you put in the bottom slot) has the terminating resistor pack. You definitely do not have to replace the controller. You ought to be able to find serviceable used drives at a show for \$20 apiece. I did. You might be able to build your own drive cable if you want; three 34 pin edge connectors and somewhat less than 18 inches of 34 connector ribbon cable should suffice.

Modems wanted

Fm Hall Roberts: I would like to buy modems for two Radio Shack Model 4 computers. Does anyone have a used modem for a Radio Shack Model 4? I also need a terminal program to go with the modems. Please send me a letter on Easyplex if you are interested. My address is 70040,1000.

Fm Pete Granzeau: Assuming your Model 4 computers have the RS-232 board in them, you need no special modem; any "external" modem will work ("internal" modems are invariably intended for IBM PC or clones thereof). Any standard RS-232 cable (with a DB-25 male connector at both ends, wired straight thorough) will work. 2400 baud modems can be had for well under \$130. (I could have bought one—had I needed it—last weekend at a

computer show for \$115.)

Fm Bob Haynes: Folks, time marches on, especially while on-line, and if you're not running at least 1200 baud your connect charges have got to be way out of line.

Go for 2400 if you can manage it, but if not, the latest DAK closeout flyer shows their 1200 baud external Hayes-compatible modem clearance priced at \$49.90! (+\$6 s/h) This upgrade to your sys5 could pay for itself in a month!

The unit seems quite reliable; I've been running one for 2 years and I'm quite satisfied. DAK is a large well known mail order house in CA; they accept AMEX, VISA and MC.

Be sure to specify the offer #4955, the order-takers won't understand anything else.

Orders: 1-800-DAK-0800

Technical: 1-800-888-9818

Thoughtsome of you might like to know...

BACKUP and MOD flags

Fm James R. Pitney: Does anyone have a similar problem: When I do BACKUP :1 :2 (MOD) more than once, the second time I do it, nothing is updated! It always works the first time, but never the second. I'm really confused. (Using LSDOS6.3) Thanks for any help.

Fm Mark P. Fishman: James, If you haven't changed the disk in drive :1 when you do the second BACKUP :1 :2 (MOD), nothing will be copied to drive :2 because

all the MOD flags on drive :1 were reset by the first BACKUP. If you want to backup the same (modified) files to more than one copy, you have to write-protect the diskette first, so the flags don't get reset.

The MOD flag tells the system (or you) that a file has been changed or is new since the last time BACKUP was run. After you run BACKUP on a diskette, there are no longer any files marked as MODified.

I hope this is clear. In other words, this is a feature, not a bug.

Fm Shane Dawalt: James, The MOD switch in BACKUP tells the operating system to backup any files on drive 1 which have been modified since the last backup. The first time you invoke this command, all modified files are backed up as you expect. After each file is backed up, the MOD flag (which denotes the file as being modified) is reset by the operating system. Hence, when the backup is completed, all files on drive 1 are "unmodified". When you invoke the BACKUP :1 :2 (MOD) again, nothing is done because all files on drive 1 are "originals" and have not been "modified".

Fm James R. Pitney: Mark and Shane, Okay- thanks for that info. I had been under the impression that the disk being written to was the one had had the flags set, not the one from which the file was being backed up. So, (please correct me if I'm wrong), when the file is modified on a disk, the mod flag is set. Once I run BACKUP, the mod flag is reset. Yes? And then, the following question ensues: when the file is backed up to the new disk, is that file marked as modified or not? Thanks again

Fm Pete Granzau: James, BACKUP leaves all the files it has moved with the flag off (which sounds reasonable), on both the sending and receiving disk. I keep two backup disks, and usually do it

this way:

BACKUP :2 :3 (MOD)

(change the disk in :2 at the end of BACKUP)

BACKUP :3 :2

An image backup of even a DS 80 track drive is quicker than a by-file backup of more than a couple of files. Doing it that way gives me an immediate check on the readability of the first backup disk, as well.

Fm Bob Haynes: Jim, the BACKUP command turns off the mod flag on both source and destination files if backup of that file is successful. When looking at a particular disk, the idea is to ask for each file, "Does a backup exist for this particular file?" If you're looking at the source disk, the answer is yes, on the destination disk. If you're looking at the destination disk, the answer is also yes, on the source disk. Thus disabling the mod flag, which implies "there is NO backup for this file" is appropriate on both ends.

If you don't like this arrangement, do a "SYSTEM (DRIVE=x,WP)" command on your source drive before performing BACKUP. (where x is your source drive #). Do a "SYSTEM (DRIVE=x,WP=OFF)" afterwards. You could stick them in JCLs for convenience if you like. Examples: "DO WPOFF", "DO WPON"

Fm Frank Slinkman: James, When you do a DIR of a disk, look for the "+" sign by the file name. This tells you the file has been modified. After you backup those files, DIR again, and you'll note all the "+"s" have disappeared.

BASIC and cursor on/off

Fm Danny C. Mullen: There's a bug in BASIC 1.01.01 that came with my LS-DOS 6.3. I tried to do PRINT CHR\$(15) to turn off the cursor - doesn't work. Tried my original 6.3 disk to double check - no work. I tried my 6.1 version of TRSDOS BASIC 1.01.00 and that command works. I thought this occurred previously, but didn't follow up. Are there any patches that I missed? I have all patches up to Level L+, but there's no differences. Has anyone else experienced this? Will send disk later, if necessary.

Fm MISOSYS, Inc: Danny, BASIC does indeed turn off the cursor when it processes a "PRINT CHR\$(15);" statement; you just don't realize that at the command level, BASIC turns it on again for the prompt! Try coding that statement within the body of a program. You'll see that while the program is running, the cursor is OFF. When the program stops and BASIC emits its prompt, the cursor is turned back ON. That's a design feature.

Fm Danny C. Mullen: Roy, Right you are! About CHR\$(15) in BASIC - I thought it worked like old version in command mode. Sorry for the trouble. The problem I had is in GBASIC from MicroLabs.

In a future TMQ, would you consider explaining the 'OPREG' port bits? These and their manipulations baffle me. Especially when I look at the Radio Shack Technical manual, The select bit 1/0 and Fix Up memory, memory bit 1/0 etc., with no explanations.

Fm MISOSYS, Inc: Danny, If you look at the Radio Shack HARDWARE portion of their TECH MANUAL, you should see a figure which identifies the specific memory mapping associated with various configurations of (SEL1,SEL0) and

(FXUPMEM,MBIT1,MBIT0). The OPREG port is used to establish a particular configuration. Spend some time and analyze that portion and you will eliminate the "baffle". Of course, you should not need to bother with any of that unless you are writing your own DOS.

System slots in Directory; Old clock patches

Fm Henry A. Blumenthal: Dear Mr. Soltoff, I received your 20-meg hard drive this week. It's now on line, fascinating me and challenging me as I work my way through understanding its software and hardware.

I have a continuing problem in Model III (LDOS 5.3) mode; I cannot get LDOS to post a date and date that are anything else than garbage. This is true whether or not I use an LDOS disk that has been SYSGENed to recognize the hard drive, and whether or not the hard drive is even turned on! It's as though there is something in the drive hardware that is sending a bad signal to the I/O bus or shorting out some critical pins. Sample screen dumps are enclosed. You can see in one instance where I have entered a time, even on a disk that knows nothing about an online clock, only to see the time become garbage. The uneven margin on the printout is due to the fact that one of the LDOS disks has forms parameters set with an eight-character margin and the other one doesn't.

There is no such problem whatever in Model 4 (LS-DOS) mode.

When I first powered up the hard drive, I couldn't get the computer to read the clock and could not get the drive to format, so I knew that I didn't have a firm cable connection, I had to wiggle the

connection behind the drive repeatedly before I got satisfaction, so you might want to look at the workmanship in this area. Since the clock works fine in Model 4 mode, I doubt that the connection problems I had would have any bearing on my continuing problem in Model III mode. What do you think?

Next; I have two outboard floppy drives that I am not been able to enable when the DOS disk is SYSGENed for the hard drive, using the HD20INIT option without parameters. (I elected to keep DOS files off the hard drive in order to save precious directory slots, and I SYSRES=2, 3, 10 and 12 to speed up operations.) Here is my setup: only hard drives :2, :3, and :4 are enabled in LS-DOS mode, as :5 contains LDOS files. Likewise, in LDOS mode, :2, :3, and :4 are unavailable and only :5 is enabled, How can I get DOS to recognize the two outboard drives in both DOSes, and have them designated as :6 and :7 in LS-DOS and as :2 and :3 in LDOS? If I need to alter HD20INIT/JCL (giving it a different file name, of course), where do the changes need to be made in each DOS version to put floppies :6 and :7, or :2 and :3 in the case of LDOS, on line, and will running an altered initialization cause loss of data on the hard drive?

Next: Because directory slots are limited, I know that I am going to have to use your SubDISK routine if vast chasms of the drive aren't to remain vacant. But I am having trouble visualizing how to go about it. Knowing my configuration, please lead me through the steps of emulating a standard 40-cylinder, SSDD disk on, say, drive 0 and doing a straight backup of a data disk to it from drive :1. Then show me how to work on and update a file on that emulated disk, copy that file to the floppy so that the floppy will be my backup, then get out of that emulated disk so that I can do other things. At present I have a "disk" on drive :3 with 184,576 bytes available and I don't know what to do next. (Which brings up another question: Can a SubDISK be renamed?)

Next; I have Level J of LS-DOS (CS# 14927). What does Level L fix? Anything that might be a factor in some of my problems?

I'm sure you will solve my problems in your usual enlightened way. Knowing that you probably are swamped with questions like mine while trying to meet promised shipping dates, I hope that you nonetheless can give me priority attention because of the nature of my problems.

Meantime, I love the speed and convenience of the hard drive, as I knew I would. I was holding out for one with a clock, and you came through (at least in Model 4 mode).

Fm Henry A. Blumenthal: Dear Mr. Soltoff, I want to follow up very quickly on my letter of October 14, detailing my problem with garble in LDOS date and time (which, in my haste, I called "date and date", but I'm sure you knew what I meant.)

I'm beginning to suspect that every single copy of LDOS 5.3 that I have has a blown SYS file. I suspect this because I tried a 5.1 version, and it did not give me the garbling. And you will recall in my previous letter that SYS3 would not patch. Might that be the file that carries the time and date software?

I am pleased to report that I did figure out at last how to evoke the SubDISK routine; it's quite ingenious; I'm sorry to have bothered you on that one. I kind of wish now I'd formatted the drive to include the system tracks, but I won't want to lose everything I've done by starting over, which I suspect I would. I can't [have] more than four SYS files in SYSRES without some programs balking.

However, my problem with the cable connection to the hard drive persists! I don't know if the cable has an intermittent contact or the drive does, but it's a pain in the neck. Snapping the side clamps in place pretty much ensures that the connector won't make solid contact.

In addition, I still haven't solved the problem of re-enabling my two outboard floppy drives. (I assume, however, that I would have to disable one of them whenever I wanted a SubDISK.)

And my question also stands as to the adequacy of Level J of LS-DOS.

Here's a fresh question: I see IFC4 as ideal for backing up modified files to floppies, because the mod flags can then be turned off, so that I can keep track of what's been batched over and what hasn't. I want to buy it, but I don't need another thing that comes on the same disk, because I already have them in one form or another from other packages. What would you charge to sell me that one utility, along with a copy of the repaired LDOS SYS track (if indeed that's the problem?)

I look forward to your responses, and hope that you aren't so super-efficient in handling your correspondence that you already had answered my previous letter. Chalk it up to a learning experience.

Fm MISOSYS, Inc: Henry, This is in response to your letter of October 14th and its followup on October 17th which was received today.

Be aware that after about the first 20 drive units were shipped, I have been testing all cables 100%; in fact, a \$1200 Cirris Systems cable tester was acquired to perform a more exhaustive test than would be performed just by trying out a cable between a hard drive unit and a computer. However, intermittent problems may go unnoticed because I don't perform a "wiggle" test of each connector. I have not had any further reports of cable problems except for yours; your unit was shipped after cables were being 100% tested. In any event, I'm sending you a replacement cable. Please return the "bad" cable so that I may evaluate it. A return address label and postage is provided for the return.

Any problem with reading the clock in Model III mode of LDOS 5.3 must be attributed to a problem with your copy of the DOS. One thing to look out for, though, is that the patch to SYS3 must be applied to a system disk which is other than the current drive :0. You could switch to the hard drive; patch the boot floppy; switch to the boot floppy; then patch the hard drive. If the patch does not apply without

error, something is wrong. If you continue to have a problem with the Model III mode, send me a backup copy of your LDOS master disk for me to evaluate. If you want to go ahead and get your master refreshed, send that disk; the charge is \$10 + \$2 S&H for a disk refresh.

In order to enable your external drives, you need only employ a function which is documented in your LDOS manual. To enable drive :6, for example, try the following:

SYSTEM

(DRIVE=6, DISABLE, DRIVER="MOD3")

At the driver prompt, enter a "3" to select the first external drive. Then all you need do is to SYSGEN the result onto your BOOT floppy, the same way you sysgen'd the hard disk. Since you may want to use drives :6 and/or :7 for subdisks, you may just want to keep a Job Control Language file handy which will install both external floppies, or either one based on a menu query.

If you want to establish a six-partition setup, all you need do is to add some more lines in the existing HDxxINIT/JCL file and revise the number of cylinders being requested. If you spend a little time to evaluate and understand the current JCL, you will have no trouble in adapting it to your needs. I have found from experience that the more choices I give, the more folks become confused. So best to learn a little about the current job stream if you really want to differ from the "default" setup.

I gather from your second letter that you have installed system files into memory using the "SYSTEM (SYSRES=n)" command. Running with a hard drive, the performance of system overlay access is sufficiently fast that I would recommend that you avoid installing any system overlays into memory. It's easy to redo your configuration by starting from scratch with the HDxxINIT/JCL file, but **DON'T SPECIFY FORMAT.**

I'm enclosing a page from issue L.iv of *THE MISOSYS QUARTERLY* which covered the patches from level H to level K (level L is just the nomenclature for a

level K but patched by LSI). Nothing in it is a factor relative to any problems you are having.

Finally, although IFC is an excellent tool, I don't unbundle it from the GO:CMD package. That package is well worth the cost. If you choose not to obtain it, bear in mind that BACKUP turns off the "MOD" flags after copying a file; and you can instruct BACKUP to copy just files with the mod flags set by using the (MOD) parameter. Consult your DOS manual for assistance.

Fm Henry A, Blumenthal: Dear Mr, Soltoff, Here is yet another follow-up to my previous letters spelling out my problems with LDOS. Apparently the problem is with my LDOS 5.3 disks' inability to post the time and date, and for the life of me I don't know how it happened, unless something from your hard drive or related software has zapped them. I had no problem until I installed your drive! Only a coincidence? Also, I did NOT patch any system disk while it was in floppy drive 0.

As you can see from the enclosed, LDOS reads the hard drive's clock just fine through MCLOCK5 but not through its own time and date commands.

Also, do you have an explanation for my inability to put LDOS system files on the hard drive so that I can sysgen over to it? (See second enclosure.) I was able to do so without difficulty with LS-DOS since my last letter to you, and I see nothing in the manual that suggests I cannot do the same thing with LDOS. — but maybe I can't? Do certain cylinders on the destination disk have to be free? I notice there is no swap command in Model III mode, either. What was originally labeled hard drive 5 is disabled in Model 4 mode and is the only hard drive enabled in Model III mode on the hard disk, and floppy drives 1 and 2.

I look forward to getting my LDOS problems resolved.

Fm MISOSYS, Inc: Dear Henry, This is in response to your letter of October 19th concerning further "clock" problems under LDOS.

My October 20th letter specifically stated, "If you continue to have a problem with the Model III mode, send me a backup copy of your LDOS master disk for me to evaluate." Obviously, you have not received that letter yet so I will render no further comment concerning your clock problem. Obviously you need to send me a copy of your Model III DOS disk.

Incidentally, you may want to explore not using the clock patches in the Model III mode until you get the problem straightened out. I cannot imagine that you have tried to just turn off the date and time prompts and used an invocation of MCLOCK5 to read the date and time as discussed on page 44 of the MSCSI operator's manual because you never mentioned that in any of your letters. You may just have something different with your LDOS disk making it incompatible with the patch. Without seeing your disk, I cannot comment further.

Both LDOS and LS-DOS require certain directory entry slots to store the directory entries for the DOS overlays. The difference between the 254 maximum entries available on a data drive and the 240 available on a system drive are the 14 additional reserved slots for SYS0/SYS through SYS13/SYS. When you format a disk drive, neither LDOS nor LS-DOS reserves the system "slots". If you move files to a data drive, it is possible that one or more of the "system slots" will be used to store the directory information for the files so moved. It is then impossible to create a system drive on that disk unless you remove the files occupying those necessary slots. This appears to be the case with your drive.

One solution is to copy to another disk the files which occupy those positions, then remove the interfering files. It's easy to know which files are the offending ones by a simple examination of the directory. The directory can occupy up to 34 sectors: the first is the Granule Allocation Table (GAT); the second is the Hash Index Table (HIT), the third through last

contain directory entries for up to 256 files. Since the system entries are in the first eight sectors containing directory entries, it is sufficient to examine those. Try listing the directory to a printer with the command,

```
LIST DIR/SYS:d (P,H,R=2)
```

It is only necessary to list the first eight sectors printed with this command so you can <BREAK> after record 0009 has been printed. Each entry occupies two rows of data in the listing. If you examine the rightmost eleven characters in the first of each pair of rows, it may contain a file name and extension. Make note of any non-blank specifications. There also exists a single bit in the first byte of each entry's data record which indicates whether that directory record is active or inactive. If you know anything about hexadecimal, bit four of the first byte will be a "1" if the record is active. For invisible non-system files with no protection, the value for an active file is typically a 10H. Look at the first two row pairs in each of the first eight sectors on the printout. For any file specification you see, that is a file you should copy to another disk then delete. If you don't know hexadecimal, don't worry; if you try to copy a file that is inactive you'll just get a "File not found" error.

After you eliminate any file whose directory entry conflicts with the system slots, you should then be able to BACKUP the floppy system disk to the hard drive. Alternatively, you could purge all files on that drive then BACKUP the DOS then restore the purged files, but it is not necessary to remove all of them.

Just to re-emphasize one point, both LDOS and LS-DOS behave identically in this feature. The reason was to provide an additional 14 directory entries on all drives but system drives; the restriction was that you had to create the system drive before you started moving non-system files to it.

Fm Henry A, Blumenthal: First, I want to acknowledge receipt today of the cable. I will return the old one in a couple of days after I see whether the old one will continue to stay put, now that I have found,

through trial and error, that the righthand side looking at the drive housing from the rear) should be pushed in slightly farther than the lefthand side. After a little tugging, I was able to get it to clamp in that position. I want to make sure once and for all that it's the cable and not the drive hardware.

Just today I traced down the problem of the date and time garble in LDOS — and this is something you might want, to alert your customers to: You may recall from earlier correspondence that I was using an Alpha Products Newclock 80 clock and calendar board. One of the command files that came with it ensured, if invoked, that the computer would continue to read the clock and not drift with I/O use. Well, when I reconfigured the machine to handle your hard drive and its clock, I did not know that a previous sysgen operation had "read" that command file into the configuration! So what I had were two competing clockreading operations going on! When I realized this, I did a system (sysgen=no) to clean out all previous residue, rebooted, and just started all over again, re-entering cursor shape, printer filter, etc., from scratch. At long last I'm in business — except that I still cannot patch the SYS3 file in LDOS; I still get a find error. According to the directory, SYS3/SYS shares the same date as the other unmodified system files, I take it that you have received no other complaints about inability to patch that file?

It's ironic that, having removed one file that ensured clock accuracy, I can't replace it with another.

Thank you for your reminder that mod flags can be removed on backup; unfortunately, that doesn't work with a straight copy command, which is preferable for me as all files being backed up don't go to the same diskette; that's why IFC4 would be nice. We'll see...

To answer another point in your letter: I am no longer using SYSRES in Model 4 mode, now that I have gotten LS-DOS system files over to the hard drive. But I still have not done so in Model III mode. Unlike the Model 4 LS-DOS version, the Model III LDOS version won't let me copy the system files — "directory slots

in use!" — to the hard drive. In LDOS mode, I have all hard drive partitions disabled except for the last, and that's where I want to put the system files, if LDOS would let me. I guess I should have exercised the "dual" option, way back when I was first formatting the hard drive — but would it have worked, since that drive is not a part of the LDOS configuration???

(In Model 4 mode, all partitions are enabled but one, and I have made drive 3 a tiny partition — an emulated floppy put on line by sysgen.)

I read with interest the portion of your letter that said I could carry several SD "disks" at one time. I have tried two; there is no problem other than a warning message that linkage has not been broken when I disable only one of them. Am I asking for corruption problems if I ask for three on line at one time?

Finally, thank you for your information on re-enabling outboard floppy drives; I should've known.

P.S. — There is a place on the front of the hard drive for a brand name; are you going to be coming out with one that we can stick on? The drive certainly deserves to carry the label MISOSYS!

Fm MISOSYS, Inc: Henry, I took the cable you returned and connected it up to my cable tester. I found absolutely no problem with the cable. I strenuously wiggled both ends of the cable while the connectors were plugged into the tester and under test. The cable exhibited no opens nor shorts; i.e. the cable is perfect. Since you returned it, I'll assume you had no problems with the other cable. If you do still continue to have a problem, the only other thing I can suspect is the cable assembly mounted on the cabinet which connects to the host adaptor. Keep me posted.

I'm glad you found the problem with the reading of the clock under LDOS, as yours was an isolated case. But then, you may be one of the few folks replacing an older clock with our newer one.

Although I'd love to sell you IFC4 as part

of the Golden Oldies: Command Utilities package, I still would be remiss in not telling you of another parameter in BACKUP which you should be aware of. If you want to copy only modified files but only to specific disks, just use the command,

BACKUP :s :d (OLD,MOD)

Only modified source disk files which already exist on the destination disk will be copied. BACKUP is much more flexible than most folks imagine; but you have to at least look at the parameters. With that big hard drive on-line now, there's no excuse for not having the DOS/HLP help facility instantly available.

I also previously wrote you as to why you cannot put LDOS on that hard drive partition which already had files on it. That has nothing to do with the "dual" parameter of the MSCSI installation JCL.

Only the number of free logical drive slots limits the ability to having subdisks on-line. If you had only one hard drive partition active, you could have seven subdisks. But in order to recover the sub-disk linkage used to establish a connection to a subdisk after you disable a particular subdisk, you have to disable them in an order reverse of what you used to establish them. Personally, I don't see the point of needing many active at one time, but then, I probably use my machine differently than you.

That rectangular area can be used for a label. But since I had no hopes to sell thousands of drives, I didn't bother to get a label printed. Trying to use an internally label generated from an in-house printer just wouldn't cut it.

SYS3CLK5/FIX dated 09/15/89

Once I had become aware that applying the patch to the current system disk would result in a problem, I changed one comment line in the fix file emphasizing a drive specification, and added another line clearly indicating not to patch the current system drive. These two lines are:

```
. Apply via, PATCH SYS3/
SYS.SYSTEM:d SYS3CLK5
. BUT NOT TO THE CURRENT SYS-
TEM DISK!!!!!!!!!!
```

However, I forgot to take into account the fact that Model III LDOS uses a full colon ":" as a logical line separator. Thus, the PATCH utility treated the text following the ":" as a new line, and was quite confused from that point on. As an aside, LS-DOS uses a semi-colon ";" as the logical line separator.

Suffice it to say, all you need to "fix" the SYS3CLK5/FIX file is to edit it and delete the colon. After that, the fix can be correctly applied - but not to the current system disk.

After you apply the patch to some other on-line system disk, switch to that disk using the SYSTEM (SYSTEM=d) command then BACKUP SYS3/SYS:0 :d (S) to copy the patched SYS3/SYS file over to the original "current" system disk.

Sorry for the confusion this has caused, but the logical new line within the FIX comment caused a very imprecise error message to be generated.

Vacant Hash Index Table entries

Editor's Note: The following dialogue partly pertains to products from other companies. Although TMQ does not ordinarily include third-party letters, the discussion of whether or not a bug exists in LS-DOS would be confusing without a complete reading of the correspondence.

Fm H. L. Smith, Hobart, Tasmania, AUSTRALIA to Anitek Software Products, Melbourne, FL

Dear Sir, I wish to thank you for Model 4 LeScript V1.9 and the new manual which I received yesterday. V1.9 certainly has many new and worthwhile features. I have been busy experimenting with it!

Unfortunately, there was insufficient packing in the container and the last few yellow pages of the manual were damaged by movement of the binder. As well, the disk suffered minor external damage.

On examination of the directory of the disk using LS-DOS 6.3, I found that there were 2 copies of each of the files recorded! This is illegal under LS-DOS 6.3. Super Utility 4 reported a HIT error in the directory of the disk. After I allowed SU to repair this error on a copy of the master disk, all is well with the directory. However, LeScript won't load correctly. The program locks up the machine at the title screen. If the HIT error is not corrected, all appears well. The program loads correctly. However, an attempt to print using the K79 driver (or any other) results in the message: "CLOSE FAULT*DRIVE NOT READY*PRESS ENTER TO RETRY*BREAK TO ABORT". This message has been generated incorrectly, the drive and printer are ready. If BREAK is pressed the program loads the DE-FAULT printer driver, rather than (say) K79. Thus I have a corrupt master V1.9 distribution disk. (I encountered this error message with V1.80 before I received V1.81, though the reasons for it are probably different in the 2 cases.

I was very surprised to find that my existing versions of Electric Webster, Grammar and Style Checker and Hyphenator, were incompatible with V1.9. The Cornucopia ad and the product news in "The Misosys Quarterly" made no mention of this incompatibility. Although I want a working version of V1.9, what will you charge me to gain a copy V2.0?

I have also found that there are some differences between the file formats of V1.9 and earlier versions of LeScript. Is there a conversion program to convert between different versions of LeScript files?

A last query. Can LeScript VI.9/2.0 be patched for use with the Radio Shack hi-res board?

I would much prefer if a reply was sent by AIR MAIL as I urgently want to use LeScript VI.9/2.0 with all its wonderful features!

Fm Peter Ray (Anitek) to H L Smith: Dear Mr. Smith, The fact that TRSDOS 6 and LSDOS display each file name twice in the LeScript disk directory is in fact a bug in those DOS's. If you examine the directory sectors with Super Utility you would see that the file names are in fact only recorded once. The HIT errors are intentional (we put them there ourselves to keep locked out all unused directory entries), and should have no effect on ones ability to backup the disk or copy files from it. I can't guess as to why you are getting a "Close Fault Error" when trying to print, as we don't get such an error here. However, if you wish to send us an example on disk using the procedure outlined in the Trouble Report Form, we would be happy to check it out for you.

To get a copy of LeScript 2.00, the cost would be \$30.00, plus \$3.00 if the LeScript master disk is not returned, plus \$6.00 s/h.

There are only two types of LeScript document files: LeScript 1 document files and LeScript 2 document files (includes version 1.9). LeScript 1.90 and 2.00 will automatically convert LeScript 1 document files to LeScript 2 document files

when loaded in and saved back to disk. There is no method of converting LeScript 2 document files to LeScript 1 document files, other than saving them out of LeScript 1.90 or 2.00 in ASCII and loading them into LeScript 1.8.

There is no patch that could make LeScript 1.9/2.0 work with the Radio Shack hi-res board because those boards can't superimpose text and graphics.

Please let me know if there is anything more I can do.

Fm H. L. Smith to Anitek Software Products: Dear Mr. Ray, Thank you for your reply to my letter re "bugs" in LeScript V1.9. I originally used the LS-DOS 6.3 copy command to copy over the files that I required on my LeScript working disk. I have been able to show that the "Close Fault Error" is related to this method of file transfer. The fault did not initially occur if LS-DOS 6.3 BACKUP \$:1 :0 (MPW="") was used to copy required files. However, I have since seen the "Close Fault Error", intermittently, for no apparent reason.

I wonder if Roy Soltoff of MISOSYS knows of the "bug" in LS-DOS 6.3 that gives each file name twice in the LeScript directory? I am surprised that no mention of the "bug" is made with any of the documentation that came with LeScript V1.9. It is odd to see DOS attempt to copy the same files twice in one backup operation. Could you please be more specific as to the exact nature of the "bug" in LS-DOS 6.3?

I cannot get a directory of the master LeScript V1.9 disk using LDOS 5.3 (not LS-DOS 6.3). (A directory error is reported.)

I am still having printing problems with V1.9. On printing, using a Radio shack DWP-410 daisy wheel printer, and proportional space wheel, the underline is incorrect and superscript and subscript are not working. I suspect this is because of a bug in the K79 printer driver, or that the incorrect printer driver has been loaded.

To duplicate this fault, load V1.9 from the enclosed disk, use <CLEAR G> to load the file TEST/LS which is on the working V1.9 disk, and use <CLEAR P> to print the file. The result is attached to this sheet. I have also tried printing the FOOT-NOTE/TXT file that comes with V1.9. Although the K79 driver was specified (rather than k0), the wrong error message, "Printer Driver not Found" is seen. I would appreciate your advice.

Had I known that V1.9 is incompatible with my existing versions of Electric Webster (including Grammar & Style Checker and hyphenator), I would have specified V2.0 when I upgraded from V1.81. I have written to Cornucopia re upgrades for my Electric Webster disks, but I am pessimistic about getting a reply. Their customer service has failed to reply to me on previous occasions. Currently, \$A1.00 = \$US0.76, and I simply can't afford to get LeScript V2.0 as well as V1.9.

p.s. My LS-DOS 6.3 is unpatched. Password checking has not been disabled. Drives 2 and 3 have been enabled and the time prompt turned off.

Fm H. L. Smith to MISOSYS, Inc.: Dear Roy, Greetings from Australia! I wonder if you could find time to read the attached correspondence, to and from Anitek, who produce LeScript. My letter of August 20 should be read first, then the Anitek reply, and lastly my reply of September 16. If you could find time to write to me about the reported "bug" in LS-DOS 6.3, it would be greatly appreciated.

I have subscribed to "THE MISOSYS QUARTERLY" from the first issue, and I eagerly look forward to its arrival.

As of today's date, I have not received a reply from Cornucopia re upgrading my Electric Webster for use with LeScript V1.9. Past experience with them suggests that I will be unlikely to get a reply.

I have sent a disk to Anitek with instructions for duplicating the printing errors I am experiencing with LeScript V1.9. As mentioned, the "CLOSE FAULT ERROR"

is intermittent. I have no doubts that I will receive a reply from Anitek.

Fm MISOSYS, Inc: Dear Bert, This is in response to your letter of September 17th concerning your dialog with Anitek.

The message "CLOSE FAULT * DRIVE NOT READY * PRESS ENTER TO RETRY * BREAK TO ABORT" is issued when a program calls the @CLOSE routine to close a file and the DOS finds that the designated disk drive is not available. This can occur for two reasons: (1) the operator prematurely removed the diskette containing the file which was opened from the floppy; or (2) something corrupted memory causing the program to either incorrectly issue an @CLOSE or the open FCB was corrupted altering the drive number recorded for the file. In either case, it is not a bug in the DOS.

On the other issue of "2 copies of each of the files recorded", I cannot imagine what chain of events could cause that. Obviously, if that is a repeatable event with that diskette, kindly submit one for examination. I'd like to help out with a resolution of your problem, but the paper dialogue leaves me nothing to test.

Fm H. L. Smith: Dear Roy, Many thanks for your reply! I used "Copy Cat" to copy the master LeScript V1.9 distribution disk. Notice that each file name appears twice in the directory. (They say they have deliberately introduced a HIT error because of a "bug" in the DOS!) There has been no further response from Anitek. Nor have I received a reply from Cornucopia re upgrading my Electric Webster files for use with LeScript V1.9. My feeling is that Anitek is working on the bugs in LeScript V1.9 that I have uncovered. I'd love to read your comments!

Fm MISOSYS, Inc: Dear Bert, At last, I have the answer as to why you are getting double directory displays for the files on that LeScript disk. Sorry to break Peter's bubble, but whatever he is using to con-

struct the directory of that disk is incorrectly initializing the directory. From day one of the TRS-80 DOS releases, the Hash Index Table (HIT) is supposed to contain a zero when the corresponding directory record is inactive. I have never known a DOS to do otherwise; I don't know why Peter's LeScript disk has the inactive HIT entries filled with X'FF'. But it's wrong! Maybe that's what he is referring to as "intentional HIT error"

What happens is that the DIRectory command scans through the HIT looking for non-zero entries. When it finds one, it examines the corresponding directory record to see if that is active. Because all unused positions are non-zero, the directory command issues directory reads for non-existent sectors - sectors numbered higher on a cylinder than actually exists. However, the disk driver makes an adjustment to the sector number requested if it exceeds the number of sectors on a track. Thus, an attempt to read sector 18 (the 19th sector), actually results in a read of the first sector. Since the driver knows that the disk is not 2-sided, it doesn't attempt to select the second side of the disk (which isn't formatted, anyway). So because the LeScript disk has all unused HIT positions set non-zero, each sector in the directory is read twice: once for the HIT positions corresponding to sectors numbered 0-17, and once again for the HIT positions corresponding to sectors numbered 18-31. The second time around, the active directory records are again included in the directory listing. Since the listing is sorted, the entries are all alphabetized and appear twice in succession. If you set the (O=N) parameter, you will see the unsorted entries appearing as two successive lists.

If you want to cure the problem on that disk, just ZAP to X'00' all entries in the HIT which are a value of X'FF'; none of them are correct. I'm sending a copy of this letter to Peter so that he is aware of the problem.

Incidentally, LDOS would give you a directory read error as its FDC driver doesn't have the memory space to check if the drive is 2-sided after the sector number adjustment; it's trying to read the second side!

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EnhComp (\$59.95+\$4S&H): handles most of Microsoft BASIC; floating point single and double precision functions; random file access ("X" mode reclens to 32767), turtle graphics, pixel graphics, keyed array sort, multi-lined functions, user commands, REPEAT-UNTIL, line labels, and more. Built-in Z80 assembler to easily create hybrid programs of BASIC and in-line assembly code.

DSMBLR (\$24.95+\$2S&H): Direct disassembly from CMD disk files, automatic partitioning of output disk files, data screening and **full label generation**. It even generates the ORGs and END statement.

HartFORTH (\$49.95+\$3S&H): a **full 79-STANDARD FORTH**; is designed to **run under an operating system**. The virtual Memory that it accesses for storage and retrieval purposes is a normal DOS file supports double length integers, string handling, cursor manipulation, graphics, random numbers, and floating point.

STAMP/ASM

A program for generating a date/time stamp on printouts

Jane A. Layman
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Waukesha, WI 53186

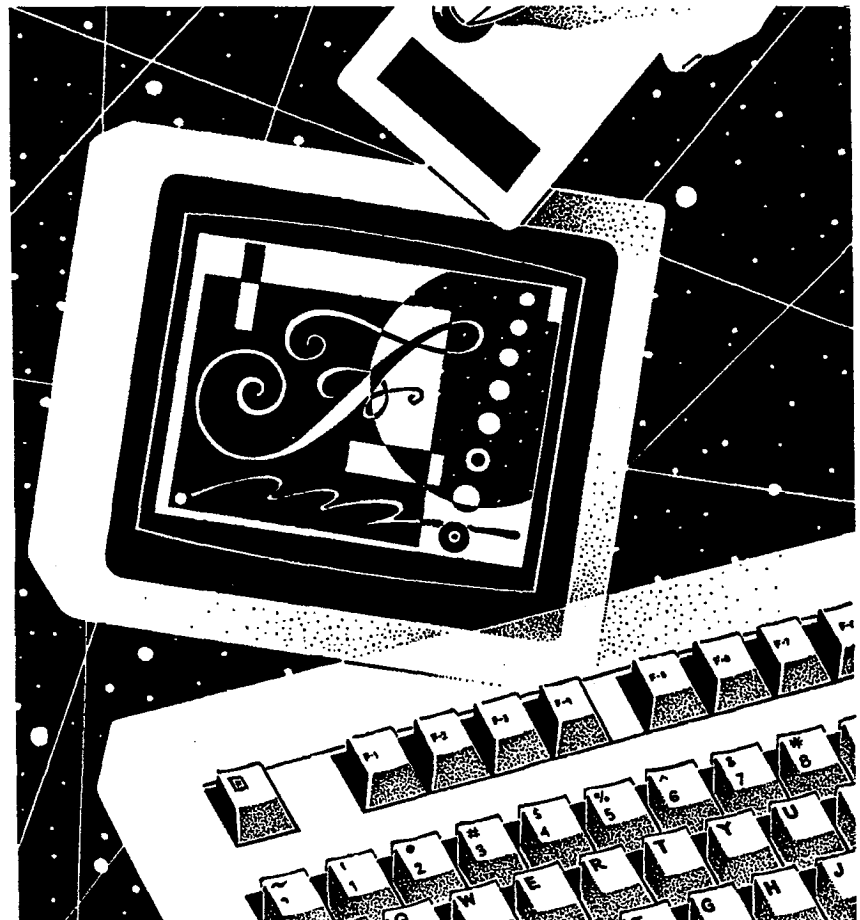
Please find the assembly source code for a short program I wrote called "STAMP", which I hope will be of interest to TMQ readers. It is intended as a convenient way to Date/Time stamp source code, documents, etc., that are sent to the printer. When STAMP is executed, it prints out the date and time the computer is set at on the first line of the paper.

The program has an optional parameter "Title" that allows the user to add a 30 character title (e.g., Error subroutine from MYPROG) to further identify the print out. STAMP runs in the DOS overlay area and does not change the Stack. Therefore, it can be used, for example, when block printing from SAID.

I was happy to see the FUNDATE program, among others, in the latest issue of TMQ. I needed a concrete example of how to save the system stack!

Fm MISOSYS, Inc: Thanks for the input, Jane. I took the liberty of making a few changes to your code. The big difference is in the method of testing for printer availability. I commented out the three original lines which checked the hardware printer port directly. That method would work only if a parallel port printer was being used. Other conditions where the test would fail to detect an "available printer" would be: (1) if a serial printer was in use with "ROUTE *PR *CL"; (2) the printer device was redirected to a disk file via "ROUTE *PR PRINT/TXT"; or

Applications for the User



```

;*****
; STAMP/ASM-by Jane A. Layman, September 1989
;
; STAMP sends the system date and time and an optional Title to the
; printer.
; It is intended as a convenient way to "stamp" any subsequent print
; out.
;
; USAGE: STAMP [The current date & time are printed.] OR
; STAMP (TITLE="Type 30 character title here") Abbreviation: T-TITLE
; [The date, time, and title string are printed on one line.]
;
; NOTE: The title string must begin AND end with a quotation mark.
; You may
; type more or less than 30 characters in the string without causing
; an error.
; In the case of more than 30 characters, however, only the first 30
; will be
; printed.
;
; STAMP loads in the DOS overlay area, and may be executed from
; within a
; program providing DOS command support.
;

```


(3) if the DOS spooler was in use via "SPOOL *PR ...". Because of these three cases, it is useful, in my opinion, to demonstrate to TMQ readers the best way to check for printer availability.

Those with a copy of The Programmer's Guide are directed to page 2-30 for a small discussion of the CTL-0 function of the *PR device.

**PRINTING FROM BASIC
OR ENHCOMP WITHOUT
CUTTING WORDS AT
LINE END.**

**PRINTING HEADINGS.
PAGE NUMBERS. ETC..
AND USE OF CUT
SHEETS.**

and

**PRINTING WITH JUSTI-
FIED RIGHT MARGIN.**

Charles A. Ainsworth
P.O.Box 2107
Woodbridge, VA 22193

I needed a program to input, sort and print out strings on model 4 with LSDOS 6.3; I could have handled strings and printout with a word processor which, however, won't sort, so I had to resort to BASIC and to MISOSYS' BSORT/CMD or DSM4/CMD for input, sorting and printing.

Word processors won't cut a word in two at line-end wraparound but a printout from BASIC will do so if the word straddles the line end set with the FORMS command, and I had to find a way to prevent such cutting. The strings I was handling varied from about 3 to 250 characters in length. I also wanted to add a heading and page number on each sheet.

If you want to go beyond the maximum string length of 250 characters I use, model

```

*****
;
CR      EQU      0DH      ; carriage return
PRPORT EQU      0F8H      ; Model 4 printer port
;
;
; LS-DOS SVC's
;
@DATE  EQU      18
@TIME  EQU      19
@PARAM EQU      17
@DSPLY EQU      10
@LOGOT EQU      12
@CTL   EQU      5
@PRT   EQU      6
@PRINT EQU      14
@GTDCB EQU      82
;
SVC     MACRO     #SVC
LD      A, #SVC
RST     28H
ENDM
;
;
; ORG      2600H      ; DOS overlay area
;PRCHECK IN A, (PRPORT) ; get value in Printer Port
; AND      0F0H      ; mask unused Positions
; CP       30H      ; PR ready?
PRCHECK PUSH HL      ; Save command pointer
LD        DE, 'RP'   ; Specify *PR device name
SVC       @GTDCB     ; Get DCB into HL
EX        DE, HL     ; then into DE
POP       HL         ; Restore command pointer
JR        NZ, NOTRDY ; Error if can't find it
LD        C, 0       ; Send CTL-0
SVC       @CTL
JR        Z, RDPARM ; If yes, jump to RDPARM
NOTRDY LD HL, MSG1   ; Else NOT Ready
SVC       @LOGOT
SEC       HL, HL     ; for exit
RET       ; return to calling program or DOS
RDPARM LD A, (HL)
CP        CR         ; optional parm present?
JR        Z, NOPARM ; no, go to NOPARM
CP        '('        ; look for '('
JR        Z, PARAM   ; yes, go to PARAM
INC       HL         ; see that there are no further
parameters
JR        RDPARM     ; loop back to beginning of RDPARM
PARAM LD DE, TITLE ; point to parameter table
SVC      @PARAM
JR        NZ, OPTPARM
LD        A, (RESP) ; get response code
AND      020H      ; test response flags
JR        NZ, SWAP   ; IF okay, go to SWAP
OPTPARM LD HL, MSG2 ; ELSE explain optional parameter
SVC      @DSPLY
LD        HL, MSG3
SVC      @DSPLY
SEC       HL, HL     ; for exit
RET       ; return to calling program or DOS
SWAP LD H, B
LD        L, C
LD        DE, TITLE$ ; Move user title to TITLE$
LD        B, 30      ; parse up to 30 characters
MOVTTTL LD A, (HL)
CP        ' '        ; or stop at closing quotation
marks
JR        Z, DATE
LD        (DE), A

```

```

INC      DE
INC      HL
DJNZ     MOVTTIL
JR       DATE
NOPARM   LD      A,CR          ; End HEADER after TIME$
LD      (SPACE$),A
DATE     LD      HL,DATE$ ; get current date
SVC      @DATE
TIME     LD      HL,TIME$ ; get current time
SVC      @TIME
PRINT    LD      HL,HEADER    ; point to HEADER string
SVC      @PRINT              ; and print it
LD      C,CR                ; put blank line between HEADER
and
SVC      @PRT                ; subsequent print-out
SBC      HL,HL              ; for exit
RET      ; return to calling program or DOS
MSG1     DB      'Printer not ready',CR
MSG2     DB      'Optional [and only] parameter TITLE, Abbreviation
T=TITLE',CR
MSG3     DB      'Example: STAMP (T="Type 30 character title
here")',CR
HEADER   DB      'Date: '
DATE$    DS      8
DB      ', Time: '
TIME$    DS      8
SPACE$   DC      5,' '      ; spacing between Date/Time and
Title
TITLE$   DC      30,' '      ; initialize with 30 spaces
DB      CR                  ; mark end of HEADER
; Parameter table
STR      EQU      20H        ; set string bit for parameter
table
ABR      EQU      10H        ; set abbreviation bit for table
TITLE    DB      80H        ; Table header code
DB      STR.OR.ABR.OR.5 ; See Programmer's Guide, p. A-188.
DB      'TITLE'
RESP     DB      0
DW      TITLE$
DB      0                  ; end of parameter table
END      PRCHECK

```

4 BASIC will stop you at its maximum of 255. However, if you need to go further, try MISOSYS' EnhComp compiler, which allows lengths up to 32767. With string lengths like that, you can really spread your wings and fly!

Workers who handle substantial volumes of printout probably use fanfold paper with a tractor, or some other autofeed system, but for those who read cut sheets by hand, I am showing how to arrange for a pause at sheet end for paper insertion.

Printing a heading on each sheet and/or stopping for manual paper feed, require a running tally of number of printed lines. I have covered two possible methods of doing this.

WARNING: The programs presented herein require the setting of certain parameters as described in the text; these parameters must be set before running the programs, otherwise unsatisfactory results will ensue.

METHOD NUMBER ONE

Printout without cutting words at line ends: stopping at page end for paper change and printing headings

Here is a demo program for model 4 and LSDOS 6.3, also usable under MISOSYS' EnhComp, discussed below under several headings; be sure you understand what NN, line 200, is about (discussed under "Adding headings...") before making a test run. This line includes all top-of-page features I built into my program, but you may wish to delete unneeded ones. I am adding, further on, suggestions on use with model III and LDOS.

PRTDEMO1/BAS

Avoiding word cutting: The demo program shows a method which will handle strings of any length and will print them out without cutting words at lineend wraparound. It does this by taking a portion, from the left of the string, that will fit in a preset line length and working back from the end of it towards the beginning until it finds a space, leaving the longest

Continued from page 53 of Applications

```

;
MEMFULL  DB      LF,LF
DB      'That file is too large to fit into'
DB      ' memory!',CR
;
MEMERR   DB      LF,LF
DB      'Memory error - use a RAM diagnostic'
DB      ' Program to verify.',CR
;
;-----
; Subroutine
BADSUM   LD      HL,15060+62 ; upper right corner
LD      (HL),'C' ; report checksum error
RET
;
;-----
; buffers
KBBUFF   DS      15          ; keyboard buffer
FCB      DS      32          ; file control block
DSKBUF   DS      256        ; disk I/O buffer
BUFFER   DB      0          ; text goes here
END      INIT

```

possible portion that will fit in that length without word cutting; it then prints out that portion and repeats the procedure, as many times as necessary, on any remaining portion of the original string.

Line 20 assumes that the printer paper is set to start printing at the correct place and sets the line counter (of which more later) to zero so as to begin counting lines correctly.

Lines 30 and 40 select AS at random (of one of four different lengths), from lines 300/330. There is a digit at the beginning of each string, solely to make it easier to follow on the printout when testing. This will enable you to make a test run, of any number of pages, without wearing away your fingers typing test strings. In a user's program, AS would of course be the input string, generated during program run, to be printed out.

The GOSUB 200 in lines 25, 70 and 90 is for checking the line counter to detect top of sheet and change paper and/or print headings, as explained later. Subroutine 200 may be changed to suit the requirements of each program, and is also explained further on.

The length of the printout on each line, which the program run may shorten slightly on individual lines to prevent word-cutting, is B in line 60, while the user may change to suit required printout parameters such as line length, paper width, margin and printer pitch. If A, the length of AS input at lines 300/330, is equal to B or smaller, AS gets printed out (line 70), the operation on that string is complete, RETURN is effective and the program jumps to 30 to get the next string.

If the length of AS is greater than B, the IF in line 70 tests as untrue and the program jumps to line 80, which examines the Bth character of the string (the 70th in this example). If it isn't a space (that's a single space between the quotes), then B is decremented by one and the line loops back on itself; this continues from right to left of the first 70-character portion of AS until a space is found, at which point the IF in line 80 is untrue (the character isn't different from a space, i.e., it is a space), and there is a jump to 90 which prints out

```
10 CLS:PRINT "PRTDEMO1/BAS, By C.A.Ainsworth, 11/88"
20 SYSTEM "FORMS (C=200,L=55,M=0)":LPRINT CHR$(6);
25 C=1:GOSUB 200
30 D=RND(4)
40 ON D GOSUB 300,310,320,330
50 GOSUB 60:GOTO 30
60 A=LEN(AS):B=70
70 IF A<B THEN LPRINT AS:GOSUB 200:RETURN
80 IF MID$(AS,B,1)<>" " THEN B=B-1:GOTO 80
90 LPRINT LEFT$(AS,B):GOSUB 200
100 AS=RIGHT$(AS,(A-B))
110 GOTO 60
200 IF PEEK(NN)=0 THEN PRINT "INSERT NEW SHEET
<ENTER>":LINE INPUT B$:CLS:LPRINT DATE$;TAB(30) "PRINTOUT
TEST";TAB(65) C:LPRINT:C=C+1 "CHANGE NN TO ACTUAL VALUE,
SEE TEXT!
210 RETURN
300 AS="1This is a test printout made by PRTDEMO/BAS pub-
lished in ":RETURN
310 AS="2This is a test printout made by PRTDEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, ":RETURN
320 AS="3This is a test printout made by PRTDEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, allows headings to be printed on each
sheet and stops at the end ":RETURN
330 AS="4This is a test printout made by PRTDEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, allows headings to be printed on each
sheet and stops at the end of each page for insertion of a
new sheet.":RETURN
```

the left portion of the string ending in a space, which is the longest string printable in 70 spaces without word cutting.

Line 100 makes AS equal to the unprinted right-hand portion of the original input string. Then 110 returns to 60 (still within the GOSUB 60 subroutine) to continue as before on the unprinted part and to reset B, which may have been decremented in line 80 on the previous round; all of which repeats until the remaining string portion is equal to or shorter than the reset B (i.e., 70) in line 70, when it gets printed and RETURN finishes with that string and exits from the subroutine.

The use of FORMS/FLT is mandatory in this system, at least to handle top-ofform printing as described under the next heading, and line 20 assumes it is installed. Ensure that the FORMS "C" parameter (characters per line) is large enough to prevent it undercutting variable B; otherwise the method would be defeated, as

"C", if shorter, would control line length instead of B, and there would be cut words. For demo purposes, I have set it at 200 (the maximum allowed is 255), probably sufficient to exceed most paper widths. I originally thought of setting it at the default, C=OFF, but that would return a DOS parameter error when setting the margin (margin without line length).

Watch for any possible problems on printers with platen width close to paper Width where the machine's built-in platen-end return might undercut the value set for B, so keep B below that limit. In summary, keep B in control of line length.

Within such constraints you can make B larger or smaller to obtain a different printout width, but be aware that if it were unduly small, line 80 would choke on a word longer than B as it wouldn't find a space; the resultant repeated decrements to B would eventually reduce it to zero producing an illegal function call error in

MID\$ causing a jump out of the program. Therefore, B should always be larger than the longest printed word, which should be no problem whatsoever in normal text at usual printout widths. Now, if you use unusually long words, you have to watch word length closer.

Certain sciences, chemistry for one, use very long compound words, such as names of complex formulations, which usually include commas or hyphens but may not include spaces. In such cases, you may decide on an additional acceptable line-end character such as comma or hyphen, and include it in line 80. For example, for hyphen:

```

80 IF
MID$(A$,B,1)<>" " AND
MID$(A$,B,1)<>"-" THEN B=B-
1:GOTO 80

```

The IF would then test true and loop back to 80 if neither space nor hyphen were found, but would test as untrue and jump to 90 for printout when either a space or a hyphen was found. If necessary, other or additional line-end characters could be added in a similar manner.

This arrangement would relieve the pressure on variable B as, now, it must only be larger than the longest word portion between a space and a hyphen, comma or whatever on such unusually long words.

You will, of course, set M (margin) and L (lines per page) in line 20 to suit your job.

Reading the above, the whole setup may seem very slow in operation; I find, in practice, it is faster than my printer so there is no noticeable slowdown.

Adding headings and page numbers on BASIC printouts: Many word processors will print headings, titles, page numbers, dates, etc. at the top of each sheet, but when it comes to BASIC printouts it's quite another matter. The question is how the BASIC program will know when the printer is at the top of the sheet so the heading, title or whatever may be printed. On the model III there was a memory location in the manual which could be PEEKed for line count (referred to herein later), but that vanished on the model 4.

But there is a way to do it on LSDOS 6.3, provided the model 4 FORMS/FLT is installed (DOS commands SET *FF FORMS/FLT and FILTER *PR *FF). There is a memory location (undocumented, I believe) one can PEEK to determine on what line number the printer is; I will call this location "NN".

In a simple and straightforward DOS configuration, without special demands on low memory, NN is probably decimal 4097. If you issue the DEVICE (B) command from DOS, with FORMS/FLT installed, you will find one item showing the printer linkage, something like this" *PR<#>[*FF] X'0FF4'. Convert that hexadecimal 0FF4 to decimal and you get 4084. Add 13 to get 4097, the location NN to PEEK.

In some DOS configurations, where certain items must go into low memory first, other items may get placed in higher locations and the above figures may change. For instance, in one setup I know of, with a MISOSYS XLR8er board installed, which requires a part of low memory for its own purposes (RAMDISK driver), the DEVICE (B) command shows the above location shifted from X'0FF4' to X'11BA' which converts to 4538 decimal, and adding 13 gives 4551, the NN location to PEEK. Another instance is MEMDISK which must be installed before certain filters or drivers, which pushes the latter into a higher location than they would otherwise occupy.

The value stored in memory location NN before you start printing is zero, unless it was left at another value from a previous job; you can reset both the counter at NN and the paper by getting BASIC to LPRINT CHR\$(12); (the semicolon is part of the command), or you can reset the counter without moving the paper by changing 12 to 6 in the command, which the demo program does in line 20. (You can also reset paper and counter from DOS with TOF.) Incidentally, it's a good idea to end any BASIC program involving printout with LPRINT CHR\$(12);, to eject the paper and reset the counter to zero. If you use certain tractors with fanfold paper, it might be better to use this LPRINT twice so as to eject the paper to the point where it is easy to tear off sheets. You may also

wish to close out your program with a reset of the FORMS parameters to your usual values.

The value stored in location NN advances by one for each line printed out. When the number of lines which have been printed on a page equals the value established when parameters were set with the FORMS command, FORMS/FLT issues a top-of-form to the printer which advances the paper to the beginning of the next sheet, which is precisely where you want to print your heading or title; at the same time, the value in location NN is reset to zero, which is your program's cue for top-of-form printing.

This allows you to include a subroutine in your BASIC program, line 200, so that each time a line is printed out, line 70 or 90 does a GOSUB 200; the same happens for line 25 but before any text has been printed, to take care of page 1; line 200 tests the value at location NN for zero and when the test is true the heading is printed (LPRINT DATE\$, etc.). You can include system date, page number, title, etc. Note that line length in the body of the printout may be adjusted by changing variable B which, however, does not influence the heading, whose width depends solely on the TABs used with LPRINT, which should be set to suit paper width, margin and printer pitch. The stand-alone LPRINT in 200 leaves a blank line between heading and text.

You will, of course, change the printout text in 200 to suit your own needs and "NN" to your actual decimal numerical value to PEEK. When the IF in 200 tests true and the date, heading and line number are printed, C is then incremented ready for the next page number; it starts out as i in line 25. If you don't need page numbering, omit references to C in line 200 and delete 25.

If you aren't interested in any of the features in line 200, simply delete 25, 200 and 210 and the GOSUBs in 70 and 90.

The above suggestions for finding location "NN" on the model 4 should enable you to use my method. However, if you were in doubt or wanted to see things clearer and get the feel of how this works,

you could test by first resetting line count to zero, from BASIC Ready, with LPRINT CHR\$(12); or LPRINT CHR\$(6); (again, the semicolon is part of the command; don't omit it, otherwise a line feed will sneak in and throw you one line off, perhaps causing much head scratching). For 11" long autofeed paper, have FORMS set up with lines per page at say 55, and your parser set to print about one inch from the top, Then clear BASIC with NEW and type in and run the following program:

```
10 LPRINT PEEK(NN):GOTO 10
```

where, once more, NN is replaced by your PEEK location, if you have the correct location, you will get a line-by-line printout from 0 to 54, then an advance to the next page when the PEEK will restart at zero. You will of course exit with BREAK. If you use cut sheets, you may wish to test by taping 8-1/2"x11" sheets together, or you could use a single sheet and issue a FORMS command for a shorter paper length and fewer lines per page.

See "Notes re PEEKing NN", below.

Using cut sheets: For those who hand-feed cut sheets into the printer, the program uses the first part of subroutine 200 (through CLS), which will prompt for a new sheet to be fed in manually and will stop at LINE INPUT, continuing when ENTER is pressed. CLS unclutters the screen for the next prompt. If you are a SOUND buff, you can insert the command as the next one after <ENTER> to also obtain an audible prompt. If you use autofeed paper, you won't need this portion of line 200 [but you will, of course, leave IF PEEK(NN)=0 THEN if required for the rest of the line].

See "Notes re PEEKing NN", below.

Printing double-spaced. So far, we have been talking of single-spaced printout. For double spacing, if you are using line 200, change GOSUB 200 in lines 70 and 90 to GOSUB 200:LPRINT:GOSUB 200. If you do not use line 200, insert LPRINT in place of GOSUB 200. If you have specified an odd number of lines for the L parameter in line 20, the resultant spacing will generate a blank line at the top Or bottom of a sheet; so in some cases, lines

may not be in the same position from one page to another, when you compare them side by side; but aPart from that, lines or pagination shouldn't be upset. If you want every printed line on each page in the same location, specify an even number of lines per page. In setting FORMS for lines per page, you would still reckon in terms of single spaces on a page, as the blank lines will also be counted the same as printed lines.

Use of the method with model III and LDOS. As stated, my program is for the model 4 with LSDOS 6.3, but model III LDOS users should be able to convert it with slight adaptation, bearing in mind that the PEEK location NN in line 200 should be decimal 16425 and that the value stored therein resets to 1 at top-of-form instead of the model 4 zero, so the beginning of 200 would change to: IF PEEK(16425)=1 THEN... etc.

See "Notes re PEEKing NN", below.

Notes re PEEKing NN. In the above uses of PEEK(NN), the PEEK at 200, originated by GOSUB in lines 70 and 90, takes place after each individual line is printed, even when a string spans more than one line, so a multiline string generates several PEEKs, one per line. If you were to attempt to use this PEEK system with some arrangement other than above PRTDEMO1/BAS, by printing more than one line between PEEKs (multiline string with one PEEK), you might miss a zero NN value (1 with model 3 LDOS) by jumping over it with a line that does not generate a PEEK, line 200 would not operate properly and top-of-form functions would be disrupted.

METHOD NUMBER TWO

Same as method number one but without use of FORMS/FLT

The preceding method, which I use on model 4 and LSDOS 6.3, uses a memory location which is PEEKed to detect the beginning of a page for headings and other top-of-page activities with FORMS/FLT installed, I feel this is very convenient as FORMS/FLT reliably counts lines

for us and all we have to do after every line is take a PEEK at the current line number, which saves us encumbering our program with line-count procedures.

However, there may be users of other DOSes or systems who don't have such an advantage, or who use other methods of forms control not compatible with the above, and who may want to introduce their own line count with no equivalent of FORMS/FLT installed. So here's another version of the program; before running any tests, lines 220 and 230 have to be edited to replace XX and YY with suitable numerical values, as discussed later. Also note information in the preceding program on setting other variables, such as B, line 200, etc.

It is assumed that you have read and understood the previous program before moving on to this one, as I shall only cover the differences here.

PRTDEMO2/BAS

The PEEKs used in the previous version have gone, and a variable LIN is introduced at 70 and 90 for counting printed lines. When the program run begins, LIN is set to zero at line 25 which then jumps to subroutine 200 (which now executes unconditionally as there is no IF in it) for top-of-form activities for page 1. When the GOSUB jump is made from 70 and 90, it is now to subroutine 220 which checks the value of LIN against XX, the desired number of lines per page. If these parameters are unequal, the RETURN in 220 takes us back to printout. If they are equal, the IF on 220 is untrue and a jump is made to 230 which issues a number, YY, of LPRINTs (blank lines) with a FOR...NEXT loop to take the paper to the top of the next sheet, then LIN is reset to zero and GOSUB 200 handles top-of-page functions. Line 210 then RETURNS to 250 which in turn RETURNS to the printout session in subroutine 60,

Variable XX in line 220 has to be replaced by the number of printed lines per page; if printing double-spaced, also include blank lines in the count; replace variable YY in 230 by the number of blank lines the

paper should be advanced for top of next page.

Here is a typical example of setting XX and YY for autofeed continuous paper: Assume 11" long paper printing at the usual rate of 6 lines per inch = 66 lines per page. You may decide to print 55 lines per page, which will give a shade less than 1" margin top and bottom. So set XX at 54 (we are counting from LIN=0, line 25). When LIN gets to 54, line 220 activates the loop in 230; the loop counter, one would think, should be set to 11 (55 printed lines plus 11 blank ones on 66-line paper); however, (as far as I can figure it out) a return sneaks in at the end of 230, so make YY one less, i.e., 10. Users of hand-fed cut sheets may set YY at whatever value suits them for proper page ejection, as the next sheet will be positioned manually whatever the value of YY.

Obviously, a number of lines per inch other than 6, a different number of lines per page or different paper lengths will require other values of XX and YY.

METHOD NUMBER THREE

Printing with justified right margin-monospaced, padding between words

This method provides right-margin justification on monospaced printout and is an extension of the general principles outlined for method number one, and may also be adapted to the line-count system of method number two by some slight changes. It is assumed that method number one (and number two if applicable) have been read and understood; only differences will be covered here.

There are probably various algorithms in existence for providing right-margin justification, some perhaps better than mine. In any case, mine worked for me. Ingenious programmers may think of improvements.

Right-margin Justification is usually a feature of word processors, but that does not make this a word-processing system. It is only meant for perfectly plain text without the fancy features of word proc-

```

10 CLS:PRINT "PRTDEMO2/BAS, By C.A.Ainsworth, 11/88"
25 C=1:LIN=0:GOSUB 200
30 D=RND(4)
40 ON D GOSUB 300,310,320,330
50 GOSUB 60:GOTO 30
60 A=LEN(A$):B=70
70 IF A<B THEN LPRINT A$;LIN=LIN+1:GOSUB 220:RETURN
80 IF MID$(A$,B,1)<>" " THEN B=B-1:GOTO 80
90 LPRINT LEFT$(A$,B):LIN=LIN+1:GOSUB 220
100 A$=RIGHT$(A$, (A-B))
110 GOTO 60
200 PRINT "INSERT NEW SHEET <ENTER>":LINE INPUT
H$:CLS:LPRINT DATE$,TAB(30) "PRINTOUT TEST";TAB(65)
C:LPRINT:C=C+1
210 RETURN
220 IF LIN<>XX THEN RETURN
230 FOR E=1 TO YY:LPRINT:NEXT E
240 LIN=0:GOSUB 200
250 RETURN
300 A$="1This is a test printout made by PRTDEMO/BAS published in ".RETURN
310 A$="2This is a test printout made by PRTDEMO/BAS published in The Misosys Quarterly. It prevents word splitting at line ends. ":RETURN
320 A$="3This is a test printout made by PRTDEMO/BAS published in The Misosys Quarterly. It prevents word splitting at line ends, allows headings to be printed on each sheet and stops at the end ":RETURN
330 A$="4This is a test printout made by PRTDEMO/BAS published in The Misosys Quarterly. It prevents word splitting at line ends, allows headings to be printed on each sheet and stops at the end of each page for insertion of a new sheet. ":RETURN

```

essors.

PRTDEMO3/BAS

Before going into details of this program, let's review some aspects of printout, which are probably familiar to experienced printer users but may be unfamiliar to relative newcomers. Note that I am not covering so-called laser printers with which I am not familiar and which may or not have points in common with my descriptions.

Methods one and two, as we have seen, scan text looking for a space, by taking the portion of the paragraph to be printed and working back from the targeted line length (70 in the examples) until a space is found, which provides the longest string printable in that line length without word cutting. That line is then printed. Obviously, it would be highly improbable for every line to be of the same length, which makes the right margin jagged.

In certain cases, a justified (uniform) right margin is desired for esthetic reasons. To see how this is attainable, let's take a brief

look at some of the factors involved. I said brief, inasmuch as a full analysis would be beyond my scope and many details are shown in printer and word-processing manuals which contain much valuable and helpful information on the subject.

Among the many features of modern dot matrix and daisy wheel printers, two are worthy of note: Monospaced printing and proportional printing. In monospaced, the printer can be set to operate at one of a fixed number of characters per line of printout, typically 12 pitch (pitch=chars. per inch), 10 pitch and often others. In proportional printing, this does not apply and the space taken up by each character is a function of its width, so that a narrow letter such as "i" occupies less space than a wider one such as "m" or "w". Naturally, one cannot talk of pitch of chars. per inch in this case as the width occupied varies according to which particular characters are printed.

In a dot-matrix printer the character size, type of font and space occupied by each letter are normally provided by the printer; in the case of daisy-wheel printers, a change of font means having to switch

printwheels, and perhaps a change in spacing so the typeface will agree with the spacing to produce a pleasing effect. A modern printer can be given operating instructions by setting switches on the printer and/or by codes sent to the printer from the program. In the case of a Basic program, operating commands for setting or changing printout parameters can usually be sent by statements like LPRINT CHR\$(a);CHR\$(b); (the semicolons are part of the command), where "a" is an escape code (often 27 decimal), which forewarns the printer that an operating code instead of a printable character is on the way, and "b" is a code number representing the actual instruction. Many manuals show printer control codes both in decimal and in hex. For use with the CHR\$() commands, the decimal codes are used.

An uninformed observer watching a machine print, may get the impression that a character is printed, the head makes a single jump to the next character, and so on. But there's really more to it than that. Many modern printers have a stepper type motor which advances the print head (via a belt or cable) according to instructions received from the electronics. Actually, every spacing operation is the aggregate of one or more of what manuals variously refer to as microspaces, dot columns, dot spaces or dots. These spaces are minute fractions of an inch. So when spacing, the head is moved a number of dot spaces as necessary. Those who are familiar with the innards of floppy drives will recognize the similarity with the stepper motor which moves the read/write head a minute fraction of an inch when stepping from track to track (which, for example on a 5-1/4" 80-track floppy, operating at 96 tracks per inch, means stepping 1/96" between adjacent tracks). It is this flexibility in spacing in small increments which allows printers to cope with a number of pitches and/or typefaces and with the resultant variety of spacing requirements.

Now back to right-margin justification: If the length of a line to be printed does not reach the desired right margin, a program can insert dot spaces to pad the line until it exactly reaches the margin. Dots can be inserted only adjacent to blank spaces between words (padded spaces) or they

```

10 CLS:PRINT "PRTEMO3/BAS, By C.A.Ainsworth, 2/89"
20 SYSTEM "FORMS (C=200,L=55,M=0)":LPRINT CHR$(6);
30 C=1:GOSUB 290
40 D=RND(4)
50 ON D GOSUB 310,320,330,340
60 GOSUB 70:GOTO 40
70 A=LEN(A$):B=70:E=B 'E=ANCHOR FOR VALUE OF B WHICH MAY
CHANGE
80 IF A<B THEN LPRINT A$:GOSUB 290:RETURN 'IF STRING FITS
IN LINE, PRINT W/O JUSTIFICATION
90 IF MID$(A$,B,1)<>" " THEN B=B-1:GOTO 90
110 G=E-B:IF G=0 THEN P#=0:F#=0:GOTO 210 'G=# OF BLANK
SPACES TO ADD FOR JUSTIFICATION. IF ZERO, GO STRAIGHT TO
PRINTOUT W/O CALCULATING DOTS
120 H#=0 ' # OF BLANK SPACES IN B CHARS. OF TEXT
130 FOR J=1 TO (B-1) 'FIND # OF SPACES IN B CHARACTERS OF
TEXT. -1 TO AVOID TRAILING SPACE
140 IF MID$(A$,J,1)=" " THEN H#=H#+1
150 NEXT J
155 IF H#=0 THEN P#=0:GOTO 210 'PROBABLY RARE CASE OF A
STRING B CHARS. LONG W/O ANY SPACES
160 K=G*12 ' # OF DOTS FOR JUSTIFICATION. ADJUST TO SUIT
PRINTER, SEE TEXT!
170 P#=INT(K):IF P#<K THEN P#=P#+1 'ROUND TOTAL # OF JUSTI-
FYING DOTS UPWARD, IF FRACTIONAL (PROBABLY UNLIKELY, BUT
JUST IN CASE!)
180 L=K/H# ' # OF DOTS PER SPACE, SING. PRECIS.
190 M#=INT(L) ' # OF DOTS PER SPACE, INTEGER (ROUNDS L DOWN-
WARD IF FRACTIONAL). WE CAN'T ADD FRACTIONS OF DOTS!
200 F#=P#-(M#*H#) ' # OF DOTS TO ADD, LOST IF WHEN L WAS
ROUNDED DOWN TO M#
210 FOR N=1 TO (B-1) '-1 TO AVOID TRAILING SPACE
220 C$=MID$(A$,N,1)
230 LPRINT C$: '(DON'T FORGET THE SEMICOLON!)
240 IF C$=" " AND P#>0 THEN GOSUB 350 'IF IT'S A SPACE AND
THERE ARE DOTS TO ADD, GO ADD THEM
250 NEXT N:LPRINT
260 GOSUB 290
270 A$=RIGHT$(A$, (A-B))
280 GOTO 70
290 IF PEEK(NN)=0 THEN PRINT "INSERT NEW SHEET
<ENTER>":LINE INPUT B$:CLS:LPRINT DATE$;TAB(30) "PRINTOUT
TEST";TAB(65) C:LPRINT:C=C+1 'CHANGE NN TO ACTUAL VALUE,
SEE TEXT!
300 RETURN
310 A$="1This is a test printout made by PRTEMO/BAS pub-
lished in ":RETURN
320 A$="2This is a test printout made by PRTEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, ":RETURN
330 A$="3This is a test printout made by PRTEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, allows headings to be printed on each
sheet and stops at the end ":RETURN
340 A$="4This is a test printout made by PRTEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, allows headings to be printed on each
sheet and stops at the end of each page for insertion of a

```

can be inserted both adjacent to blank spaces and between characters in words (padded spaces and characters).

On the various word processors I know, the trend is to pad only blank spaces between words on monospacing and both blank spaces and character spacing on proportional.

This method, number three, pads blank spaces only and is usable only with monospaced printing. If one wishes to justify proportionally spaced material, one can no longer use the present system which employs a character count as a measure of line length.

The program counts the spaces and distributes the dots over them alone. This means that if one is using a very narrow printout width, the additional spacing may become somewhat excessive as there is a greater chance that a long non-fitting word may get forced to the next line, and there are few blank spaces to receive a given number of padding dots (as also happens on a word processor). In extreme cases, for instance if you run the program with a line width, B, (program line 70) of 20 chars., you will find that the word "PRTDEMO/BAS" in the printout strings will occupy a whole line to itself and there will be a substantial amount of blank space to the right of it, to the extent that the margin will not be justified at all on that line as there was only one space to take all the dots. Such a case is an exaggeration for the sake of illustration, and may never occur in actual practice at usual printout widths.

Probably the reader who has understood method number one will be able to follow PRTDEMO3; however, here are a few points which may not be obvious:

Lines 130-150 scan the line to be printed, to determine the number of spaces (H%) over which dots should be spread (that's a single space between the quotes in 140). Line 160 calculates the total number of dots to be added, as a function of the number of characters backed in line 90, (G, line 110). Note carefully that the number of dots per char. (12 in the example) is entirely dependent on the printer and typeface and I have based mine on the

```
new sheet.":RETURN
350 FOR Q=1 TO M%
360 IF P%<1 THEN Q=M%+1:GOTO 390 'IF NO DOTS LEFT, CLOSE
    LOOP AND RETURN
370 LPRINT CHR$(27);CHR$(1); 'PRINT ONE DOT SPACE. CODES
    MAY BE DIFFERENT ON SOME PRINTERS
380 P%=P%-1
390 NEXT Q
395 IF F%>0 THEN LPRINT CHR$(27);CHR$(1);:F%=F%-1
400 RETURN
```

Tandy DMP430 manual, pages 127-128. This requires some explanation. Under "Dots per Line", the manual shows, for Compressed 12 CPI, a total of 1900. Under "Characters per Line", this typeface is listed as 158. Dividing total dots per line by total chars. per line gives us 12 dots per char. (as near as matters) which is shown in line 160 as a multiplier for G. Obviously, any other pitch, typeface or printer might require recalculation based on data in the pertinent manual.

Lines 180 and 190 calculate the number of dots to be added per space; when the result is fractional in line 180, it will be rounded downward by INT in 190, but that may leave us with insufficient dots. So we make up the number by adding the shortage starting at the beginning of the printout line (F%, line 200).

Lines 210-250 print out the line, character by character. Line 240 compares each character with a space and when a space is found, (and provided there are dots to add) GOSUBs to 350 which prints out the padding dots (M% dots per space). Line 360 checks the available (unused) number of dots (P%), and when there are no more, closes the loop by making the TO value of the loop one larger than on line 350 and then jumps to the NEXT instruction at 390 which will close the loop and exit cleanly without leaving any stray loop pointers in the system. Once the dot count becomes zero, by repeated decrements in 380, the P%>0 on 240 will test untrue and there will be no more GOSUB 350 for that particular line of printout. Line 370 uses LPRINT CHR\$(27);CHR\$(1);, to send one dot space to the printer each time the loop encounters it. Consult your manual; your printer may perhaps use some other code for this.

The dots in F%, line 200, are added at the

rate of one per space in 395 until exhausted. That means that however many dots are added per space by the loop in lines 350-390, there will never be more than one dot difference between the padding of one space (when F%>0) and another (when F%=0), which avoids large differences in width from space to space which might result from other algorithms for distributing dots over spaces.

You may think, as I did originally, that it would be simpler to round upward by making M% one higher in 190, saving ourselves the additional task of distributing, in line 395, the shortage, Fr, calculated in line 200. But if we did that the numbers may be against us. For example, assume that we have 14 spaces to pad with 72 dots, which gives L=5.142 in line 180. If we were to round that up to the next integer, we would get 6 dots padding per space. Line 360 would stop padding when the 72 dots have been used. The result would be that, of the 14 spaces, 12 have been padded with 6 dots each and two have not been padded at all, and the difference may be quite visible and even unacceptable to some persons.

Some operators type a double space after the period at the end of a sentence when about to begin another sentence in the same paragraph. Our program looks for a space as line terminator in 90, which is discarded in printout by (B-1) in 130 and 210. However, if there were another space there (at B-1 after line 90 has completed execution), the program will treat it as any other character and may print it out at a line end which would make the line appear shorter and the justification incorrect. If this were to cause any inconvenience, circumvent it by adding

```
100 R=B:IF MID$(AS, (B-1), 1)="" "
    THEN B=B-1
```


which would back up the line length to discard the additional blank space. Then change B in line 270 to R. The R in 100 will serve as an anchor for the value of pre-decremented B to be used in 270, to prevent the second space, avoided in 100, from being placed at the beginning of the continuation string in 270.

It is worth noting that two things are never justified. First, a stand-alone paragraph appreciably shorter than one line, if justified, could print out so widely spaced as to be ugly. For example, if one prints out with an 80-character width and a short paragraph of 20 characters, 4 words, is printed, that spread out to 80 would look strange indeed. Second, when a longish sentence or paragraph occupying more than one line is being printed and the tail end that goes on the last line is also short, that would be in the same situation. PRTDEMO3 avoids such things by having line 80 print out directly, without any attempt at justification, any such cases equal to or less than B characters long.

Admittedly, all the maneuvers the program has to execute don't make it a speed demon. If your printer is very fast, you may find the program lagging behind it at times, but if it isn't so fast you may not notice much difference.

METHOD NUMBER FOUR

Printing with justified right margin, with monospaced with both blank spaces and characters padded

Whether monospaced printing, when justified, looks better with only blank spaces padded or with both blank spaces and characters padded, is largely a matter of personal opinion. Some word processors seem to favor the former, but anyone who wishes the latter may play around with my program.

PRTDEMO4/BAS

This program is similar to PRTDEMO3/BAS but counts blank spaces and characters (PRTDEMO3 counts blanks only) and distributes dot spaces over all of them. The differences are slight and anyone who has understood PRTDEMO3 should be able to follow PRTDEMO4 easily.

```

10 CLS:PRINT "PRTDEMO4/BAS, By C.A.Ainsworth, 2/89"
20 SYSTEM "FORMS (C=200,L=55,M=0)":LPRINT CHR$(6);
30 C=1:GOSUB 290
40 D=RND(4)
50 ON D GOSUB 310,320,330,340
60 GOSUB 70:GOTO 40
70 A=LEN(A$):B=70:E=B 'E IS ANCHOR FOR B WHICH MAY CHANGE
80 IF A<B THEN LPRINT A$:GOSUB 290:RETURN
90 IF MID$(A$,B,1)<>" " THEN B=B-1:GOTO 90
110 G=E-B:IF G=0 THEN P%=0:F%=0:GOTO 210 'G=# OF CHARS. TO
    ADD FOR JUSTIFICATION
160 K=G*12 ' # OF DOTS FOR JUSTIFICATION, ADJUST TO SUIT
    PRINTER, SEE TEXT FOR PRTDEMO3/BAS
170 P%=INT(K):IF P%<K THEN P%=P%+1 'ROUND TOTAL JUSTIFYING
    DOTS TO NEXT HIGHER INTEGER IF FRACTIONAL (PROBABLY UN-
    LIKELY)
180 L=K/(B-1) ' # OF DOTS PER CHAR, SING. PRECIS.
190 M%=INT(L) ' # OF DOTS PER CHAR, INTEGER, ROUNDED DOWN IF
    FRACTIONAL
200 F%=P%-(M%*(B-1)) 'RECOVER DOTS LOST IF/WHEN L ROUNDED
    DOWN TO M% (ADDED IN 395)
210 FOR N=1 TO (B-1) '-1 TO AVOID TRAILING SPACE
230 LPRINT MID$(A$,N,1); 'PRINT CHARACTER
240 IF P%>0 THEN GOSUB 350 'IF THERE ARE DOTS TO ADD, GO
    ADD THEM
250 NEXT N:LPRINT
260 GOSUB 290
270 A$=RIGHT$(A$, (A-B))
280 GOTO 70
290 IF PEEK(NN)=0 THEN PRINT "INSERT NEW SHEET
    <ENTER>":LINE INPUT B$:CLS:LPRINT DATE$;TAB(30) "PRINTOUT
    TEST";TAB(65) C:LPRINT:C=C+1 'CHANGE NN TO ACTUAL VALUE,
    SEE TEXT!
300 RETURN
310 A$="1This is a test printout made by PRTDEMO/BAS pub-
    lished in ":RETURN
320 A$="2This is a test printout made by PRTDEMO/BAS pub-
    lished in The Misosys Quarterly. It prevents word split-
    ting at line ends, ":RETURN
330 A$="3This is a test printout made by PRTDEMO/BAS pub-
    lished in The Misosys Quarterly. It prevents word split-
    ting at line ends, allows headings to be printed on each
    sheet and stops at the end ":RETURN
340 A$="4This is a test printout made by PRTDEMO/BAS pub-
    lished in The Misosys Quarterly. It prevents word split-
    ting at line ends, allows headings to be printed on each
    sheet and stops at the end of each page for insertion of a
    new sheet.":RETURN
350 FOR Q=1 TO M% 'ADD JUSTIFYING DOTS
360 IF P%<1 THEN Q=M%+1:GOTO 390 'IF NO DOTS LEFT, CLOSE
    LOOP AND EXIT
370 LPRINT CHR$(27);CHR$(1); 'PRINT ONE DOT SPACE.CHECK 27
    & 1 FOR YOUR PRINTER
380 P%=P%-1
390 NEXT Q
395 IF F%>0 THEN LPRINT CHR$(27);CHR$(1);:F%=F%-1 'PRINT
    ONE DOT SPACE.CHECK 27 & 1 FOR YOUR PRINTER
400 RETURN

```

METHOD NUMBER FIVE

Printing with justified right margin and proportional. with blank spaces and characters padded

Here things get a bit more complex as we can no longer use the number of characters as a function of the desired line length as we did with monospacing. In proportional, number of chars. is meaningless as a measure of line length for justification, as there are several character widths ("i", "e" and "m" all have different widths, for example). So we can only work in number of dots and inches of desired line length, so we begin by setting line length in inches instead of number of characters.

Be forewarned that this program is far from fast; however, it might be a good port in a storm as it was for me when I needed it and had nothing better I could use.

PRTDEMO5/BAS

First, let's look at dots per inch of printout, used in lines 80 and 90 (200 or 240 dots per inch). My figures are based on a Tandy DMP430 printer; yours may be different and you should check your manual for appropriate values to use. For normal monospaced, i.e. non-proportional, 10 CPI (characters per inch) printout, my manual lists the maximum number of printable characters per line as 132 which means that my machine will print a maximum line length or $132/10=13.2$ ". Now, for proportional standard (a type size equivalent to normal 10 CPI), the manual lists 2640 dots per line. So if we divide 2640 dots per line by 13.2" of line, we get 200 dots per inch. Similarly, for what they call compressed proportional, a typeface of similar size to 12 pitch, we have 3168 dots per line. Dividing this by 13.2" gives us 240 dots per inch. Do not get confused by references to pitch or CPI here or in the program; I stated previously that pitch is meaningless in proportional; what I mean when talking here of pitch is the typeface/character size equivalent to nonproportional printout, but not the space occupied by each character.

In PRTDEMO4 we establish the desired line length with B in line 70. But now, in

```

10 CLS:PRINT "PRTDEMO5/BAS, BY C.A.AINSWORTH, 3/89"
20 SYSTEM "FORMS (C=200,L=55,M=0)":LPRINT CHR$(6);
30 PRINT "PRINTOUT IN PROPORTIONAL, JUSTIFIED, 10 OR 12
   PITCH":PRINT
35 PRINT "FOR DEMO PURPOSES, YOU MAY CHOOSE WIDTH AND PITCH
   OF PRINTOUT. MIN. WIDTH 3 IN. MAX. 12":PRINT
40 INPUT "PRINTOUT WIDTH, INCHES, e.g., 4.5":F:PRINT
50 IF F<3 OR F>12 THEN CLS:GOTO 40
60 INPUT "ENTER PITCH, 10 OR 12":R 'PROVIDED YOUR PRINTER
   ALLOWS IT ON PROPORTIONAL!
70 IF R<>10 AND R<>12 THEN CLS:GOTO 60
80 IF R=10 THEN S=F*200:GOTO 100 '200=DOTS/IN. FOR 10 PITCH
   PROP. S=DOTS FOR LINE LENGTH F. CALCULATE DOTS/IN. PER
   MANUAL, SEE TEXT!
90 IF R=12 THEN S=F*240 'CALCULATE DOTS/IN. PER MANUAL, SEE
   TEXT!
100 IF R=10 THEN LPRINT CHR$(27);CHR$(17);:GOTO 120 '27 &
   17 ARE DMP430 PRINTER CODES FOR REGULAR PROPORTIONAL; CHECK
   WITH YOUR MANUAL!
110 IF R=12 THEN LPRINT CHR$(27);CHR$(47); '27 & 47 ARE
   DMP430 PRINTER CODES FOR COMPRESSED PROPORTIONAL. CHECK
   WITH YOUR MANUAL!
120 D=ROUND(4)
130 ON D GOSUB 330,340,350,360
140 GOSUB 150:GOTO 120
150 A=LEN(A$):V=0 'V=PROGRESSIVE DOT COUNT
160 AF=0 'FLAG FOR A$ LEN
170 FOR T=1 TO A 'EXAMINE A$ FROM THE BEGINNING
180 E$=MID$(A$,T,1)
190 GOSUB 600 'CALCULATE DOTS PER CHAR.
200 V=V+W:IF V>S THEN AF=1:X=T-1:V=V-W:Y=S-V:T=A+1 'AS SOON
   AS WE HAVE EXCEEDED # OF ALLOWABLE DOTS, S, THEN BACK UP
   ONE CHARACTER AND EXIT FROM LOOP WITH T=A+1
210 NEXT T
220 IF AF=0 THEN LPRINT A$:RETURN 'IF WE HAVE NOT REACHED
   S, A$ IS SHORTER THAN TARGET LINE LENGTH, AS SHOWN BY FLAG
   AF, SO PRINT IT OUT WITHOUT MORE ADO. SIMILAR TO LINE 80
   IN PRTDEMO3/BAS
230 AA=Y+21 'DOTS TO ADD FOR JUSTIFICATION, INITIAL VALUE.
   +21 FOR LAST CHARACTER SPACE AND BLANK SPACE, SEE TEXT
240 IF MID$(A$,X,1)<>" " THEN E$=MID$(A$,X,1):GOSUB
   600:AA=AA+W:X=X-1:GOTO 240 'LOOK BACKWARD FOR A SPACE
   AND COUNT DOTS FOR CHARACTERS THAT HAVE BEEN JUMPED OVER IN
   DOING SO
250 AB=AA/(X-1) 'DOTS TO ADD PER CHAR. SINGLE PREC. X-1
   TO AVOID END SPACE
260 AC=INT(AB) 'DOTS TO ADD PER CHAR., INTEGER (ROUNDED
   DOWN TO NEAREST INTEG. IF FRACTIONAL)
265 AG=AA-(AC*(X-1)) 'DOTS TO RECOVER, LOST IF/WHEN AB
   WAS ROUNDED DOWN TO AC (ADDED IN 585)
270 FOR AD=1 TO (X-1) 'BEGIN PRINT OUT
280 LPRINT MID$(A$,AD,1); 'PRINT CHARACTER. DON'T FORGET
   THE SEMICOLON!
290 IF AG>0 THEN GOSUB 540 'IF THERE ARE DOTS TO ADD, GO
   ADD THEM
300 NEXT AD:LPRINT
310 A$=RIGHT$(A$, (A-X)) 'FIND UNPRINTED PART OF STRING AND
   START OVER WITH IT
320 GOTO 150

```


PRTDEMO5, we must work in number of dots, so lines 80 or 90 establish how many dots long our line must be (variables). We start out in line 150 and count dots from the beginning of the line (in lines 170-210); line 160 sets a flag, AF, which we will use later. We count dots at 190 with GOSUB 600 (more on this in a moment) until the count either gets to the end of our string by the loop terminating (T=A in 170) or until the dot count exceeds the line length (V>S in 200), whichever comes first. If it gets to the end of the string before it gets to the allocated number of dots, then flag AF will be unaltered by 200 and remain at zero and line 220 will print the string without more ado. If the count gets past the allocated dots per line, then line 200 will back one character (X=T-1) to set the number of dots occupied at or just below the allowable line length. Then line 240 looks for the first blank space in the string, similar to line 90 in PRTDEMO4. Every move that backs us away from the value of S dots keeps a count of the number of dots, until we get to line 250 which establishes the number of dots per character we have to add for justification. Line 260 converts the number to an integer, rounding down if fractional, and line 265 and 585 take care of the dots lost by any rounding down, same as lines 200 and 395 in PRTDEMO4.

Returning for a moment to line 200: After the target number of dots per line is exceeded (V>S), we establish the number of characters, X, by backing up one character from T with X=T-1, to get back within the allowable length, S. We also count back from V to deduct W, the latest increment to V, namely V=V-W. We are now a few dots (one character or a fraction of one) inside S. Now, on the principle, stated above, of counting the dots we go back from S, we have to count any dots skipped in moving due to X=T-1 and V=V-W, which line 200 does with Y=S-V, which returns a number of padding dots which get added to the calculation of AA% in line 240 by setting the initial value of AA% to Y in 230. We also add an extra 21 dots there to compensate for two things: The three spacing dots per character on the last character of the printout line and 18 dots for the blank space on which the string ends by finding a space in 240. Check these values with your own printer manual.

```

330 A$="1This is a test printout made by PRTDEMO/BAS pub-
lished in ":RETURN
340 A$="2This is a test printout made by PRTDEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends. ":RETURN
350 A$="3This is a test printout made by PRTDEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, allows headings to be printed on each
sheet and stops at the end ":RETURN
360 A$="4This is a test printout made by PRTDEMO/BAS pub-
lished in The Misosys Quarterly. It prevents word split-
ting at line ends, allows headings to be printed on each
sheet and stops at the end of each page for insertion of a
new sheet.":RETURN
370 'ASC 32/64:
380 ON ASC(E$)-31 GOSUB 520, 480, 490, 510, 510, 530, 530,
480, 490, 490, 530, 520, 470, 520, 480, 490, 520, 520, 520,
520, 520, 520, 520, 520, 520, 480, 480, 520, 510,
520, 510, 530: RETURN
390 'ASC 65/97:
400 ON ASC(E$)-64 GOSUB 530, 530, 530, 530, 530, 530, 530,
530, 490, 530, 530, 530, 530, 530, 530, 530, 530, 530,
530, 530, 530, 530, 530, 530, 530, 520, 490, 490, 490, 520,
530, 480, 530: RETURN
410 'ASC 98/126:
420 ON ASC(E$)-97 GOSUB 530, 510, 530, 520, 520, 520, 530,
500, 510, 530, 500, 530, 530, 520, 530, 530, 510, 510, 510,
530, 530, 530, 530, 530, 510, 500, 480, 500, 530: RETURN
430 'ASC 160/192:
440 ON ASC(E$)-159 GOSUB 520, 530, 530, 530, 520, 530, 510,
510, 530, 530, 530, 530, 530, 530, 530, 530, 530, 530,
530, 530, 530, 530, 530, 530, 530, 530, 530, 530, 530,
530, 530: RETURN
450 'ASC 193/223:
460 ON ASC(E$)-192 GOSUB 530, 510, 530, 530, 530, 530, 510,
530, 510, 530, 530, 500, 530, 530, 530, 530, 530, 530,
530, 520, 530, 530, 530, 500, 530, 530, 520, 530, 530, 530:
RETURN
470 W=8:RETURN 'CHECK W VALUES IN 470-530 WITH YOUR MANUAL
AND EDIT AS NECESSARY. W IS DOTS WIDTH OF EACH CHARACTER
INCLUDING 3 DOTS FOR SPACING.
480 W=10:RETURN
490 W=12:RETURN
500 W=14:RETURN
510 W=16: RETURN
520 W=18:RETURN
530 W=20:RETURN
540 FOR AE=1 TO AC% 'ADD JUSTIFYING DOTS TO CHARACTER OR
BLANK SPACE
550 IF AA%<1 THEN AE=AC%+1:GOTO 580 'WHEN NO MORE DOTS
LEFT, MAKE 'TO' VALUE IN 540 ONE GREATER THAN AC% AND JUMP
TO 'NEXT AE' IN 580 TO CLOSE LOOP CLEANLY
560 LPRINT CHR$(27);CHR$(1); 'PRINT ONE DOT SPACE. CHECK 27
AND 1 WITH YOUR MANUAL
570 AA%=AA%-1
580 NEXT AE
585 IF AG%>0 THEN LPRINT CHR$(27);CHR$(1);:AG%=AG%-1 'PRINT
ONE DOT PER CHAR. TO USE UP DOTS IN AG%. CHECK 27 & 1 WITH

```

Lines 190 and 240 use GOSUB 600 to calculate character widths in dots. This requires some explanation. Buckle up your seat belt, we are flying into a little turbulence!

Subroutines 600-640, and the subroutines they in turn call, are an attempt to split into bite-size chunks what might otherwise become something practically impossible to read, understand and maintain, even if writeable in Basic (remember that Basic has a maximum line length and all the numbers in 380-460 wouldn't fit on one line). Subroutines 600-640 in turn GOSUB to one of 380-400 as the case may be, depending on the ASC value of the character. Finally, subroutines 380-460 in turn GOSUB to one of 470-530 which establishes the dots width of each character.

Here's an example of how this works: Assume that line 180 has found E\$="A", which is ASC 65 decimal. Line 190 GOSUBs to 600, which tests untrue so the program falls through to 610 which tests true, so a GOSUB 400 is executed. Line 400 calculates ASC(E\$)=65, subtracts 64 and gets 1, so it executes the first GOSUB, 530, which tells us that the width, W, is 20, i.e., 17 dots for the character plus 3 for spacing. Now the RETURN in 530 takes us back to the RETURN in 400, which leads to yet another RETURN in 610 which transfers control to 200 for addition of W to V, the progressive dot count. Phew!, I hope you got that!

Admittedly, that's a long way around to go and rather slow; in fact, it seems like molasses in January at times; maybe someone will think of a shorter and faster way. Personally, I prefer this method to the others, despite its slowness, as padding in proportional seems very much less noticeable than in monospaced.

The character widths in lines 470-530 are from my DMP430 printer manual tables which show the dot measurement of each character (for my printer, these go from 8 to 20 in increments of 2 including 3 dots for spacing). Characters ASC 32 to ASC 126 (lines 600-620) are the ones most commonly used in English and perhaps would satisfy many users. I have, however, added ASC 160 to @23 (lines 630-

YOUR MANUAL

```
590 RETURN
600 IF ASC(E$)>31 AND ASC(E$)<65 THEN GOSUB 380:RETURN
'THESE 5 LINES DIVIDE CHARACTERS INTO 5 GROUPS FOR EASIER
HANDLING AND REASONABLE LENGTH "ON GOSUB"s IN 380-460
610 IF ASC(E$)>64 AND ASC(E$)<98 THEN GOSUB 400:RETURN
620 IF ASC(E$)>97 AND ASC(E$)<127 THEN GOSUB 420:RETURN
630 IF ASC(E$)>159 AND ASC(E$)<193 THEN GOSUB 440:RETURN
640 IF ASC(E$)>192 AND ASC(E$)<224 THEN GOSUB 460:RETURN
```

```
=====
; LOAD100, version 3.1
; Copyright 1988 by Mark Allen Reed
; for free distribution
=====
; Useful ROM and DOS routines
@KBCHAR EQU 002BH ; similar to INKEY$
@KBLINE EQU 0040H ; similar to LINE INPUT
@VDLINE EQU 021BH ; similar to PRINT
@CSIN EQU 0235H ; read byte from cassette
@CSHIN EQU 0296H ; read sync from cassette
@CSOFF EQU 01F8H ; turn off cassette motor
@FSPEC EQU 441CH ; put file name in FCB
@INIT EQU 4420H ; create new disk file
@CLOSE EQU 4428H ; close disk file
@PUT EQU 001BH ; write byte to disk
@ERROR EQU 4409H ; handle disk error
@ABORT EQU 4030H ; abort program
@EXIT EQU 402DH ; return to DOS
;
; Commonly used constants
CR EQU 13 ; carriage return
LF EQU 10 ; line-feed
ETX EQU 3 ; soft end-of-line
EOF EQU 26 ; end-of-file marker
;
; Pointer
HIGH$ EQU 4411H ; high memory pointer
;
; Macros
PRINT MACRO #MSG
LD HL,#MSG ;; set up for Printing
CALL @VDLINE ;; Print via ROM routine
ENDM
;
GETBYTE MACRO
CALL @CSIN ;; read byte from cass.
PUSH AF ;; store it temporarily
ADD A,C ;; add it to the checksum
LD C,A ;; return checksum to C
POP AF ;; restore original byte
ENDM
;
ORG 5200H
;
; Initialize the program
INIT CALL @KBCHAR ; get a character
CP 01H ; is BREAK pressed?
JP Z,@ABORT ; if so, abort processing
```

640) which include a number of special and foreign characters I sometimes use. The tables in the manual specify that the widths in dots are for the absolutely bare characters but that for practical use, three dots must be added to each for intercharacter spacing (which, of course, is a minimum which may easily increase as we Justify the right margin by padding with extra dots).

Lines 600-640 assume that only characters within these ranges of ASC values will be presented for calculation of dot values. Although I can't imagine anyone USING any ASC value outside these ranges, it might just be possible, in special cases, for a value to come along which isn't included. In such a case lines 600-640 would all test untrue and the program would fall through and end. Anyone likely to face such a situation might wish to add a new line, such as 650, to handle it as necessary.

Lines 380, 400, 420, 440 and 460, in specifying the ON...GOSUB deduct a fixed amount from the ON amount, such as 31 in line 380, 64 in line 400, etc. That may not need explaining for those who are familiar with ON...GOSUB; but for those who may not be accustomed to it, let me remind you that ON...GOSUB counts from 1 up and then goes to the corresponding subroutines in the line. As the first GOSUB on line 380, for example, is to 520, the statement will go to it on 1. Hence the need to reduce the ASC value of the character by 31 so the first subroutine in the line will be accessed by 32-31=1, the second subroutine by 33-31=2 and so on.

Lines 370-640 aren't in a very logical order [blush!], they are simply in the order in which the program came together, and some reorganization might make them clearer and easier to follow. If you do reorganize their sequence consider, as mentioned above, that the program might conceivably fall through all of what are now 600-640 and perhaps crash into the next line unless stopped by a trapping line or an END statement.

```

PRINT      TITLE                      ; else display title
LD          A,1
LD          (4211H),A ; select 1500 baud
LD          HL,(HIGH$)          ; get high memory pointer
DEC         H                    ; sub. 256 just in case
LD          DE,BUFFER ; get buffer pointer
OR          A                    ; reset the carry flag
SBC         HL,DE                ; and find the difference
PUSH        HL
POP         BC                    ; Put difference tn BC
LD          HL,BUFFER
LD          DE,BUFFER+1
LD          (HL),EOF
LDIR                     ; fill buffer with EOFs
LD          (HL),0                ; end buffer with a zero
LD          C,0                  ; clear checksum counter
;
; -----
; Read the cassette file header
RDHDR PRINT CASMSG                ; alert the user
CALL        @CSHIN                ; and read header & sync
GETBYTE                     ; read byte from cass.
CP          9CH                    ; is it a .DO file?
JP          Z,RDH10                ; if so, Proceed
CALL        @CSOFF                ; otherwise, turn it off
PRINT      CASERR                ; Print error message
JP          @ABORT                ; and abort the program
RDH10 LD      HL,(4020H)            ; get cursor position
LD          B,6                    ; Prepare to read 6 bytes
RDH20 GETBYTE                     ; read cassette file name
LD          (HL),A                ; and store it on screen
INC         HL
DJNZ        RDH20
LD          (4020H),HL            ; store updated cursor
LD          B,10                   ; ignore next 10 bytes
RDH30 GETBYTE                     ; read cassette file name
DJNZ        RDH30
CALL        @CSIN                  ; finally, read checksum
NEG                     ; negate it
CP          C                      ; compare it with ours
CALL        NZ,BADSUM ; alert user if different
LD          IX,BUFFER ; set up IX to read file
;
; -----
; Read the cassette file into memory
RDCASS LD C,0                      ; clear checksum counter
CALL        @CSHIN                ; read leader & sync byte
CALL        @CSIN                ; read byte from cassette
CP          8DH                    ; still a .DO file?
JR          Z,RDC10                ; if so, proceed
CALL        @CSOFF                ; else turn motor off
PRINT      CASERR                ; Print error message
JP          @ABORT                ; and abort processing
RDC10 LD      B,0                  ; read 256 bytes
RDC20 LD      A,EOF
CP          (IX+0)                  ; have we gone too high?
JR          Z,RDC25                ; no - keep going
CALL        @CSOFF                ; else turn motor off
PRINT      MEMFULL                ; Print error message
JP          @ABORT                ; and abort processing
RDC25 GETBYTE                     ; read byte from cassette
LD          (IX+0),A ; store in our buffer
CP          (IX+0)                  ; is it still intact?

```


LOAD100/CMD

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Soon after I bought my TRS-80 Model 100, I realized I needed some way to transfer files from it to my TRS-80 Model III. The conventional file transfer method — connecting the two machines with a null modem cable — wouldn't work because my Model III doesn't have an RS-232 port. The only thing to do was write a Model III assembly language program to read Model 100 cassette files and transfer them to disk.

LOAD100 reads any Model 100 cassette file that has been saved in ".DO" format. It strips out all excess line-feeds from the file as it loads. Then, after the cassette has been read, LOAD100 creates an ASCII file on disk suitable for loading into any text editor or word processor.

Be sure to run HITAPE/CMD from the "LDOS Ready" prompt before using LOAD100. If you don't, you'll spend several minutes staring at the sign-on message, wondering why nothing is happening. I know that from experience! You'll be amazed at how much more useful your Model 100 becomes once you're able to transfer its files to your Model III.

```

      JP      Z,RDC30          ; if so, Proceed
      CALL   @CSOFF           ; else turn motor off
      PRINT  MEMERR           ; Print error message
      JP      @ABORT          ; and abort Processing
RDC30 INC     IX              ; "bump" the Pointer
      DJNZ   RDC20            ; and continue 256 times
      CALL   @CSIN            ; read the checksum
      NEG    ; negate it
      CP     C                ; compare it with ours
      CALL   NZ,BADSUM ; alert user if different
      LD     A,(IX-1) ; look at last byte
      CP     EOF              ; end of file?
      JP     NZ,RDCASS ; if not, keep going
      CALL   @CSOFF           ; else turn off cassette
      PRINT  CASOK            ; print success message
;
; -----
; Write file to disk
WRDISK PRINT DISKMSG          ; Prompt the user
      LD     B,14
      LD     HL,KBBUFF
      CALL   @KBLINE          ; get 14 characters
      JP     C,@ABORT ; abort on BREAK
      LD     DE,FCB
      CALL   @FSPEC           ; put file name in FCB
      LD     HL,DSKBUF ; prepare for disk output
      LD     B,0              ; select reclen of 256
      CALL   @INIT            ; Open the file
      JP     NZ,@ERROR ; and Process any errors
      LD     IX,BUFFER
WRD10 LD     A,(IX+0) ; get a byte
      INC    IX              ; Get ready for next one
      CP     LF              ; is it a line-feed?
      JP     Z,WRD10          ; if so, skip it
      CP     EOF              ; is it an end-of-file?
      JP     NZ,WRD20 ; if not, all is well
      CALL   @CLOSE           ; otherwise, close file
      JP     NZ,@ERROR
      JP     @EXIT            ; return to DOS ready
WRD20 CALL   @PUT             ; store the byte on disk
      JP     NZ,@ERROR
      JP     WRD10            ; continue until EOF
;
; -----
; Messages
TITLE DB LF
      DB     'LOAD100, version 3.1',LF
      DB     '  copyright 1988 by Mark Allen Reed',LF
      DB     '  for free distribution',LF,CR
CASMSG DB 'Start the Model 100 tape...',LF
      DB     'Reading file: ',ETX
;
CASERR DB LF,LF
      DB     'That is not a Model 100 TEXT file!',CR
;
CASOK  DB LF
      DB     'The cassette has successfully loaded.'
      DB     LF,CR
;
DISKMSG DB LF
      DB     'Enter a disk filename: ',ETX

```

Continued on page 41 of Applications

EnhComp BASIC Compiler

EnhComp & DIM

Fm Michael Dauphin: Roy, The last TMQ mentioned that multiple DIM statements are not allowed in EnhComp. If multiple DIM statements cause problems, then it must be an obscure bug. Could it be that you are talking about reDIMensioned arrays and not two or more DIMs that allocate space for different arrays? Many of my Pro-EnhComp programs use Multiple DIM statements, apparently without ill effects. The only reason I use multiple DIMs is to keep the 'listings looking pretty' - no more than 80 characters a line.

Fm MISOSYS, Inc: Multiple DIMs will at some point cause a crash. It doesn't support them; unfortunately, it currently doesn't trap them. The culprit is that the compiler generates a code stream to deal with initializing some pointers associated with arrays. The compiler doesn't trap the fact that a DIM may have previously been compiled. Of course, it's not just the fact of compiling more than one DIM, it's **executing** more than one. Since arrays are allocated dynamically, its only at run time that the allocation occurs. This run-time allocation has a piece of initialization code which prepares the array table. If more than one DIM is compiled and then executed, the second DIM also has the initialization code which will mess up the previously allocated arrays. When I get the time, I'm going to fix that. But first I need to do a lot of leg work. The Model III and Model 4 compiler packages use totally separate sets of source files. That's because the assembler needed to generate the /CMDs and support library doesn't support conditional code. One day I'm

MISOSYS Products' Tidbits



going to add that support so I can re-group the source files into one set. Otherwise, it's a real headache ensuring that both sets of source files get the proper updates.

Pro-EnhComp & USING

Fm Michael Dauphin: Roy, this program shows a problem I have been having with Pro-EnhComp's USING. It seems to me that lines 50 and 60 should produce "0.006". I can live with the rounding error, but the 'extra places' in line 60

really mess up my output. - Mike P.S, I just checked my TMQ's (should have done that first) J.N. Grindley mentioned the same problem on page 62 of II.iv. I'm not sure if a fix for this was to be in release 2.6. You only mentioned a fix for the trailing space/hyphen problem.

```
10 CLEAR 1000 : XS = "##.###"
30 A! = .005 : B! = .005789 :
C! = .0005789
35 PRINT A!, B!, C!
40 PRINT USING XS; A!
50 PRINT USING XS; B!
60 PRINT USING XS; C!
```

```
Output
.005      .005789      .0005789
0.005      <= ok
0.005      <= Rounding error
0.000579   <= Too many dec places
```


Fm MISOSYS, Inc: I'll investigate and report back. Seems to me we covered that a long time ago.

Now after checking, what was covered was a fixup where certain powers of two would print incorrectly with a USING. That was discussed in TMQ I.iv (page 101) and corrected with a patch. But I think I overlooked Grindey's statement in TMQ II.iv (page 62) where he said, "while using the format '####.##-' if the number is 0 to the 2nd decimal place (i.e. 0.00345), that is what gets printed not 0.00." I tested your example and repeated the results; thus, there is a bug when using USING. I did note that using that same edit mask, if the number being converted was greater than or equal to 1.0, the conversion was correct. So the bug pertains only to numbers less than zero converted using an edit mask.

Because of the complexity of the SUPPORT/DAT code involved in the floating point to ASCII conversion under an edit mask, I have referred the problem to EnhComp's author while I continue to work on this TMQ issue. But I may not get a resolution in time for it to appear in print. It will be corrected for the next issue.

GOBBLER

Fm MISOSYS, Inc: The MISOSYS hard drive recently released has a joystick option. The joystick port provided with the option emulates the Alpha Products joystick, one quite common on the TRS-80 some years ago. As readers of TMQ know, access of the joystick port requires some specific coding on machines equipped with an XLR8er (see TMQ III.iv pages 42-48). Now that I have a joystick to use, I discovered that our GOBBLERJ pro-

gram (the one with the joystick support) will not work on an XLR8er equipped machine. Here's a patch, transparent to non-XLR8er equipped machines, to correct the problem:

```
. GOBBLERJ2/FIX - 11/07/89 -
Patch to GOBBLERJ/CMD
D0D,1C=F6 FF DB 00 2F E6 1F 28
0B 07 07 07 CB 7F
F0D,1C=DB 00 2F 4F 00 E6 1F 28
0B 07 07 07 CB 61
. Eop
```

Golden Oldies

Fm MISOSYS, Inc: While unremoving some files off of a hard drive I was playing around with, I came across a small bug in the GO:MTC UNREMOVE command. I don't know whether I was mixing up hexadecimal and decimal, but the problem was that UNREMOVE was supposed to be able to display a 22-long list of candidate files (16H) but the internal array space was allocated to support only 16 (decimal) entries. Either way, the only solution short of reassembly to expand the array space is to offer the following patch.

```
. UNREM61/FIX - 11/07/89 -
Patch to GO:MTC UNREMOVE/CMD
. Patch corrects display when
more than 16 deleted files
. can be unremoved. Apply via,
PATCH UNREMOVE UNREM61
D00,6F=E6 07 32 A9 36
F00,6F=32 A9 36 18 0B
D01,3E=10
F01,3E=16
D05,0C=31
F05,0C=30
. Eop
```

DIRCHECK & MISOSYS HD

Fm David Huelsmann: Roy, Another question about using your drive package (boy, I'm full of questions this last couple of days!):

When running DIRCHECK from the GO package, what hard disk option should be used? With just 'H', the GAT error for cylinder X'77' pops up. When using 'R', GAT Re-allocation -> Cylinder ddd Grand pops up but the re-allocations listed are for the same files, i.e., SYS0 is Re-allocated to itself. When using 'L', no errors are found. I am assuming 'L' is the correct choice?

Fm MISOSYS, Inc: Ah, process of elimination. But both R and L are incorrect. According to the documentation, I would suspect that H would be correct. I'll have to check the DIRCHECK code to see what it does for that. I would almost guess that perhaps H=0 would be the correct entry, but I'll have to check the source code, as the docs imply the parm to be (H) or (H=ON) which are equivalent to H=X'FFFF'.

Fm David Huelsmann: H=0 won't work as the program doesn't recognize zero as a valid entry. 1 is ok though. If I use 1 or even just H for the default, I still get the allocated but not used error for X'77'.

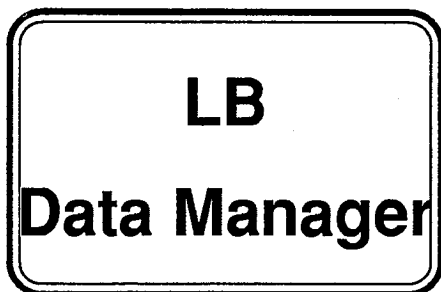
Fm MISOSYS, Inc: I checked the source code. It appears that the code is not necessarily correct for common drives. I never changed the piece of code dealing with the hard drive parameters ever since I took over the code from LSI because I never had any report of malfunction.

One thing the code does not do is pick up the actual directory cylinder and show it totally in use if the drive is a hard drive. In addition, the code does not properly check

for valid "H" parameters: an entry of H=TRUE (value of X'FFFF') is passed as legal even though it should be rejected. The value of H is used in DIRCHECK to pass the number of a maintenance cylinder. I suppose back when LSI generated the program, drives they were accustomed to used one. The piece of code which tests for a valid cylinder entry tests for a range of 1-202, but a value of X'FFFF' is sensed as no entry. The reason why you get a constant error on cylinder X'77' is because the code then erroneously falls through the test for the "L" parameter (that was for a Larado drive, remember them?). Larado always reserved cylinder X'77' for diagnostic purposes.

The end result is that entering an "H" as the parameter will always generate an error on cylinder X'77' until I can develop a fix. An "H" entry should imply that the drive under test is a hard drive and that the entire directory cylinder should be fully locked out.

Until a fix is developed, the work around is to pass the directory cylinder number as the argument of "H". So use DIRCHECK (H=dir) where "dir" is the cylinder containing the directory.



Fm John Tollini: Roy, I believe that I have run into a small bug in LB Beta 1.2. When attempting to create a sorted index file from the print module the sort fails with "must enter through LB" and drops out to LS-DOS Ready. The sort works fine when entered from "Select". Haven't noticed any other problems, but it sure

does load and switch between modules faster.

Fm MISOSYS, Inc: You're right. We overlooked testing for that problem (one of the purposes of a beta release). Seems that there was a label in the wrong spot in the code. I have a corrected copy of the LB 1.2.2 beta release. Not only did Rich fix that bug, but added a DOS shell capability to the main menu.

Anyone with a beta release of LB can send back their beta disk for a refresh to version 1.2.2 LB beta.

Fm Danny C. Mullen: Dear Roy, don't know if I included any future "wants" for LB, but two are: Ability to insert/delete in middle of field without re-typing whole line, and ability to backup to previous records during "add" mode to make minor corrections (would save time).

Fm MISOSYS, Inc: Danny, As far as LB is concerned, the two functions you are asking for are already in LB. "Using the Input Editor" is discussed in the installation manual. In the TRS-80 manual, that's page 7. It fully discusses how you can use <F1> to invoke insert mode.

Backing up to a previous record during an ADD operation is not as straightforward, but easily accomplished. Before you start your ADDs, turn on the ADD INDEX. This establishes an index file for the records being added. When you are finished, turn it off. If you want to edit any of the records you just added, go into the update function and use the ADD index. Then you can just step through until you find the desired record.

MISOSYS Hard Drive

SYS3CLK5/FIX

Fm Mike Harrow: Roy, Has anyone reported a problem applying the SYS3CLK5/FIX for LDOS 5.3. The patch utility starts then exits with the following message.

Reading input
D00,43=CD A1 50
FIND line mismatch

The strange thing is that when checking SYS3/SYS on the floppy using FED both of the F-format lines do match the file content. Any ideas? This doesn't make sense to me... should I suspect a bad copy of the PATCH utility?

Fm MISOSYS, Inc: There is no known error in the SYS3CLK5/FIX. What is needed is to ensure that the patch is applied to SYS3/SYS on something other than the current system drive; then switch system disks and patch the SYS3/SYS file on what was the current system drive.

As far as the error, I will rely on an old Peter Sellers line from one of the early Pink Panther movies (slightly modified): I suspect everything, and I suspect nothing.

Fm David Huelsmann: Mike, Had me going when I first tried it as well. Roy finally got me on track. The SYS3 patch is patching the @CLOSE vector to read the clock after every file close. Because the patch is quite long, it crosses a sector boundary at the end of the existing SYS3

code. Since SYS3 is the module that performs the @CLOSE and then updates the DCT and then the directory entry, it kind of makes sense that if you are patching it, it might have trouble handling its own CLOSE!

The solution is to patch another copy of SYS3/SYS. i.e., not the one residing on the system drive.

That should solve your problem (did mine <grin>).

Boot up on a regular floppy system - no hard drive involved. On your second floppy drive play another copy of LDOS 5.3. Now patch the SYS3 on the second drive. Assuming that works, boot up your floppy sysgened for hard drive and BACKUP SYS3/SYS:5 :0 (s) and do the same for your boot floppy. All should now be well.

Fm Mike Harrow: David, Ok will boot up in LDOS 5.3 and give it a try.... Just back from attempting the patch and here's the results.

Boot up using floppy which is sysgened for HardDrive. Automatically swapping Drive :0 :4. The HardDrive is now the system drive and floppy 0 is now Drive 4.

```
PATCH SYS3/SYS.SYSTEM:4
SYS3CLK5
```

Patch utility aborts with the Find Line mismatch error. Pulled out another system floppy put in drive 4 and tried patch again. Same error.

I've got to be missing something obvious but darned if I can see it.

Fm MISOSYS, Inc: Examine the SYS3/SYS file to see if any portion of the patch was previously applied. If PATCH says there's a mismatch, there is!

Fm Mike Harrow: David, This little problem is getting strange. The thing that

bothers me is that I'm able to patch sys0/sys on the data drive no problem. The FIND Line mismatch occurs only when attempting to patch sys3/sys.

I've successfully applied the Ls-Dos 6.3 patches (first try). Then booted up in LDOS 5.3 applied sys0clk5/fix without error. All attempts to patch sys3/sys with different variations results with the FIND Line mismatch error.

The final attempt (variation) was to dust off my old Model III. Insert a backup of my LDOS 5.3 Master. Use QFB to copy it twice. Boot up with 1st copy. Copy sys3clk5/fix to drive 0 (from MSCSI5 disk). Place 2nd LDOS 5.3 master copy into drive 1. Enter the command:

```
PATCH      SYS3/SYS.SYSTEM:1
SYS3CLK5
```

The same Find Line mismatch error occurs. HELP! I'll be very embarrassed when we all find out I've done something foolish but I still don't see what that silly error is.

Fm MISOSYS, Inc: Mike, you got my curiosity up. Send me a copy of your master disk which PATCH reports the find line mismatch. Also include on that disk a copy of the SYS3CLK5/FIX file you are trying to patch.

Cure for SYS3CLK5/FIX

Fm MISOSYS, Inc: Mike, I must apologize for my oversight, but I found the problem with SYS3CLK5/FIX. Not everyone has the problem, of course. I introduced the "bug" when I expanded the front end comments to ensure that folks did not apply the patch to the current system disk. I changed the "Apply via," line to use a full file spec as in "SYS3/SYS.SYSTEM:d" noting that the "d" should be a drive other than the system

drive. But LDOS (Model III) PATCH utility uses a colon ":" as a logical line separator, whereas LS-DOS uses a semi-colon ";" as a logical line separator. The ":d" of the comment was being interpreted as a new logical line with the first character a "d" implying a direct patch. That threw off the whole patch construct. I never checked as to why the mismatch message showed the next D-patch line. Suffice it to say, just remove the ":" from the comment line and the patch will apply. Am I red?

Fm Mike Harrow: Roy, Glad the mystery is solved. It was really driving me crazy there for a few days. Since David was able to apply the patch I was convinced I was doing something wrong! He obviously has a patch file without the :d in the comment line. I totally ignored the comment line as the possible cause of the problem. Thanks for restoring my sanity.

Fm MISOSYS, Inc: I did too since the patch error message didn't reveal the exact line in error. Sure had me stumped. I even was going bananas when I was trying out the patch on someone's disk.

Hard Drive JCL

Fm Hans von Briesen: Roy, my 20 meg disk is up and running, and it's great to have it. You might encounter inquiries of trouble using the file hd20init/jcl.

There is a blank line in (my copy of) the file where there should be the number 154. This messes up the partitioning, and during high-level format, one gets something like "driver incompatible." Somehow, that line got lost in duplication.

I hope that I will sometime be able to boot up from the HD directly from my 4P, but the boot disk is a rather minor inconven-

ience.

This is my first time on CIS for a very long time. I shall wait for MSQ rather than checking in CIS.

You might be interested to know that I was looking seriously at an Aerocomp 5 meg drive, but I wanted to partition it. In MSQ I found that DiskDisk wouldn't work with that drive because Aerocomp's software didn't respect the LS-DOS protocols. I finally decided to throw the extra money, get more space, and still have four partitions. I have two slots left: drive 6 for memdisk, and drive 7 for maybe a sub-disk. Can diskDisk accomplish further partitions?

I copied (c=n) the hard disk park routine to sys13/sys.lsidos so that I can park the disk when shutting down simply by typing '<ENTER>'. That way I can ask my wife and son to park the disk before shutting down. I fancy an elaborate JCL routine with menus for them, but it's not really necessary. Be well.

Fm MISOSYS, Inc: Typically I put a blank line in for the number of cylinders response re the last partition. In that way, the default quantity is chosen. That should not cause any problem.

DiskDISK (or SubDisk, as I called it on the MSCSIx software package), can be used to effectively sub(-partition that drive. It's useful to create sub-partitions the size of your floppy. That makes it convenient. It also makes it useful to explore a larger floppy. With an HD these days, you are less concerned about keeping both of the internal floppies the same type of drive. Consider changing the second one to a 3.5" 720K drive. That may be better at this point for backups, as well. But a 720K subdisk-80D2 is also quite useful in contrast to an 180K subdisk. Since 3.5" drives are getting quite inexpensive, and media prices are reasonable, the 3.5" 720K drive may be a good backup solution, for now.

MSCSI & 2nd HD

Fm MISOSYS, Inc: John J. Kennedy reported a problem in the installation of MSCSI5 using a second hard drive. Seems that there was a problem installing more than one partition - the driver installer would report heads in use incorrectly.

The problem was indeed due to a bug in the installation software. Although I tested out the driver with drives in both the drive 1 and drive 2 positions, either I never examined more than one partition or there was a change in the code which introduced this bug. In any event, I found two problems: one was that it was always looking at the drive configuration information for drive 1 regardless of which drive was being installed, and another was that it was improperly masking off the drive select address when it was doing it's head calculations during installation.

The following patches, one of which is for the MSCSI6 driver and the other is for the MSCSI5 driver, correct the problem.

```
. MSCSI51/FIX - Patch to
MSCSI5/DCT V1.0.2 - 10/24/89
. Patch corrects installation
of second drive
. Apply via PATCH MSCSI5/DCT
MSCSI51
D00,B9=CD 90 69:F00,B9=32 4B 64
D04,75=CD 9A 69:F04,75=DD 7E 04
D06,30=33:F06,30=32
D09,C0=32 4B 64 FD B6 04 FD 77
04 C9
F09,C0=00 00 00 00 00 00 00 00
00 00
D09,CA=DD 7E 04 0F C9
F09,CA=00 00 00 00 00
. Eop
```

```
. MSCSI61/FIX - Patch to
MSCSI6/DCT V1.0.2 - 10/24/89
. Patch corrects installation
of second drive
. Apply via PATCH MSCSI6/DCT
MSCSI61
D00,9B=CD D4 39:F00,9B=32 84 34
D04,AE=CD DE 39:F04,AE=DD 7E 04
D06,74=33:F06,74=32
D0A,04=32 84 34 FD B6 04 FD 77
04 C9
F0A,04=00 00 00 00 00 00 00 00
00 00
D0A,0E=DD 7E 04 0F C9
F0A,0E=00 00 00 00 00
. Eop
```

SD: reusing disabled linkage

Fm MISOSYS, Inc: Ken Strickler reported a problem concerning SD6's re-use of trapped linkages. He was right, there was a problem. I improved SD over DiskDISK in that DD could not re-use a trapped linkage; it could only re-use a linkage assigned to the DCT being enabled. Unfortunately my testing was not sufficient to reveal the error he found.

The following patches, one for SD6 and another for SD5. Application of these patches corrects the problem.

```
. SD51/FIX - Patch to SD5/CMD -
10/20/89
. Corrects reuse of trapped
linkage
. Apply via PATCH SD5 SD51
X'52FC'=-C3 2D 57
X'5338'=-09
X'572D'=-ED B0 EB 01 D6 FF 09 D1
E3 D5 C9
. Eop
```

```
. SD61/FIX - Patch to SD6/CMD -
10/20/89
. Corrects reuse of trapped
linkage
. Apply via PATCH SD6 SD61
X'26FF'=-C3 B0 2B
X'2751'=-09
X'2BB0'=-ED B0 EB 01 D6 FF 09 D1
E3 D5 C9
. Eop
```

PRODUCT REPORT

Ken Strickler
P.O. Box 773
Stanwood, WA 98292-0773

New Harddisk System

for Radio Shack Model III/4

External 20-80 MEG Harddisk system
REAL TIME CLOCK (option)
JOYSTICK (option)
PRICE \$495.00 and UP

Price as tested \$738.00

Options as tested: 40 MEG (28 MS, auto park heads) Seagate 251-1; Real Time Clock, Joystick

Distributor:

MISOSYS, Inc.
P.O. Box 239
Sterling, VA 22170
Tel: (703) 450-4181

Roy Soltoff of MISOSYS, Inc. has just released an external Hard Disk assembly for the Model III/4 computers, containing 1 or 2 half high slots, REAL TIME CLOCK, Joystick interface, Host Adaptor card, accessory card, power supply and fan. The Beige "box" is 7" wide, 5.5" high, and 15" deep. Additional depth is required for cable access, a couple of inches should suffice.

Software provided supports either the Model III OR Model 4, with the additional system interface available for a slight extra charge.

After losing 2 - 5 MEG and 1 - 10 MEG TANDON hard disk BUBBLE, I placed an order for the 40 MEG hard disk system described above and waited as Roy completed the final construction of the hardware, and writing/debug of the software support packages. (Time well spent!)

The system arrived late in September consisting of the hardware, and 2 software disks containing 1) Model III software, and 1) Model 4 software as requested. Careful reading of the documentation indicated the following support software was included: (x=5 for Model III, 6 for Model 4)

ARCHIVEx/CMD - Utility for backing up files/disk to floppy disks.

ERRORx/CMD - Descriptive display of last error encountered.

FSCSIx/CMD - Low Level formatter.

HD20INIT/JCL - JCL file to install a 20 MEG hard disk system.

HD40INIT/JCL - JCL file to install a 40 MEG hard disk system.

HDCHECKx/CMD - utility to test all sectors of the hard disk.

JSTICKx/FLT - filter program to enable the JOYSTICK.

MALARMx/CMD - operates hardware clock alarm. (option)

MCLOCKx/CMD - set/read hardware clock.

MSCPARKx/CMD - head parking utility for 20 MEG hard disks.

MSCSIx/DCT - system interface for the hard disk.

MSCSIFx/CMD - high-level formatter.

README/TXT - additional information over and above manual.

RESTOREx/CMD - restore hard disk from floppies.

SDFORMx/CMD - partition hard disk into smaller "logical" devices.

SDx/CMD - assigns "logical" devices created by SDFORMx/CMD.

SETJSx/CMD - alter joystick keystrokes after installation.

SWAP/CMD - swaps logical devices after installation.

SYS0CLKx/FIX - patches operating system to access real time clock on power up and not require inputting on initialization.

SYS3CLKx/FIX - Patches operating system to update the system clock from the real time clock after each disk access. (keep system clock accurate).

The 59 page Software Interface Package operators manual provided describes all of the options which can be performed by each of the programs. Error messages are explained and technical information is provided to help all levels of interest in the system.

A 16 page MHD-T34 Hard Drive Kit operators manual describes in detail the contents and location of the various hardware parts in the "box".

As you can see, a significant effort was put forth to make the users (that's us) life with a hard-disk much easier.

Step by step the installation is easy if you just take you time.

1) Using the Low-level formatter (FSCSIx) the physical characteristics of the hard disk are described to the system. Information such as the number of heads, number of tracks and track-to-track access times are entered. The hard disk is then checked by the low-level formatter. (A good time for the "First Cup of COFFEE.") This procedure has to be accomplished only once, as the high-level formatter will use this information to perform its task.

2) Now the high-level formatter will be used to describe the physical characteristics of each of the partitions. (Any size partitions can be constructed.) The JCL

files (HD20INIT or HD40INIT) can be applied to automatically establish your hard disk. I would recommend trying one of these to save some time and see how it is done. HD20INIT and HD40INIT both contain options to allow DUAL (both Model III and Model 4 systems to use the hard disk), and FORMAT which continues to perform the high-level format on the partitions. Care has been taken so that performance of Model III HDxxINIT does not interfere with the Model 4 HDxxINIT if DUAL is requested. (This is about a "half-a-cup-a-coffee" task.) At the conclusion of this step, a SYSGEN as described in the JCL file will save your new configuration.

3) Now the data from all those floppies that you can never put your hands on can be placed on the various partitions, or SUB-disks (SDFORMx, SDx) which you make.

A Few BONES to dig.....

1) I found that I must (I have a 4p, which I run in both Model III and Model 4 mode, containing the MISOSYS XLR8er-256K card) pay careful attention to the POWER UP SEQUENCE. I have effectively LOCKED OUT access to the hard-disk system if I turn on the computer FIRST, even though I don't boot it up. The message I receive is that the clock is either not installed, or the battery is dead. Further, access to the hard disk for read/write appears to be impossible. I did find that, while I couldn't read/write programs, I COULD RE-FORMAT (low-level) and would get a hard-disk error.

2) While I can "build" a SUB-disk in Model 4 which is 80 tracks DSDD (720K) in size, in model III mode I get the message "too many extents". This, I'm sure, is a very MINOR problem.

Overall - this is a very nice addition to the Model III/4 family providing up to 80 MEG of storage, a REAL-TIME clock and JOYSTICK interface. I would like to see the operating system expanded to contain more DEVICES to allow for more than just 8. If you have 4 Hard disk partitions, 2 Floppies, and a RAM-DISK, 7 of the 8 DEVICE slots are in use, leaving only 1 to be directed to a SUB-disk. The

wordprocessor that I use, ALLWRITE, when linked to the FONTS from DOTWRITER require 5 SUB-Disk slots. System configuration becomes a little complex!

Fm MISOSYS, Inc: The preceding review submitted by Ken Strickler has been printed verbatim. However, MISOSYS believes that it contains a few inaccurate statements. Therefore, the following "rebuttal" is provided.

To begin with, I specifically state that MISOSYS performs the low-level formatting; thus there is no need for the user to do that unless he/she wants to. See page 6 of the MSCSI Operator Manual excerpted as follows (pertinent statement in boldface):

"2) Invoke the low-level formatter, FSCSI, to apply low-level format information to the hard disk drive. Note that this formats the entire hard drive specified. **Such low-level formatting is initially done by MISOSYS prior to shipment of your hard drive pre-assembled kit; you will rarely have to perform this step.**"

I don't know what the root cause of Ken's problem in the power up sequence was, but I have not had any problems in powering up with any sequence.

The message that "the clock is not installed..." is displayed when the MCLOCKx or MALARMx software cannot see the clock. This would occur normally when the battery is exhausted or if you have the hard drive turned off or unplugged from the computer and you invoke either of those programs. Incidentally, the clock patches are designed to bypass any garbage initialization if the added code does not see the clock. This is important in the SYS3CLK fix which reads the clock time during every @CLOSE operation. If it doesn't see the clock hardware, it does no updating of the system time.

The Model III version of SDFORM is no more prone to being unable to create the requested subdisk file than the Model 4 version. A limitation of subdisk (as is with diskDISK) is that the /DSK file cre-

ated must be allocated to no more than twelve extents (that's three directory records). If you attempt to SDFORM a large subdisk on a very fragmented disk - one with many small holes of unallocated granules as observed from a FREE command - SDFORM may be unable to complete the creation. The exact code is used on Model 4 and Model III. I suspect that Ken's attempt to create a subdisk using SDFORM5 was targeting a fragmented disk drive.

MRAS Assembler

Fm MISOSYS, Inc: I recently had occasion to generate about six inches thick of assembly printouts when I wanted to get listings for every module making up the Model III and Model 4 MSCSI software which accompanies our hard drive package. Certainly, that volume of printouts would have taken a great deal of time, even on our fastest dot matrix printer, not to mention the wear on the printhead and printer itself. So I decided to use my NEC LC890 laser printer.

One thing about a lot of laser printers is that they generally cannot print to the extreme edges of the paper. But there is no way to adjust the left hand margin within the printer itself.

Another problem is that MRAS was designed to expect the paper be positioned five lines from the top of form. This also would conflict with the LC890's inability

to print within the top 1/4" of the paper.

So to correct all of the problems, I developed a small patch to MRAS which changes its expectation of printer page alignment to expect the paper to be at the top of the form. The only hitch is that the source file(s) must use a TITLE pseudo-OP. Here's the patch:

```

.MRAS6L/FIX - Patch to PRO-
MRAS
.Adapts for laser printing
D03,38=3A
F03,38=38
D04,21=06 0A 0A 20 20 20
F04,21=4D 49 53 4F 53 59 53
.Eop

```

Before using the patched MRAS, it is necessary to install the DOS FORMS filter with:

```

SET *FF FORMS
FILTER *PR *FF

```

then use FORMS to set ADDLF, FFHARD, CHARS=20, and MARGIN=10. I use my laser printer in its Diablo 630 emulation mode at 15 cpi. I must say that the printouts spewed forth at great speed. The only other hitch occurred when the message printing the "00000 errors" caused a new page to be ejected; that was not followed by a TOF. So it would be useful to follow each printout with a TOF command.

PRO-WAM

**PRO-WAM needs
one memory bank**

Fm Mike Anderson, Portal, ND: Dear Sir, We have the following software for a Tandy Model 4 computer: PRO-NT0 Window and Application Manager, Registration #00820

MISOSYS

Programmer's Journal downloads are now available from MISOSYS' forum on Compuserve: GO PCS49

HartFORTH-86™

HartFORTH is a full 79-STANDARD FORTH. It is a Direct Threaded Code implementation which provides an execution speed between 10% and 40% faster than the classical Indirect Threaded Code implementation. HartFORTH is designed to run under DOS so the Virtual Memory that it accesses for storage and retrieval purposes is a file created and controlled by the operating system. Enhancements to the 79-STANDARD have been built into the HartFORTH kernel in the form of functions to call the DOS file handling routines so that other files may be created and accessed if required. A library of standard screens is supplied with HartFORTH to provide often used extensions to the language, such as double length and floating point math, editing of source screens, string manipulation, arrays, etc.

Here's the FINE PRINT

Any MISOSYS software product purchased directly from MISOSYS may be returned within 30 days of the invoice date for a full refund of the product purchase cost. Returns must be in a "like-new" saleable condition and be accompanied by a copy of the original invoice.

HartFORTH-86

\$59.95 + \$5S&H (US)

MISOSYS, Inc.

P.O. Box 239

Sterling, VA 22170-0239

800-MISOSYS or 703-450-4181

- HartFORTH programs can invoke other programs via **EXEC** and **EXEC.PROG**.
- Functions create new files from within HartFORTH, and allow the current Virtual Memory file to be changed for another and manipulated at the individual block level.
- Provides the recommended 79-STANDARD DOUBLE NUMBER STANDARD EXTENSION word set that implements 32-bit operations.
- **CASE:** and **SWITCH:** functions allow multi-way branching decisions to be taken with execution continuing in-line once the word branched to completes.
- String manipulators include: "VARIABLE, "CONSTANT, "!, "LEFT, "RIGHT, "MID, "+, "COMPARE, and ">".
- DOS software and hardware interrupt vector access support via: GET.VECTOR, PUT.VECTOR, THIS.SEG, DI, and EI.
- V24 program input, output, and interrupt input support.
- Overlay management words: FORGET.OVLY, OVLYNAME, PUT.DATA, OVLY.ENTRY, SAVE.OVLY, CORRECT?, LOAD.OVLY, NEW.OVLY, RUN.OVLY, and LEAVE.OVLY.
- Screens provide trigonometric functions: SIN., COS., TAN., SIN, COS, and TAN.

We are not able to get PRONTO to load. Keep getting the following error message:

'No external memory is available for Pronto'

We have not used the program for a long time and since then we have upgraded the computer to 512K with a Super Mem expansion board from Anitek. We are wondering if that is the reason we can not load Pronto.

We would greatly appreciate any information and advise you may have to overcome the above problem.

Fm MISOSYS, Inc: Dear Mike, Note first of all that the "PRO-NT0" package was renamed "PRO-WAM" 3 years ago to avoid a trademark infringement with Chemical Bank. Also, PRO-WAM was upgraded to version 2.x about 2.5 years ago. None of these changes affect the problem you are currently having.

The operation of PRO-WAM requires one free 32K memory bank. Installation of Anitek's memory expansion board in itself would not eliminate the two extra 32K memory banks normally available in a 128K Model 4; however, if you are also using their RAM drive software and are using all memory in excess of 64K for the drive, then you have no free memory for PRO-WAM's installation. I suggest you try to reduce your usage of RAM drive memory to allow at least one free bank (bank 1 or 2). I would hope that their software permits such flexibility.

PROWAM vs BASCOM

Fm Dave Krebs: Joe, Do you know of any conflict between PROWAM and BASCOM or BASCOM compiled programs? I have noted recently that after I have compiled a BASCOM program or run one running with BASRUN support, the result is the following:

A window will open but any data file needed will not appear in the window. This leaves the data file OPEN and hangs the CPU.

BTW, the machine is a 128k 'old' model 4 with a R/S 5 meg/RSHARD and an ALPHA speed-up unit.

Fm Kyle-DiPietropaolo: Dave, I haven't heard of any specific problem, but there's always a chance. I don't suppose that the BASCOM program could be overlaying high memory, eh? Sounds like something Microsoft would pull. You might check to see if the high memory chain is barfed after exiting the BASCOM program.

Fm Dave Krebs: Joe, I really didn't get too deep into that, I DID look at both the BASCOM and BASRUN file with a program called MAD to see where they loaded, exec and end of the program was. They both looked OK in that inspection. At first, I thought one of them used memory below 3000H, but both ORG at 3000H. I'll look into them not behaving and looking at HIGH\$... let you know!

FED/APP bug?

Fm Bob Haynes: Roy, I finally got round to merging my Mr Ed package into WAM0/APL. Amazing how we can overlook the most useful things! Anyway, the distribution disk is dated 2/10/86, README/TXT is 3/18/86, FED/APP is 2/18/86.

I find that under WAM 2, though FED closes modified files OK, it leaves unmodified files in an open condition, requiring a RESET afterward. A major nuisance! Has this been fixed by chance? Also, while reading thru back issues of TMQ I noted you had a reassembly fix for TED. Is that refresh offer still good? Also, I have an OLD copy of MC needing an refresh, understand you have a major update w/doc changes. Please advise pricing policy on that also?

Fm MISOSYS, Inc: No one reported that bug, and I never came across it. I'll look into it after vacation, after TMQ 4.1, and after HD's get shipped. The offer to refresh the MrEd disk still stands: it's free. You supply a return address label.

If you are not up to V1.6 of MC, then you need the \$20 upgrade. If you have 1.6, then just send in the library disk for a free upgrade.

Time marches on...

As far as your problem with FED/APP, you must have some local problem. First, it doesn't happen here with testing. Second, I looked at the source code and it is impossible for FED/APP to "leave the file open". The code opens the file, then if the file was opened successfully or with LRL open fault, it saves the FCB contents and closes the file. Any other error condition would not have opened the file setting the "directory file open bit". Thus, as far as the DOS is concerned, the file is closed! You better double check your own operation and confirm what is going on locally.

All the way to FIVE TWELVE K

Richard King
808 Orleans Place
Raleigh, NC 27609
919-872-5846

For some time now I've had the urge to reinstall an XLR8er, even after my first attempt (pre-Michel Houde) failed miserably when the motherboard memory chips wouldn't stay refreshed for very long after booting with a base XLR8er diskette. (Thanks, Roy, for having a 30 day return policy.) Even then, one thing about the XLR8ER bugged me - it can address 512K of memory but it uses only 384K of its ability. Somewhere out there were two answers, and I was determined to find them.

After getting a Roy's response to several nagging questions (TMQ IV.i,36), I designed and tested drawings "R" and "N" on my Rev. C machine. The circuit uses 256K chips with a built-in feature called CAS-before-RAS refresh (see list below). My design eliminates the need to generate extra refresh pulses (80 Micro, 10/87, p.60); in fact, the chips ignore the address lines completely when this refresh mode is used. They maintain an internal counter to optimize refresh activity, AND IT WORKS! So now I had 256K of memory on an otherwise vanilla model 4, although only 128K was accessible at any given time.

With the hardware working, I ordered the XLRer from MISOSYS (your price drop was the clincher, Roy) along with the Disk Notes III.ii to get Michel Houde's source code. Permit me to share my ideas and experience with you.

For the XLR8er user, all you'll need are (8) 256K chips from the list below, (1) 74157 or 74LS157 multiplexer chip (use a 74157 if you plan to attempt installing

The Hardware Corner



512K on the motherboard, to handle the extra load), (1) PAL chip for socket U72 (maybe, read on), either a 27 or 56 ohm resistor, and some wire-wrapping wire. If you like to make your modifications more easily removable, throw in a few 16 and 20 pin low profile soldertail sockets for good measure. (Sorry gate array board owners, I don't have a solution for you all. I lack the logics for those boards. Can you supply me with two clear sets?) Even if you decide to stay at 128K for the remainder of your Model 4 days, consider making a portion of this modification because it uses more readily available chips that cost about the same as two sets of 64K chips. If one bit goes bad, chances are you can move one wire and use the other half of the chip set for years to come. Last but not least, the refresh cycle is more dependable, if you've ever suspected this as a cause of intermittent problems due to speedup kits or other modifications.

WARNING - THESE CHANGES MAY CAUSE TANDY TO FROWN ON SERVICING YOUR MACHINE, THOUGH THEY ARE REMOVEABLE SHOULD THE NEED ARISE.

You will reach a point in this article where you must make a rather critical decision. Regardless of the path you choose, you will be making modifications to the logic of your model 4 board and later to the supporting software. Hardware-wise, you must decide if you want to continue using Radio Shack's design for mapping the first three banks via Port 84. Advantages - all software should work as though you did not make these modifications. Disadvantages - Use of low memory from x'0FF4' through x'106E', one byte more than Michel Houde's code; more wiring to the board than your other choice; continued use of the PAL/HAL chip in socket U72.

Your other choice is to abandon Port 84 and let the HD64180 manage all memory banks. Advantages - less wiring to the board than the above choice; relocation of Michel Houde's code to lower memory, releasing x'0FF4' et al.; the PAL/HAL chip in U72 not needed. Disadvantages - none, unless some application program that you use is bypassing @BANK code and doing its own bank switching [editor's note: I believe that LeScript access extra memory directly via hardware port manipulation rather than through @BANK]. Model III bank switchers may fall in the category. (The supporting code for this choice attempts to halt such actions by marking banks 0-2 as "in use", hopefully causing the renegade program to belly up because it cannot access the memory.) I'm sorry to say that because this article covers multiple options, it may appear to be somewhat hodgepodge in structure. You should see what wasn't sent to TMQ.

WARNING - READ AND UNDERSTAND ALL THE INSTRUCTIONS BEFORE YOU DO ANY OF THEM. IF YOU HAVE ANY DOUBTS, CONTACT ME AND I'LL TRY TO HELP YOU.

Create 2 test diskettes containing a fresh backup of LS-DOS with utilities. After removing the outer cover (lift it carefully and straight up to avoid damaging the neck of the video tube) and the radiation shield surrounding the motherboard, locate socket U72 about midway across the bottom row. If it has a 4-position jumper plug (note that the plug engages sockets 6-9 and 12-15) then you may need the PAL chip, based on the decision mentioned above. (F.Y.I., Tandy's Mod 4 service bulletin #5 states that U72 should have the manufacturer's logo, p/n and date code in yellow ink, or the Tandy part number must be 8075968. The bulletin says p/n 8075468 causes problems.) For those who choose to continue using port 84, take the PAL (or HAL) chip out of socket U72, bend pins 9, 12 and 19 away from the body (see sketch - socket lovers, do this work on the soldertails, not the chip pins), so they will not enter the U72 socket when the chip is re-inserted later. Now solder a jumper across the broad shoulders of pins 9 and 10 of the chip. (For you technical types who have Model 4

```
. XLBOOTK/FIX - To use XLR8er special features (03-Sep-88)
. Written by Richard R. King, 808 Orleans Place, Raleigh, NC 27609
. PATCH boot/sys.lsidos USING xlbootk/fix (O=N)
. Must also PATCH sys0/sys.lsidos USING xlays0a/fix
. Must also apply 512K hardware mods. See Misosys Quarterly vol
IV.11 - RRR
. fix lomem pointer @x'0206'
D00,06=6E 10
F00,06=F4 0F
. new @MUL16 svc @x'06c9'
D04,C9=57 5D 6F ED 6C ED 5C 7B 5A 16 00 19 C9
F04,C9=C5 EB 4F 21 00 00 7D 06 08 29 17 CB 01
. TASKER patch1. end of old @mul16 @x'06d6'
D04,D6=ED 28 38 E3 E5 AF ED 39 38 21 78 00 C9
F04,D6=30 03 19 CE 00 10 F5 4F 7D 6C 61 C1 C9
. @BANK beginning @x'0877'. XBUR$ @x'087b'
D06,77=79 C3 FD 0F 00 00 00
F06,77=E6 7F FE 03 D2 ED 0D
. @VDCTL @x'0b9a' JP to fix
D09,9A=59 10
F09,9A=42 0D
. ROWCOL 2 ADDR @X'0ddf' multiply
D0B,DF=2E 50 ED 6C 00 00 00 00
F0B,DF=21 50 00 CD C9 06 65 6F
. change delay in FDC driver @x'0f26'
D0D,26=24
F0D,26=12
. add XLR8 module @x'0ff4'. @BANK and @VDCTL
. Byte 13 of next line is bank count. 0F = 512K, 07 = 256K, 17 =
768K.
D0D,F4=18 FE 6E 10 04 58 4C 52 38 E6 7F FE 0F 30 53 D6
F0D,F4=00 00 00 00 00 00 00 00 00 00 00 00 6D B6 6D B6
D0E,04=03 30 0A AF ED 39 38 79 E6 7F C3 7E 08 E5 04 10
F0E,04=6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6
D0E,14=11 21 05 80 39 38 39 07 07 07 C6 18 ED 39 38 C3
F0E,14=6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6
D0E,24=0B 08 6F 2C 26 01 3E 7A CB 0C CE 00 2D 20 F9 6F
F0E,24=6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6
D0E,34=7C 26 08 10 04 2F A6 18 0E 10 05 A6 3E 08 E1 C9
F0E,34=6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6
D0E,44=10 09 ED 34 20 F6 B6 77 AF E1 C9 10 03 3A 02 02
F0E,44=6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6
D0E,54=E1 C8 C3 ED 0D ED 38 38 B7 CA 42 0D F5 AF ED 39
F0E,54=6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6
D0E,64=38 CD 42 0D E3 ED 21 38 E1 C9
F0E,64=6D B6 6D B6 6D B6 6D B6 6D B6 6D B6 6D B6
```

logics, this jumper tells the chip that the *CAS signal is always present, causing *CAS1 (pin 12), *CAS2 (pin 19) and MPA15 (pin 13) to settle down and be available to the memory chip addressing pins sooner.) While you still have the chip (or socket) in your hand, put a little solder on the shoulder of pin 12 for a later connection. Set this chip aside for the time being.

This next step can be done on either the front or the back of the motherboard. The back is easier and should be chosen if you plan to use an XLR8er board. Referring to drawing "R", prepare several jumpers from wrapping wire. Strip about 1/8" from each end and tin the bare wire. Component-side modifiers should also tin the broad

shoulder of the chip pins mentioned here, and when everything has a chance to cool, gently hold the wire end to the chip leg and reheat the solder with your iron to make each connection. Here we go. One wire will go from U58-19 (PAL/HAL chip) to U52-5 (*CAS signal). A second wire will go from U57-28 (that's your Z80A, bunkie) to U52-4 (*REFRESH). The last wire will go from U52-6 to U72-12 SOCKET - or- pin 15 of any one of the 256K memory chips installed in sockets U77 through U84 (*CAS1). (This unused U52 logic block creates a new *CAS1 signal which goes active at either the normal *CAS time or when *REFRESH is called for. During refresh, *CAS will activate long before the normal refresh *RAS goes active.)

If you will use only 128K of memory, refer to drawing "N" and skip down to where we add the resistor. For those who will be addressing the full 256K of motherboard memory, take the new 74(LS)157 chip (I'll call it Z63) (socket lovers, use a socket here) and bend pins 2-7 and 9-14 so they are parallel to the chip body (see sketch). Tin pins 1, 8, 15 and 16 on the inside of the tips, then tin the broad shoulders of the same four pins of U63 (double check - it must also be a 74157 chip). Last, slip Z63 over U63 (if Z63 doesn't grab U63 like Garfield on a car window, bend the legs together a tad) then heat each of the four overlapping pins so the solder flows and joins the circuits. (Z63 provide a multiplexed signal to the 8th address line of the 256K chips. It gets its power and switching signals from U63.)

If you choose to abandon port 84, read the technical section near the bottom for details about drawing "S", which you will be using, then jump to the next paragraph. If you choose to keep port 84, board revisions force choosing a path because we will be activating more "unused" logic available on the motherboard. Non-REVision and Rev. A board owners should refer to drawing "A". Rev. C board owners should refer to drawing "C". (I've not seen a Rev. B board, but the logics for Rev. C imply that B has only minor variations in some component ID's and values, and that U201 through U206 do exist on the board near cable socket J-7, upper left corner. I have not the Rev. B or D logics, can someone help me?)

If you've followed my changes this far (not very complicated are they) you should be able to do the work shown in the appropriate drawing, so I won't waste more TMQ space here. NOTE the input signal lines marked 'A16' and 'A17'. These wires must be attached to the XLR8er board. I've chosen to make my connections with Radio Shack's micro test clips (p/n 270-355 - don't use 270-336 flat test clips, they won't lay as expected) soldered to lengths of wrapping wire which are, in turn, soldered to the motherboard chip pins shown in the drawings. To prevent pulling the test clip leads off the soldered joints, I wrapped the insulated portion of each lead around a nearby motherboard component lead several times,

a form of "strain relief". Make these two leads about 12" long, then cut to a convenient length later and solder a micro clip to each.

After installing circuit "A", "D" or "S", a resistor must be used in the line which drives pin #1 (A8) of the 256K chips, and eight capacitors must be disconnected from pin 1 of the first bank of memory chip sockets. The capacitors are to the left of the first bank of memory chips, and should be labelled C66, C70, C74, C78, C82, C86, C90 and C94. You can cut just one lead of each and move the capacitor aside, or cut both ends to remove them completely. The capacitors were needed for the 16K chips, but they don't serve any useful purpose with larger memories; pin 1 of most 64K chips is marked NC (No Connection). If left connected, the capacitors will shunt chip signal A8 to ground.

Your resistor value is determined by resistor pack RP4 located adjacent to U76. You should see a number like "270" or "560" stamped on the RP4 body. The number means "a value of 27 (or 56) followed by zero 0's, i.e., 27 (56) ohms". Some units may be stamped "27", or "56" directly. These resistors dampen oscillations in the signal lines. The new resistor for signal A8 should be the same value as those in RP4. If you have installed the "157" chip, the resistor will go between Z63-12 and E12, the middle of three jumper pins located above U77 memory chip. If you are installing 256K chips on a "standard" 128K machine (drawing "N"), the resistor connects U72-12 to E12 (or U72-19 to E12 to use the "other half" of the chips). What I did was to remove the jumper from E11-E12 (for 16K owners, it jumps E12-E13) and pry up the metal pin cover (seen when the jumper is on the pins) to reveal one pin hole from the back side. I bent one end of my resistor lead with a slight wriggle and pushed it into the exposed hole, making sure that it didn't go all the way to the bottom of the jumper block (to avoid possible shorting to a printed circuit land pattern). The other hole of the jumper block was placed on E12, which connects to pins #1 of the first memory bank. The loose end of the resistor is soldered to U72-12 (drawing "N") or Z63-12. If you don't feel too good about exposed resistor leads, put a piece

of spaghetti over each before you begin installing it.

(Re)Install U72 (if used) and Z63 (if you've chosen to socket it). Install eight 256K chips in the left set of memory sockets (U77 and below), using proper CMOS handling techniques to avoid blowing the chips with static electricity. (I move to our stainless steel kitchen sink which has copper plumbing feeding it, and block the sink drain so chips don't accidentally fall into the food disposer. With one bare arm resting on the sink rim at all times, I proceed to remove and/or replace CMOS chips in a semi-awkward fashion. It works for me.) Install the (NOTE: CMOS-equipped) XLR8er board and hold it in its approximate "covers on" position. Trim the A16 and A17 jumper wires to length and solder the micro test clips to them. (Leave yourself some reasonable slack with these wires; their length is not super critical.) Attach A16 clip to XLR8er board chip U4-11, and A17 clip to XLR8er board chip U4-10. **DOUBLE CHECK ALL WIRING, THEN CHECK IT AGAIN TO BE SURE.** Especially ensure that the A16 and A17 clips are not shorting where they connect to U4. With the machine cover laying on its side adjacent to the base, connect the video cable and ground wire, then power up the machine. Watch for smoke (just kidding). If none appears and the disk drive rattles its way to track 0, you should be off and flying on your new chips. Push a test diskette into drive 0 and boot away.

As mentioned above, software must also be installed to complete this project. The verifications in the /FIX files mandate that you start with a fresh copy of the LS-DOS system on a diskette. Drawing "N" users, there are no patches. Drawing "A" and "C" users will need to install XLBOOTK/FIX in place of the XLB-OOA/FIX file; Drawing "S" users will need to install XLBOOTS/FIX and XLSYS0S/FIX files in place of the XLB-OOA/FIX and XLSYS0A/FIX supplied on your XLR8er Installation Utilities TRSDOS-6 diskette. Also apply the remaining Houde/FIX files. You will need to reconfigure your system because of either @BANK modification in low memory and the fact that the configuration save routine captures the memory

image starting at x'0FF4', which contains these changes.

TECHNICAL

For the technical types, drawings "A" and "C" are logically the same, employing unused Model 4 logic circuits. The XLR8er uses much of Steve Ciarcia's SB180 computer design featured in BYTE magazine, 9/85, with only minor modifications. XLR8er uses the same M1 wait generator (BYTE, p.94, IC15, for those who are trying to figure out why your timing tests don't match your calculations) and the same addressing and refresh circuits (p.95, IC14). The XLR8er designers replaced Steve's boot ROM with the ability to access the Mod 4's motherboard RAM. In other words, all addresses to the first 256K of memory are ignored by XLR8er's memory. Trouble is, there aren't any spare pins in that Z80 socket to transport address lines A16 and A17 to the motherboard. Once we access them via the jumpers, we need to control how they manipulate memory and interface with port 84's (and U72's) memory control. That's where these changes come in, working in conjunction with the software modifications. Drawings "A" and "C" continue to use port 84, but manipulate its ability to address the first bank of chips. Drawing "S" abandons port 84 and probably improves machine reliability in the process. Note that in drawings "A" and "C", address line A17 is used as the memory row select, A16 is used as the memory column select to allow the circuit drawings to settle down during row address time.

Without port 84's presence, address line A16 is used during access to the 2nd and 4th quadrants of the 256K chips. If port 84 is used, A16 may only be allowed to access the 4th quadrant of the motherboard memory. The circuit in drawings "A" and "C" monitors A17. When A17 isn't active, port 84 controls the addressing of memory. When A17 goes active, it blocks port 84 control and allows A16 to take over. (In a similar manner, when the 64180 activates address line A18, reads and writes to the motherboard chips are blocked and ram access is directed to the XLR8er memory chips.) Software controls the 64180's address translator so that

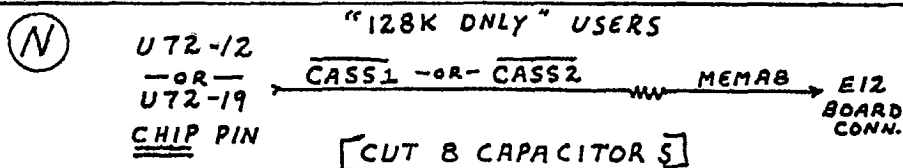
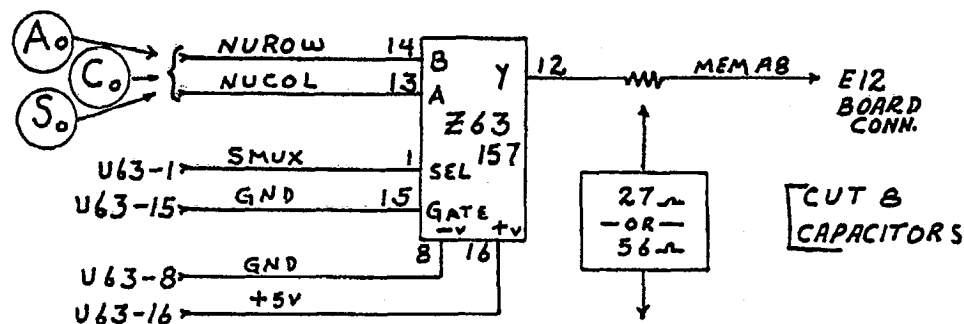
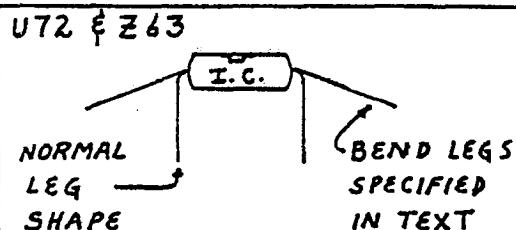
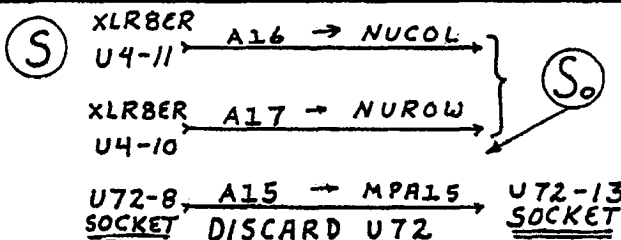
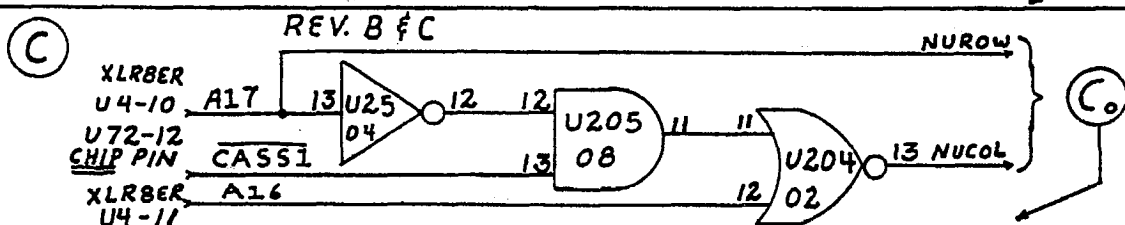
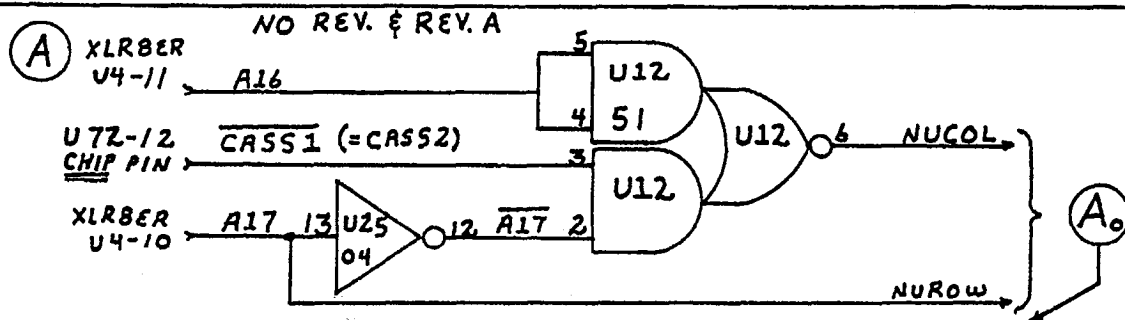
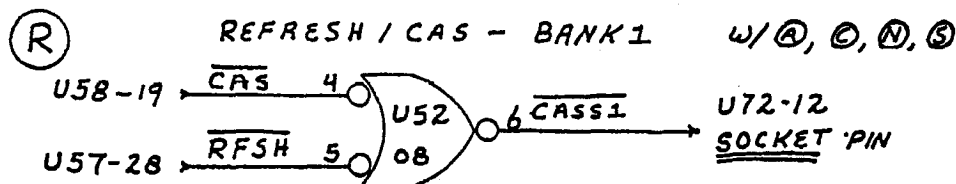
```
. XLBOOTS/FIX - To address 512K and use XLR8er special features. 21-
SEP-89
. Written by Frank Slinkman, 4108-C Fairlake Lane, Glen Allen, VA
23060
. From dos READY, enter the command PATCH BOOT/SYS.LSIDOS USING
XLBOOTS/FIX
. Must also patch sys0/sys.lsidos using XLSYS0S/FIX
. Must also apply 512K hardware mods. See Misosys Quarterly vol
IV.11 - RRR
. This code replaces M. Houde's XLBOOTA/FIX patch code (won't over-
lay it)
. New @MUL16 avc @ x'06C9'
D04,C9=57 5D 6F ED 6C ED 5C 7B 5A 16 00 19 C9
F04,C9=C5 EB 4F 21 00 00 7D 06 08 29 17 CB 01
. TASKER patch1. End of old @MUL16 @ x'06d6'
D04,D6=ED 28 38 E3 E5 AF ED 39 38 21 78 00 C9
F04,D6=30 03 19 CE 00 10 F5 4F 7D 6C 61 C1 C9
. New @BANK routine begins @ x'0877'. 32 bit XBUR$ now @ x'08d7'
. Byte 5, next line = max # banks +1. 0F=512K, 07=256K on mother-
board only.
D06,77=79 E6 7F FE 0F 30 55 E5 04
F06,77=E6 7F FE 03 D2 ED 0D 05 FA
D06,80=10 20 21 05 80 39 38 4A 07 07 ED 39 38 21 02
F06,80=B3 08 0E 86 28 19 0E 46 05 28 14 05 28 09 05 C2
D06,90=02 46 79 E6 7F 77 E1 A9 B0 4F CB 79 06 00 C8 E3
F06,90=ED 0D 3A 02 02 BF C9 47 CD 9F 08 C0 78 0E C6 E6
D06,A0=BF C9 6F 2C 26 01 3E D6 CB 0C CE 00 2D 20 F9 6F'
F06,A0=07 07 07 07 B1 32 B0 08 AF 3E 08 E5 21 00 02 CB
D06,B0=7C 26 08 10 06 2F A6 77 AF E1 C9 10 05 A6 3E 08
F06,B0=46 E1 C9 E5 21 05 80 39 E1 DA ED 0D FE 01 17 47
D06,C0=E1 C9 10 07 ED 34 20 F6 B6 18 EC 10 05 3A 02 02
F06,C0=3A 01 02 A0 20 C9 78 1F 3F CE 00 07 07 07 47
D06,D0=E1 C9 E1 3E 2B B7 C9 00 00 00 00 ED 38 38 CA 42
F06,D0=3A 78 00 E6 8F B0 32 78 00 D3 84 3A 02 02 47 79
D06,E0=0D F5 AF ED 39 38 CD 42 0D E3 ED 21 38 E1 C9 00
F06,E0=E6 7F 32 02 02 A9 B0 4F CB 79 06 00 C8 E3 BF C9
. @VDC1L @ x'0b9a' JP address to fix.
D09,9A=DB 08
F09,9A=42 0D
. ROWCOL 2 addr @ x'0ddf' multiply.
D0B,DF=2E 50 ED 6C 00 00 00 00
F0B,DF=21 50 00 CD C9 06 65 6F
. Change delay in FDC @ x'0f26'.
D0D,26=24
F0D,26=12
```

the A16 line will never go active unless A17 and/or A18 are active too. This prevents an addressing foul-up in circuits "A" and "C".

If I haven't totally scrambled your brain yet, consider this. With the ability to control the 64180's internal address translator, we really don't need U72 and might be better off without it. Houde's modifications **do not allow controlling any more than 11 banks of memory** correctly, though he provides several utilities which can work with up to 31 banks. I guess he never felt some nut like me would come along and want to utilize that extra elbow room.

Frank Slinkman to the rescue. Frank wrote a new(er) @BANK control routine which

can manage up to 31 banks, or one meg of memory in all. He has graciously given permission to include his code with this article. His design eliminates the need for U72 and simplifies even further the bank management process. Since two of the three 64180 chip versions have an A19 address line to access a full meg of memory, Frank's code is prepared to handle it. Drawing "S" (for Slinkman) can then be used instead of drawing "A" or "C". NOTE that U72 must be removed, and a jumper placed between socket pins U72-8 and U72-13 (A15 to MPA15). U72-9 **Must not be jumpered** to U72-12, since *CAS is wired through U52. (And yes, my design can be expanded to put another set of 256K chips in those empty motherboard sockets, though the XLR8er does not address beyond 512K.) Two questions



remain which will affect your decision to use "A", "C" or "S": 1) has anyone written a commercial application which uses one or both of the "oddball" addressing combinations available via U72; 2) does any application bypass the @BANK svc and manipulate the bank control port and flags directly? Only time and testing will tell. I've modified Frank's patches to turn on the original memory management's bits (at BAR\$ & BUR\$), in an effort to trap anyone not playing by LS-DOS's rules.

Frank's code, XLBOOTS/FIX and XLSYS0S/FIX, completely releases low memory starting at x'0FF4' for use by drivers and the like. There is a caveat, however. It appears that neither Michel nor Frank test for the presence of memory chips on the XLR8er board during boot or in the @BANK code. If, for example, you pointed PRO-WAM to a phantom bank 8, you could wind up with a vegetable. XLBOOTS/FIX identifies the byte to modify if you will be using only 256K on the motherboard. Frank's code will need several changes to be useable with a "normal" 128K Model 4, one without an XLR8er and hardware modifications "A", "C", or "S" installed. That ball is in your court.

Using Frank's banker as a model, I've modified that portion of Michel Houde's code which controls bank switching. Frank's coding techniques are beautiful. Using them helped me keep the expansion of Houde's code to only one byte while expanding bank control to be able to handle up to 768K of memory. My modifications are in XLBOOTK/FIX. Use the remainder of Houde's /FIX files to round out the code changes.

MEMORY

Here's a partial list of chips purporting to use CAS-before-RAS refresh according to the manufacturer's data books that I have access to: Motorola, Fujitsu, National, Texas Instruments, Intel, Samsung, Hitachi, NEC.

I'm told that most brands of chips are designed to use this refresh mode, but ask

```
. XLSYS0S/FIX - To address 512K and use XLR8er special features. 21-SEP-89
. Written by Frank Slinkman, 4108-C Fairlake Lane, Glen Allen, VA 23060
. From dos READY, enter the command PATCH SYS0/SYS.LSIDOS USING XLSYS0S/FIX
. Must also patch boot/sys.lsidos using XLBOOTS/FIX
. Must also apply 512K hardware mods. See Misosys Quarterly vol IV.11 - RRK
. This code replaces M. Houde's XLSYS0A/FIX patch code (won't overlay it).
. New @MUL8 svc @ x'190A'
D06,F0=57 ED 5C 7B C9
F06,F0=C5 57 AF 06 08
. TASKER patch2. End of old @MUL8 @ x'190F'
D06,F5=ED 29 38 7C 32 02 02 C9
F06,F5=87 CB 23 30 01 82 10 F8
. Fix call to modified @BANK instead of svc @ x'1A16' (disk I/O)
D09,74=CD 77 08
F09,74=3E 66 EF
. Tasker, begins @ x'1C11'
D0B,97=67 CD D6 06
F0B,97=F5 21 78 00
. Tasker, ends @ x'1C3C'
D0B,C2=E1 CD 0F 19
F0B,C2=F1 32 02 02
. Special registers set up in initialization (SYSINIT4/ASM)
. Byte 9, next line = default mem waits: 40=1, 00=0, 80=2, C0=3 M-waits
D0C,D6=D3 84 3A 6F 00 D3 FE 3E 40 ED 39 32 ED 38 36 E6
F0C,D6=47 3E A7 0E 84 ED 41 21 FF FF 22 0E 04 22 1C 00
. Byte 3, next line = default refresh: 02=40, 00=10, 01=20, 03=80 T-states
D0C,E6=FC F6 02 ED 39 36 AF ED 39 38 ED 39 39 3E 88 ED
F0C,E6=56 36 55 ED 79 5E 77 ED 41 BE 72 ED 79 73 ED 41
. Bytes 3 through 9 inserted to mark BUR$ & BAR$ as "in use" - RRK
D0C,F6=39 3A 3D 32 00 02 32 01 02 18 09 00 00 00 00 00
F0C,F6=3E FE 28 02 3E F8 32 01 02 32 00 02 3A 6F 00 D3
D0D,06=00
F0D,06=FE
```

before you buy, and be sure you can return them if they fail. OKI does not work, unless they've changed later production runs. The NEC data book claims to have the feature. When I tried their D41256-15, I had problems on both the motherboard and the XLR8er. The NEC chips on the motherboard failed to maintain an IPL so I borrowed Samsung chips from my son's messDOS machine. Three hours and no failure later, I replaced U77 with one NEC and re-booted, then created a memdisk in the upper banks. I backed up the system to it, then started monitoring SYS13/SYS via LIST SYS13/SYS.LSIDOS (H <ENTER>). Sectors 2 & 3 should contain mostly x'00', but after a while I would see '00 00 80 80 00 00 80 80' etc. Swapping NEC chips didn't help. I'm using Samsung's KM41256-15. Intel gets their dies from Samsung. Care to guess where sixteen NEC chips now do their thing?

Ailing Hard Disk

From Adam Rubin: Can anyone help me with a hard drive problem? My recently ailing Radio Shack 5-meg hard disk now takes about 10 minutes of attempts to boot up (if it boots at all), and doesn't last more than a few hours at most before returning to its non-working state. It's a succession of ERROR 11H at both the start and the end, with the green light staying out (i.e. drive active) for several seconds or more for each error message.

Yes, I tried cleaning the air filter. Not only that, I opened the case up, scraped some more dust out of the fan and got any other loose dust out. That helped for a day or so. This started as an intermittent problem a few weeks ago, and I'm now almost reduced to a floppy disk system.

Does anyone know what the problem might be, and what I can do about it? Is it the controller, bubble, cable, or what? Thanks very much in advance for any suggestions!

Fm Bill Brandon: Adam, I had a similar problem with my 15 megger. Turned out to be a failed power supply. Fortunately, the HD uses the same 65w supply as the Model 4. Before changing out power supplies, you might do the Pink Pearl thing on the cable connectors at both ends of the cable to the HD. Dirt will sometimes emulate a host of other problems (the syphilis of the computer world? Better practice safe hex!).

Fm David Campbell: Adam, Had a similar problem with my 12 meg. My problem was a bogus cable. Seems that somewhere along the line it had been crushed, and caused intermittent failure.

Fm Joe Kyle-DiPietropaolo: Adam, The suggestions you've got are the right way to proceed. Disassemble everything (Well almost, I don't have to tell you to not take apart the bubble!) and clean all cleanable connections. Inspect all connectors and cabling for cuts, fractures and bent pins. The HD power supply is the same as the 4P power supply, so watch out for the power pin problems that Jim and others have reported. I'd re-solder the output pins for sure.

Once you've got everything spit-shined, let it warm up for a half-hour or so with the case top on, and re-do the whole format, including the low-level format. Take this opportunity to re-configure your partition sizes as necessary.

If the hard drive does not become stable, take this opportunity to replace the bubble.

Fm Adam Rubin: David, Thanks for the suggestion, Dave. I'd never considered a cable problem, since everything was

working OK until a few weeks ago, but I'll definitely look over all the cables carefully. I'd never realized how many possible causes there were!

Fm Adam Rubin: Joe, Thank you very much for your suggestions. I'm not much of a hardware hacker, so here's some elementary questions:

What's the best way to clean connectors? (I discovered an eraser only works on card-edge types.)

"Output pins" = output on power supply going to controller board and bubble?

TRSF6 (supplied with TRSDOS 6.2) does both the low- and high-level formatting, correct?

What about the DRUN adjustment (C33 on controller board) you discussed with Gary Phillips a while back? (Bob Haynes thoughtfully sent me a copy of the thread.) Does that have anything to do with this?

If I do have to replace the bubble, that's a Tandon 602S in there, I think. What brands/models would you recommend as "plug-in" replacements (i.e. no hardware mods needed)?

Answers from anyone would be greatly appreciated... thanks in advance!

Fm Joe Kyle-DiPietropaolo: Adam, For non-edge connectors, unplug and replug them two or three times, anything that is going to come off will. Don't be tempted to use compressed air on those header and socket connectors.

Right on the output power supply pins, also don't forget to check the actual voltages supplied. Spec is typically +/- 5%, but anything outside +/- 3% should probably be adjusted.

TRSF6 does do both the high and low level format. The software for some other controller systems (i.e., non-RS controller) does not.

Try adjusting DRUN as a last resort after you've tried everything else. Generally a DRUN problem won't generate Error 07 or Error 11, just long delays in access with the green light out.

Tandon bubbles:

TM501 5 Meg 2 heads 306 cylinders
TM502 10 Meg 4 heads 306 cylinders
TM503 15 Meg 6 heads 306 cylinders
TM602 5 Meg 4 heads 153 cylinders
TM602S 5 Meg 4 heads 153 cylinders
TM603 7.5 Meg 6 heads 153 cylinders
TM603SE 12 Meg 6 heads 230 cylinders

Replacing the bubble with anything will require tack-soldering three wires onto the replacement bubble.

As far as alternate bubble changes go, price is your biggest selection factor. If you are looking for minimum out-of-pocket expense, you can find refurbished Seagate ST225's for under \$150. That would get you twenty megs, and the drive could be used later in a PC.

Unfortunately, twenty megs is unacceptably small in today's PC market. If you can swing \$400, the Mitsubishi MR535 is a nice, fast (under 30 ms. vs. 85 for the ST225) drive that formats out to 44 Meg MFM and is RLL rated (resulting in about 65 Meg formatted). It's half-high, low power and considered quite reliable. This size drive with an RLL controller is the minimum drive size I'd recommend nowadays. My drive is this size and it is full without trying hard at all.

If you need to stay well under \$300, about the only choices are the Seagate 225 and its three inch cousins. For about \$300, the Miniscribe 3650 can be had, it's slightly faster than the ST225 (65 ms.), though not as fast as the Seagate three inchers, and has a formatted capacity of about forty megs. Of course, the three inchers will require mounting brackets or sheet metal work.

Fm Shane Dawalt: Adam, I've had a

Miniscribe 3650 for roughly 1.25 years. No problems at all. Works great. For the first year, it was continuously turning off and on. For the last 3 months, I decided bringing the HD up every day was stupid, so now it runs 24 hrs a day, 7 days a week except when I'm not at home for extended periods or if thunderstorms come lurking around. (42Megs formatted; 61ms access time)

Fm Adam Rubin: Okay Joe, I took the 5M HD apart, cleaned what I could, resoldered the output pins on the power supply (for me, that was the hardest part—on the other hand, it looked like it really needed it), and guess what? It seems to be working! I'm not sure what the problem was—it may have been the PS, or maybe that contact on the bottom of the bubble. I hadn't noticed how long it had been taking to get up to speed until I reassembled it. Anyway, I hope it is fixed.

Btw, what exactly are low- and high-level formatting? Does low-level simply write tracks and sectors with arbitrary data, and high-level write the directory and boot info in the few sectors where it's needed? (If so, I gather FORMAT (SYSTEM) would be only the high-level format for a HD.) Thanks very much for your advice (and indirectly from keeping me from panicking!).

Fm Adam Rubin: Thanks for the comment, Shane. Unfortunately, if bubble replacement does become necessary, I think my budget's gonna limit me to a Tandon 5, 10, or 15M bubble. Sigh. (A used IBM 3380 might be nice, but finding a controller is difficult.)

Is that an external HD, or do you usually leave the whole system on all the time? I asked about that a while ago, and I now generally turn the whole system on and off once per "session", typically once per evening. It seems to me that mechanical things, like the HD and printer, are slowly wearing out every minute they're on, whether active or not. Comments, anyone?

Fm Joe Kyle-DiPietropaolo: Adam, Sounds like you've got it licked (at least for now).

RE: low vs. high level formatting — yes, the low-level format is writing the tracks filled with gaps and sectors. The high level format is writing the directory cylinder complete with HIT, GAT and DEC sectors, plus the BOOT sector(s). So, a low level format will help with "sector not found" errors, but a high level format won't.

Most of the stress on a device like these occurs when it is goes through the process of being powered up from the off state. A hard drive is also stressed when it goes from the power-on state to the power-off state. As long as environmental conditions do not suggest otherwise, leaving things on is generally no worse than cycling power, and often can be less stressful.

That said, I generally follow a procedure similar to yours, that is, once I need to use the computer it is turned on. I turn it off when I go to bed or leave the house for work. Thus, the computer goes through one complete power-on/power-off cycle about once every twenty-four hours. I would avoid cycling power more often than that. I do turn the brightness down on the monitor if I anticipate being away more than a half-hour or so.

My computer at work, OTOH, has run almost continuously for about three years now. I don't have to pay the electric bill (directly anyway).

Fm Shane Dawalt: Adam, The main point I consider is "HD's do not like to be cycled and/or disturbed all that much". Since I am usually leaving and entering the house twice a day or more, leaving the machine running is better. The only moving parts in the computer are the cooling fan and the HD. Everything else is electronic. Electronic components do not wear out as fast as mechanical parts do, so I don't mind leaving the CPU running all the time. And no, the HD is internal.

The screen is turned off during the night. I had a problem with the screen a couple months back. A high voltage connector worked loose and started arcing on the connector. The connector became hot, melted and began to burn the board. The solution was to solder the HV wires to the board, but just in case any other connectors decide to repeat that adventure, I want to be at stage center to nip it in the bud.

The printer is usually off, but that's because it is not used often enough to leave running. Again, since nothing is moving in the printer, I wouldn't hesitate to leave it on. (There is a small current in the carriage motor and print head motor, but not enough to get concerned about.)

Fm Adam Rubin: Joe, What about things like the bearings on the HD? I'd think that wear on those would be zero while it's turned off, and non-zero while on, even if unused. Or would that be negligible compared to other factors?

One problem I've run into is that, essentially, I can't use the stereo while the computer system is turned on; the two fans plus the HD are loud enough to interfere with listening. (And I suppose I ought to be keeping at least the non-motorized audio components on all the time too.) Maybe a larger house is the answer?

Fm Adam Rubin: Shane, What would bother me most about leaving my system on all the time would be (1) the wear on the HD motor, bearings, etc., (2) the noise, and (3) the electric bill. Either the bubble or the fan in the HD is loud enough to interfere with listening to music, and slightly distracting the rest of the time as well.

On the bright side, I think I've just recently lost the ability to hear the 15KHz horizontal sync, so at least that wouldn't bother me. (Sigh...)

Fm Bob Haynes: Nooow laddie, dinna

fergit ta FORRRMAT (SYSTEM) after TRRSFORRM6 to collect yurr firree bonus cylinderrrs (Tandy's "service" cyls reen-abled)! (sound of pipes playing in background) -Bob

Fm Adam Rubin: Yes Bob, but will that work on the U.S. version of the HD? <grin>

Actually, I'd just as soon leave that "diagnostic" cylinder disabled; I don't know who'll be servicing my HD next, and I can afford to reserve 32K for that. Thanks for the suggestion, though; I figured that FORMAT (SYSTEM) had a use somewhere.

Fm Joe Kyle-DiPietropaolo: Adam, Making bearings survive the power-on hours is a known low-tech technology, hopefully the hard drive manufacturers have done their homework. Heads vs. platter surfaces is still proprietary black magic.

Bigger speakers and a bigger amplifier will allow you to make the stereo audible, but won't solve your missing dynamic range problem. Acoustically isolating headphones will do the trick with no power increase. An external antenna on top of the house with coax lead-in will kill the FM noise problem.

Model 4 power supplies

Fm Pete Granzau: A year or so ago, someone pointed out here that someone then advertising in the Computer Shopper was selling 32 W Astec power supplies, cheap, which would do admirably in an early version Model 4 with the two power supplies. Can anyone remember who was selling them, and what the model of the

power supply was? I have a need for one or more of them (Model 4 power supplies being what they are).

Fm Jim Beard: Pete, The Model 4 used 38 Watt power supplies which have three four-pin output connectors. Outputs are +5v regulated, ground, and unregulated +12v and -12v. The Astec part number was AA11320. The Tandy part number was 8790021. I don't have the CS vendor, but I hope this helps.

Fm Pete Granzau: Jim, I got a PS out of an out-of-use Model III a friend had, which was probably fine, as the disk interface in my Model III came out of that same Model III several years ago. I could find (c) 1980 Astec Components Ltd. and Made in Hong Kong on the front and a backward, connected UR (whatever that means), and 042 0325605 on the back, which doesn't seem very helpful. Okay, 38 W. I want to buy some extras, as this is like the third PS I've had go bad. No one in CS seems to sell anything but PC clones and parts any more.

Fm Bill Brandon: Pete, I believe the ad was from Jameco. I noticed it because of my rampant fear of running out of PS for my 4D. Unfortunately (or maybe not), the 4D uses the 65 watter. We have an event here in Dallas known as "First Saturday", sort of a flea market for electronics/computer junkies, which I regularly prowl looking for the 65w variety. They do show up there, along with the 38w ones. Usual cost is about \$15, less if I'm having a good hoss-trading day. Want me to pick any up for you next weekend?

Fm Joe Kyle-DiPietropaolo: Pete, Try both Timeline and Jameco, they have had them in the past, though I don't believe they are in their current ads. My current Computer Shopper has hit the bit bucket, so I can't check for sure.

Timeline is at (213)217-8912 and Jameco

is at (415) 592-8097. Note that the supply is nominally rated at either 35 or 40 watts, depending on who you talk to.

Fm Jim Beard: Pete, The third Astec 38W to go bad? You have another problem. Astec 38-watters are not particularly failure prone.

Fm Pete Granzau: Jim, That's four years and two Model 4s, Jim. And this is the first on this Model 4. Actually, it seemed okay while running, but took about five to ten minutes after power-on to actually permit the disk interface to work. Which was the only time I really use the disk interface, of course, as I have a HD...

Fm Jim Beard: Pete, What a pain. Did you find out exactly what was bad in either of the power supplies?

Fm Pete Granzau: Well, one of them had a loose capacitor, which I assume needed replacement. My skills are at the screwdriver level, not the soldering iron level, which means I trust myself to remove and install the PS, but I don't attempt to fix it. I do know a guy who fixes them, though he sounded supremely uninterested in my problem when I called him about it a few weeks ago (my solution in the meantime had been to keep power on the model 4 for that entire length of time). Which is why I was looking for a source for replacements in the first place.

Fm Pete Granzau: Bill, I assume your 4D and HD both have 63W power supplies. This was the smaller one from the older machine (I think I 'splained it above somewhere). On looking at the bad one, C13 is loose, so I assume that's the problem. However, as the guy I would have depended on to do something sounded so diffident about it when I talked to him, I have just decided to try to buy.

Fm Bill Brandon: No problem, Pete. Glad to help if I can.

I meant to mention this, too. Those power supplies can usually be fixed. If you look at a failed unit closely, you may find that the top of one of the capacitors is deformed. Replace that one with an identical capacitor, and you will have a working spare. (I'm referring, of course, to the cylindrical "can" type capacitors clustered in the center of the board.) Some power supplies have also been reported as failing due to defective materials in a trimmer pot on the board. David Dalager (who fixes my gear when it fails) has mentioned this problem several times in his columns in TRS-Times and TRS-Link.

The power supply now in my 15 meg HD used to be in my Model 4D; David replaced the blown capacitor and away we went. The one now in the Model 4D was provided by Bob Snapp, who has lots of these Power Supplies, both good and not good. I am now down to one spare, but knowing that a fix is possible makes me feel much better.

If you know Bob Snapp (hangs out on the TRS80PRO forum, owns and operates SNAPPWARE), or even if you don't, leave him a message. He generally has PS's available, for less than what Tandy wants. The 63 w supply is about \$60 from National Parts, no telling what the 38 w is. (See why I hang out at flea markets?)

Fm Jim Beard: Pete, By a loose capacitor, I presume you mean an electrolytic can capacitor, mounted flush against the board like a little oil tank. When those are loose, the leads have lost mechanical integrity inside the capacitor, which can happen with aging. It is a symptom of high heat. Are you keeping your computer sitting up on its 3/4" feet? Is the back at least 4" from the wall? The grille on the top MUST be clear and at least 4" from any shelf above the computer. If so, the computer should run plenty cool without a fan.

Fm Pete Granzeau: Bill, No way I go to

National Parts for something like this. I'll buy an out of use Model III first. But it appears I have a source here. First, however, check out the hamfest/computer show.

Fm Pete Granzeau: Jim, The 'pooter is up on its feet, no shelves about, nothing on the top except the plastic keyboard cover, which does **not** extend back to the air slots, but I have left the thing running for days on end many times. According to the PC board, the loose thingum was C15. Yes, like a little oil tank. I have taken to turning it off every night, now.

Fm Jim Beard: Pete, According to my book C15 is the biggest cap on the board, 2200 uf between +12 and ground at the output. This cap absorbs all the +12 ripple as AC current. Also, current surges from this cap start your floppies. It is likely that the video loading puts a lot of AC current loading on this cap, too.

The cap probably ran hot after it started to dry up. But, the hours on the cathode of the CRT are the best reason to turn the computer off when you're not using it. If you have a hard drive, hours on the bearings and the fan are also a consideration. I would have changed C15.

Fm Pete Granzeau: Well Jim, I found about the HD last spring, when the bearing froze. I now park the heads and turn it off every night. And, now that I know it will boot when I turn it on the next evening, I turn off everything else, too. I have a screen blanking utility, as well, but the CRT seems fine, so far. I've only had this one for about a year.

I don't think any video loading was on the capacitor in question, though. The power supply was on the disk interface, not the motherboard. But the biggest cap on the board is C6, at the other end of the board. And I mistyped, as the loose ones seem to be C11, C12, and C13, not C15. (three identically sized ones to the end of the board with the three output connectors).

Fm Jim Beard: Pete, According to my schematic, C15 is a 2200 uf, 16v capacitor. C6 is 100 uf at 250v. I don't have a board layout or other indication of physical size in my Tandy docs, but the 250v capacitor would be about the same size, it would seem. My docs show C11, C12 and C13 to all be 1000 uf 25v capacitors. These caps, along with C14 (330 uf 16v) are the first smoothing caps out of the diode bridge. The smoothing caps absorb all the ripple from the rectification operation, which is very high on a switching power supply compared to a 60 Hz job. These caps should be designed to take the stress of the circuit; this is part of the design specification process. However, electrolytics tend to get fragile when the temperature gets too high. 70 C or 160 F is very good for most electrolytics; it might get just about that hot in there sometimes. Better ventilation of the power supplies might be in order.

Fm Pete Granzeau: Jim, Thank you for the information. I fear fixing power supplies is really beyond me; my expertise begins and ends with a screwdriver! I think I have found a source for a couple of 38 W power supplies, I plan to make an offer shortly.

Model 4 Video Problem

Fm Ralf Folkerts: I need Help with my Model 4 Video !

I've just installed the Model 4 Upgrade Kit (Kent Fasick had LOTS of trouble when he ordered it for me and then sent it to the FRG) and it's Video got 'mad'. It seems like it's out of synch. In 64 Character Mode I can read what's on the screen, but it's on the screen three times. In 80 Character Mode there are only a light and dark areas to see! I hope that someone can tell me what's to do with that problem ! Many thanks in advance

Fm Jim Beard: Howdy, Ralf. Always happy to help a RATFOR customer. Hope you can read this (grin).

On the RCA board, the vertical hold is R612, a trimpot mounted back in the corner. Take the top off and lay it down sideways beside the computer. The horizontal hold is marked on the PC board down by the edge; use a penlight. Use a plastic alignment tool, the screwdriver end, to adjust the trimpot. The other end is useful in adjusting the horizontal oscillator coil, which is likewise marked "HORIZ. HOLD" on the board edge. Getting it right is just like adjusting an old black and white TV to get a steady picture.

If you have the TCE board (it has chips as well as transistors), the horizontal hold is trimpot VR301 and the vertical hold is VR201. They should also be marked on the board. I think that this board was used only after the Model 4 came out, so you probably don't have it.

Get the screen clear and stable in either mode. Then, switch modes and get it steady again. You'll have to go back and forth a number of times to get a good adjustment that is clear and steady for both modes. And, you'll need to adjust the brightness and contrast (the thumbwheels under the left side of the computer) when you switch modes.

Fm Ralf Folkerts: Jim, I've just done the adjustment (R612). I the got a steady 64 Character picture but the 80 Char. Display still was garbage. Then I remembered Fred Oberding's hints I read in TMQ III.iv, p. 82. I've adjusted C-210 and got a good picture. But: In 80 Char. Mode the last line too low to be read. In the 64 Char. Mode everything is OK! Can this be adjusted by R524 (Focus) ? Hope that was the last problem I have.

Fm Jim Beard: Ralf, About the same distance from the plug to the cable back to the main board is another trimpot, R617. This is the Vertical Size; it is also marked on the main board, if you can find it with your penlight and mirror. If I remember

correctly, this control affects the bottom of the screen mostly. This is good, because I don't think that there is a vertical position control. You may need to readjust the vertical hold. When you are through, fiddle with the combinations of the brightness, contrast, and focus to get the best performance in Model 4 mode. I wrote a BASIC program to fill the screen with periods, "x"'s, "+"s, etc. to do that.

Fm Ralf Folkerts: Jim, OK - R617 worked. I got all lines on the display. But is totally out of center. I have a few cm 'darkness' on the top of screen while the last line is just about the bottom of the CRT! Is there any way to adjust the position of the picture from bottom to top ? I read about adjusting the centering rings in the Tech. Manual — but the Video Board is something where I won't do anything without having asked twice. Hope that you can help me and that the Video will soon be OK! Btw. Is it OK when I have to bring down the brightness when going from 80 to 64 Char. Mode?? With my 4p (green screen) that is NO problem! Ahh: How can that Video Problem arise? It worked all OK when it was a Model III. After being upgraded to Model 4 it starts with problems!

Fm Jim Beard: Ralf, Adjusting the screen brightness is normal on a desktop Model 4 when you go from Model III to Model 4 mode. I also have less adjustment on my 4P when I do that; I dunno why. Maybe the 4P video has some compensation built in.

The centering rings are on the CRT. You will need to loosen some clamp screws to adjust them. Be VERY careful when messing with the neck of the tube. OSHA safety rules would have you wear welder's gloves and a motorcycle helmet while messing with a CRT from the rear, and for good reason. That's why I didn't say anything about the CRT up to now. But, the centering rings and the front-to-back position of the yoke can affect focus and the uniformity of focus over the screen.

The docs for adjustment of the CRT are

on page 146 of the old Model 4 Technical Reference Manual (26-2110).

Model I/III/4/4D Video Service Adjustments, from P. 146 of 26-2110. Observe standard safety precautions when working with any CRT: eye & face protection, gloves, and thick lab apron or other protective clothing. CRT may implode without warning or apparent cause.

Measurements should be made using a 12.0 VDC input. The ground strap on the CRT is necessary to prevent normal tube arcing from popping the video board. Lay the computer top sideways to the left of the computer and plug the video cable back in. Check the +12v, ground line, and 2 amp fuse before proceeding with adjustments.

FOCUS—Adjust focus control R524 for best overall focus.

VERTICAL SIZE—Adjust vertical size control R617 to produce vertical scan of approximately 6 inches.

HORIZONTAL LINEARITY—Loosen deflection yoke clamp (observe precautions) and slide linearity sleeve (a sheet metal magnet on the CRT neck under the yoke) forward or backward to equalize character spacing on the left and right sides of the screen.

WIDTH—After adjusting horizontal linearity, adjust width control L504 to produce horizontal scan of approximately 8 inches.

CENTERING—Adjust centering rings on deflection yoke assembly to center display on screen top to bottom and left to right. The centering magnets are on rings attached to the rear of the yoke. Small tabs at about 10 o'clock and 2 o'clock are used to gently rotate them. Use a mirror to observe the front of the screen.

HORIZONTAL HOLD—The horizontal hold is the adjustment on the horizontal oscillator coil, L501.

Fm Jim Beard: Ralf, There are several reasons that the video board could react

differently to the Model 4 board. The synch signals are different, so the centering of the vertical and horizontal hold might be different. So, a perfectly good board would need readjustment. After readjusting the vertical hold, the vertical size changes. The verticals size control changes the vertical position. This is probably the main reason that Tandy does not consider the upgrade to be user-installable.

Other possibilities are problems with the power supply, cable, fuse, or video board that come to light with the mechanical jiggling involved with rebuilding the whole computer. Or, one or more of the video board controls might have been disturbed somehow. But, your experience is not too different from mine, except that I just piled right in and reworked the video. I have some TV repair experience, including replacement of picture tubes.

Fm Ralf Folkerts: OK - I thought that something gone TOTALLY wrong with the board! It 'refused' to work first because of a loosen cable (one of those that are wired wild over the pcb) - I had a 'little' short-circuit experience. (What a power supply - it sounded a bit different, but no fuse burned (but I turned it off VERY fast))

Fm Jim Beard: Ralf, I would go ahead and do it, just be careful. Wear glasses or goggles. I feel I must include the warnings to be fair to you and others who might be reading this and not know about CRT's.

A shorted out TRS-80 power supply will just shut down and wait patiently for you to find the problem. A solid short circuit won't damage it.

Fm Ralf Folkerts: Jim, I did it! From the local Energy supplying company (where my daddy has contact to a few people) I lend the equipment they use for 20,000+ Volt line-repairs (thick leather gloves, leather clothes and a helmet)! Was no problem to adjust. Now I have a SUPER

picture.

A little drawback. After I tested disks, RS-232, Video etc. I rebuilt the case around the machine. Turned it on and ... had to re-adjust the disk controller. Don't know why, but it was out-of-alignment. But now it's running — (how long???)

Fm Jim Beard: Ralf, Between your precautions and your success, you have MADE my day. Now, I'm going to take the week-end off.

Fm Ralf Folkerts: Jim, I can't tell much about that! The 1.4 Volt was too low, the 2 MHZ signal wasn't 2 MHZ (but the Precomp was OK — 200ns)! That is the same board on which I had to replace to ... chip a few months ago! That time I've adjusted it! Hope that it will run now for a loooooooooooooooooong time without need of re-adjustment!

Fm Jim Beard: Ralf, I gave mine the same treatment you just gave yours and haven't had a disk error since. That was in 1983 or 1984 or something.

Model 4P Video

Fm Bob Haynes: I finally discovered the cause of my 4P's video "shake"!

Much ado has been made of problems with the solder joints on the power supply boards where the output pins are located. But it's very easy to overlook the harness pin connectors!

In the 4P, the p/s connector is well out of the main flow of ventilation. Of course, it shouldn't heat up at all, but a bad connec-

tion produces resistance and will cause heat to be generated. This tends to weaken the spring tension of the female connector. The weakened tension causes an even poorer connection, resistance increases, and the problem worsens. You go in, look for the problem, wiggle the wires and the problem disappears. And because the 12v video connector pins are different than the others, they are especially susceptible. You can't determine the problem without actually removing the pins from the plastic connector housing.

After this problem became a nuisance on BOTH my 4Ps about a month ago, I really HAD to do something! Eventually I ended up removing the pins, cleaning them with pink pearl and alcohol, then bending them slightly with a small needlenose for more tension. Problems have completely disappeared in both machines. Hope this helps some of you 4Pers out there.

Tandy 2400bps MODEM

Fm Don Bird: I am having an interesting problem with a 2400 bps half card modem. It is a Tandy product and I am using an original Tandy 1000. When I type "ATDT<number>" the phone picks up and I can hear the dial tone on the modem speaker but the message: NO DIAL TONE comes up and I am disconnected. I thought it may be a problem with the modem so I exchanged it for a new one and the new one does it too. Has anyone else had this problem?

Fm Louis Self: Don, Get a regular telephone with a double-female connector and check out the line that you have hooked to the modem. I had a cable with an open wire once. This is so simple and easy to check that it is worth a try to eliminate the possibility of a bad line connection.

Fm Joe Kyle-DiPietropaolo: Don, You might try disabling call progress detection, if the telephone company or PBX you are connecting through is "off" in terms of dialtone frequencies. Probably one of the ATX or AT&X or AT&W commands.

More Power supply fixes

Fm Ted Haigh: I have finally come up with a method of totally curing the screen problems on the Mod4 with Hi-Res graphics. You may remember that I had a thread here awhile ago about my screen expanding, shrinking, expanding... when the Hi-Res board was drawing??? Don't remember no problem!! What was happening was that the Mod4 Power Supply was going into "Current Limiting Mode", this is to protect the supply from burning up from trying to pass too much current to maintain the system. I have added almost everything you can think of to my Mod4: Hi-Res, XLR8er, Hard-Drive, Extra Floppies, and all of these take a certain amount of power from the internal Power Supply, so when all of these are being powered and one wants more juice the supply tries to supply but often it just couldn't, so to make a long story short I tried to bolster the supply in the machine by doing some redesign of its circuits, but no help, so I got a second 65W PS from the guys at the Pacific Computer Exchange, and now from one of these supplies I run the Floppies and video, and on the other supply I run the main mother board. With this set up I have no more problems with the screen or anything else. If you would like I could get together a small file showing how to do this conversion yourself, so leave a note.

Fm Bill Brandon: Ted, I seem to recall

that the 65w power supplies will actually provide substantially more power if you just take the simple expedient of cooling them. That is, if you install one of those little muffin fans. I'm not an engineer, and have not done this myself, so I don't know if you would want to blow air into the case, or exhaust air from the case, or if this makes no difference (I worry about dirt collecting in the case). In fact, I have seen ASTEC power supplies with a little note on them indicating higher output if external cooling is applied.

Maybe one of the hardware hackers here could clarify things.

Fm Joe Kyle-DiPietropaolo: Sure, I'd like to see a file on this. I would think that one of the small 35 watt supplies would also be adequate to supply the motherboard, as Tandy used to use one of those for the motherboard, RS-232 and video, plus a second for the FDC and two floppies.

Fm John G. Gelesh: TED, Sounds great to me. I am very tired of my Model 4D's flakey video.

Fm Ted Haigh: Yeah it really is nice to have enough power to run all the added extras with some to spare. Be sure to hunt for power supplies at other places than Radio Shack, they are asking about \$100 for a new supply for the Mod4 I think with a little shopping you could get a whole Mod4 for that price. There is lots of extra room inside the computer so mounting the supply inside is no problem. A good source for the supplies is the Pacific Computer Exchange, in Portland Oregon 503-236-2949.

Fm Ted Haigh: Bill, The Astec supply does state that with no cooling you get about 55W of power for the full 65W you need to cool it, this is also the same for the Radio Shack supplies. So instead of trying to fiddle around with installing a fan, I

just put in another supply. Like you said I don't know, or want, the dirt in my system, or know what problems it might cause (Great grammar) You could run a fan on the desktop version of a mod4, but you may have to do some cabinet renovation to get a good air flow, it's much easier to just put another supply in the large empty space under the CRT.

Fm Ted Haigh: Joe, I don't know if anyone still sells the 35W ASTEC supply?? The Pacific Computer Exchange could probably let you know if any are still around since they deal with lots of old RS hardware (That's where I got the second 65W supply from). But sure a 35W would run the mother board fine, that is if you can find one, and it will be a bit smaller too! Ok I'll get a file together about adding the extra supply, and maybe if I get real ambitious I'll add a few Hi-Res drawings too.

[I have uploaded a file, POWERFIX/ARC, to the LDOS forum on Compuserve] on adding a second power supply to the Model 4. It has been created using the new ARC4, so the files are crunched; you need to use XARC4 or the new ARC4 to extract them. Included is a text (ASCII) file on the addition, and a Hi-Res picture showing most of the connections, use GLOAD/CMD, or some similar Hi-Res picture loader to view this picture. For the people without a Hi-res board there is a program that will allow you to print a Hi-Res file to an EPSON printer that I will hopefully find in my archives soon and upload, keep checking.

Connecting two modems

Fm Bob Haynes: Fellow Hardware Hackers, For purposes of testing a special *CL filter, I need to be able to connect two 4Ps via two modems at one location. Straight

RS232 connection via null-modem is no help, as the filter actually talks TO, not just thru the modem, and expects actual modem responses.

I have only one phone line here and am not about to install another (even if I could; the NYNEX strike being what it is!) Can anyone suggest a Q&D way to simulate Ma Bell's central office between these modems?

Maybe I'll have to write a "modem-simulator" program for the remote 4P and run null-modem, after all.

Any suggestions appreciated...

Fm Pete Granzau: Bob, Just connect the two modems with the phone cord (no central office necessary). Use ATA at one end and ATO at the other if they're Hayes compatible to get them to talk to each other. You need a term program at each end, of course.

Fm Bob Haynes: Huh?? As simple as that? I figured the phone side of modem electronics had to be passive, only modulating the current provided by ma bell, the way a telephone does. Figured there had to be an external current source. I'll try it.

Fm Joe Kyle-DiPietropaolo: Bob, That kind of thing (connecting them together with a phone cord) will work with real Hayes modems and most clones, but not all. Another thing to look out for is to make sure that if the modem has call progress detection, that it is disabled. This is usually one of the ATX command variants. Otherwise, all you'll get back when attempting to dial is "NO DIALTONE".

Hi-res Graphics boards

Fm Jon Roberts: anyone out there that can give some info on the differences of the RS and microlabs hires boards, and your preferences and why. I'm trying to decide which to get. Please help.

Fm Frank Slinkman: Jon, Differences between RS and uL hi-res boards:

1. RS board has 32K; uL has 20K. Extra memory on RS board has never, to my knowledge, ever been utilized by any commercial application, and it's use is not documented (although I know how to do it).
2. RS board can normally only be written to during the monitors vertical blanking pulse; uL board can be written to during both horizontal and vertical blanking. Since 20 out of 100 character times are horizontally blanked and 16 out of 256 line times are vertically blanked, this makes the uL board theoretically 4 times faster than the RS board. In most applications however, the apparent speed is 30-40%, since it's only writes to the board which are faster.
3. Text screen/graphics screen is possible on both boards, but not documented on the RS board. I prefer the uL approach to text overlay.
4. RS board always displays 640 x 240, even in Model III mode. uL board shifts to 512 x 192 in M3 mode when text overlay turned on (640 x 240 in M3 mode with pure graphics).
5. uL board is cheaper and better supported. RS board costs more, and there is no support.

Recommendation: get the uL board (presently on sale for \$99.95) to get a better, faster and better supported board than an RS board which they want a mere \$219.95 for.

Fm Jim Beard: Frank, The extra memory on the Radio Shack HR Graphics board is documented in the manual. See the section on storing and retrieving pixels.

Printers

Continuing saga...

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Printer Problems

The following may be of interest to TMQ readers.

In past issues of TMQ, and in other publications, I have seen readers' letters describing a problem on dot matrix printers, where one or more head pins misfire consistently, leaving a thin horizontal white line throughout the printout. When a lower pin is at fault this spurious blank line affects underscore or descenders. When it's a central pin the body of each character is affected and when it's a higher one the tops of letters (such as upper case ones) are affected. The problem is also very noticeable on graphics work.

This fault may be due to a broken or damaged pin, a pin return spring which is broken or a jammed pin (it could also be due to a fault in one of the electromagnets, in the head traveling cable or in the electronics, although perhaps less probable). Unless the printer owner is conversant with details of how the print head works, (s)he may decide to, or be advised to, change the print head.

A friend recently had this problem on a Tandy dot-matrix printer. He consulted a

service shop who told him the head had to be changed. I suggested he ask the Tandy Parts people for the price of a head and they quoted around \$200; the Printer was some two years old and he had paid about \$700 for it, so the price of the head was working out at about one third the cost of the machine! A bit steep, we thought.

So I took a look at his printer; after some testing, I thought back to my own experiences with clogged head pins (TMQ III.iv, pages 78/79), so we removed the head to take a closer look. Sure enough, the pins were clogged with gummy ink debris which, as had also happened to me, was the result of reinked ribbons perhaps containing excessive ink. One of the pins, the cause of the white streak, was clogged solid.

We cleaned off the excessive ink from the head snout and then soaked the snout in isopropyl alcohol as described in my TMQ writeup. After a thorough cleaning, the head was reinstalled and the thin white line, due to pin misfires, had disappeared completely, evidently showing that the only problem was a pin that couldn't fire due to clogging with ink debris.

This head was a particularly bad case of clogging due to ink. Actually, this machine had never been cleaned or serviced. When the head was removed and turned upside down, the pins were visible in the portion leading from the body that contains the electromagnets to the snout tip, where they gradually converge towards the snout. Well, in that part there was also ink debris that had managed to work its way in and contribute to the clogging, which was also easily flushed out with a small brush and alcohol.

As it happened, my friend got an easy and free solution. If it had been a case of, perhaps, a broken pin or return spring, he would probably have had to buy the complete head. I checked in my own DMP430 service manual and find that parts for the innards of the print head are not listed. If this represents the trend, perhaps such inner parts cannot be obtained for this or other heads, and the failure of a small part means bite the bullet and buy the complete head. And asking a shop to disassemble to change a small part, even if available, would un-

doubtedly be as expensive as changing the head due to the labor involved.

The last word...

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Printer Problems

In several letters, some of which you printed in TMQ, I referred to problems caused by pins on dot-matrix printers jamming due to accumulation of ink residue, and I also described cleaning methods to alleviate this.

Maybe at this point you will think I am beating the subject to death; well, the subject has almost beaten me to death, so I hope I have finally got it straightened out and that this will be my last writing on the subject.

Until recently I thought, whenever I encountered the problem, that pin jamming could be due to overinking of the ribbon; now I have found, after considering my latest experiences and the experiences of several friends, that there may well be still another cause, particularly when frequent head cleaning is necessary.

There are various kinds of fanfold paper on the market, and I have found wide variations in prices and qualities. There are cheap ones sold at discount (I have seen some at around \$10 per thousand 8-1/2x11 sheets, 20 lb.) and from there on prices and qualities increase over a wide range. Some cheap papers shed debris in the form of a white powder which, after a few hours use, can be seen deposited in the printer.

There are several ways to renew ribbons: Buy a complete new one (with cassette) each time (expensive!), buy ribbon refills if your cassettes are refillable (not as

expensive but perhaps around \$5 each or something like that) or reink existing ribbons (the cheapest method if one has a reinker, about five cents each time). I prefer the latter method and use a reinker supplied by Computer Friends, Inc. (14250 N.W. Science Park Drive, Portland, OR 97229, (503) 626-2291), which works very well.

In order to nail down the variables of the problem of gummed up pins, several friends and I organized ourselves into a research team and conducted a series of tests using various papers and sources of ribbons.

Many dot-matrix ribbons have a longish stationary cassette running almost the length of the machine. At manufacture, the ribbon has a 180-degree twist put in it so a given point on the ribbon, the first time around, may face the paper; after the ribbon has gone full circuit through the cassette, the next time that particular point emerges it is facing the opposite way, towards the pins. If a point strikes the paper on the first lap and collects paper lint under the pressure of the pin impact, the lint may form a paste with the ink, and on the next lap that paste is hit by the pins which get gummed up; after several times around, the ribbon may be coated on both sides with paper-ink paste, which could also reduce the yield of printable characters of the ribbon.

The tests we ran involved over one hundred pages of printout on each of five participating machines in an attempt to provoke failures due to jammed pins. All tests began with a thoroughly clean head. Here is a summary of the results:

1. Brand new ribbon as supplied by the printer manufacturer (i.e., not yet used nor reinked); good quality lint-free paper: No problems whatsoever. Head very reasonably clean after more than one hundred pages of printout.
2. Ribbon supplied by the printer manufacturer, reinked (after it had run dry) one pass through the reinker; good quality lint-free paper: Same results as item 1.
3. Ribbon same as item 2 but reinked two passes through the reinker instead of one; good quality lint-free paper: Same results

as item 1, but some sheets printed slightly unsharp and tended to smear in handling, revealing some ink excess. Heads somewhat dirtier than in item 1.

4. Brand new ribbon, as in 1; cheap lint-shedding paper: Head quite dirty and gummed up with ink debris; several problems due to jammed pins.

5. Reinked ribbons, as in items 2 and 3; cheap lint-shedding paper: Same results as in item 4.

All reinking was done with black ink supplied by Computer Friends, which, judging by its specifications, is among the best available.

These results seem to indicate that, contrary to my previous suppositions, the problems with pin clogging are due much more to the ink-paper paste produced by the cheap papers than to excessive reinking, so the villain may well be cheap linty paper. In any event, even when using good paper, careful judgment should be used when reinking so as to have enough ink to work properly but no more. Evidently an overinked ribbon will neither help the pins nor contribute to a sharp printout.

I used to think that ribbon refills, obtainable for some machines, might be a good thing to use at times. However, some experiences I have had with certain refills from printer suppliers have rather dampened my enthusiasm. I and others have encountered the following on some brands: First, the refill ribbon comes packed in several layers of cardboard; if one keeps a refill some time, perhaps a few months, the cardboard soaks up ink (it is bare uncoated cardboard which is in contact with the ribbon) and eventually when the refill is used the de-inked part, where absorption occurred, prints out much weaker than the rest. Second, the refill has a ribbon leader outside the cardboard wrapping, used for threading into the cassette during installation. In several cases, that leader came wound around the protective cardboard, creased and crumpled; around it all there is a (usually tight) rubber band. After a time in storage, that puts almost permanent creases in the fabric so when the creased part comes to the

print head, there is improper contact and printing is faulty; and when the ribbon is put through the reinker, it doesn't make proper contact with the inking head at the creases and again produces defective printing. So I have quit using refills and now use only new ribbons as in item 1 above and reink per item 2 as needed. A ribbon will allow so many reinkings that, with only a few ribbons on hand, one will probably have enough for several years.

These comments on refills do not apply to the ones provided by Computer Friends, which I have not yet used but will probably try if I ever need them.

The problem in all this is that, once one discovers or suspects that the paper-ink paste is the villain and one's ribbons are contaminated with it, one has to get rid of the contamination on all ribbons which were exposed to it. The possible solutions are: First, if you have the time, patience, dirty old clothes to wear and a suitable place to do it, and are not averse to messy jobs, remove the ribbon from the cassette (if your type of cassette so permits), or pull as much out as will come if you cannot open the cassette, and dump the ribbon in a container of isopropyl (rubbing) alcohol and alternately let it soak and swirl it around, changing the alcohol as necessary until reasonably clean. Be careful, the alcohol is flammable; also take care not to splash it around to avoid stains; then hang the ribbon up to drain and dry thoroughly and rewind into the cassette and reink; the alcohol container is subject to staining, so use something discardable like a clean tin can. Or, second, if you can get good refills without the above faults, use them. Or, third, simply dump your existing gummy ribbons and get new ones and reink them (or use good refills) as they dry out. And, obviously, quit using linty paper.

As a comment on all the above: Specifications for good quality ribbon ink show the presence, among others, of mineral and vegetable oils, surface active agents and lubricating oil additive. They also possess a high degree of lubrication and absence of gummy residues, all of which favors operation of the pins. BUT, let's keep it that way. No one says we can mix paper lint in with it! A ribbon contains about a

thimbleful of ink, so it only requires a small amount of contaminant, such as paper debris, to affect it appreciably.

Bear in mind that, whatever ribbon renewal system you may use, and however good the paper, you still have to clean the head from time to time as part of a regular printer cleaning schedule.

XLR8er

Possible fix for 26-1069

Richard King
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While debugging XLR8er installation problems on my favorite Model 4 (with Revision C board modified to use 256K chips) I decided to test it in a second, unmodified Rev. C machine I have. The following observations may be helpful to others who have tried to install an XLR8er and have failed, or who are not sure if they should try.

Mechanically speaking, the XLR8er has one of the best printed circuit boards I've seen in a long time. It appears to be constructed in four layers, compared to the usual two layers found in the likes of Model 4's and most commercial products. IBM uses this multi-layer technique for their large computer products. In this type of construction, the two inner layers carry the voltage(s) and provide a cross-talk isolation barrier for the outer layers which carry the signals. Cross-talk between signal lines becomes a bigger problem as processing speeds increase and spacing between printed circuits decrease. When voltage busses run parallel to signal lines, they have a tendency to pick up and transmit their neighbor's information

to the logic chips they service. Many layered boards reduce or eliminate this problem. While the Model 4 motherboard should have no trouble handling 6 mhz., it's nice to know that some real planning went into this aftermarket product. Thought you'd like to know.

Not all 64K memory chips are created equal. My "plain" machine was running for the longest time with OKI M3764A-15 memory chips, using the Z80-A processor. Never missed a beat. When I popped the XLR8er in it and booted up using an unmodified LS-DOS site diskette, the date prompt displayed and my input was accepted, but the time prompt did some wacky things. Mash the orange button. This time the date prompt went crazy. Mash it again. Now the machine went off into never never land with the diskette twirling forever. Pull the diskette, shut off the machine and wait 20 seconds, turn it back on. No good. (I later discovered that the twirling diskette was being written to, rendering it useless for booting. Thank God it was created specifically for this test.)

Not all 256K memory chips are created equal. In my article on taking the Model 4 to 512K I mention that the NEC D41256-15 chips wouldn't work in CAS-before-RAS refresh mode. That's not the only place they failed. They would "fade" when used on the XLR8er board, in either of my machines. Changing refresh cycles to 10 T-states and M-waits to 3 didn't help.

With the XLR8er installed in my 512K machine, about three hours into an IPL (this time period varied) the machine would just take off for left field. The screen might suddenly go ape. Sometimes it would appear to be in Model III mode, other times it would add or delete characters. Also, the keyboard would go dead, DOS commands would fail to execute, and so on. You name it and I may have experienced it. Determined to find the culprit, I started by swapping all the HALs and PALs plus the video controller from the "plain" machine to the 512K unit, since I felt that trying to shoot this one with a scope should be my last resort. Ran 24 hours without a hitch. Interesting. Who to blame first. U58 and U59 are heavily involved in accessing all aspects of the

machine, so I restored these two chips. In less than two hours I had the failure. WOW! Replaced U58. Ran overnight again. Could there be an interaction between U58 and U59? Restored U58, replaced U59. Nope. Couldn't get through a TEST/JCL setup file I was using for this debug session. Must be U58. Swapped it with one in another machine I have access to, a no-Revision unit. Runs like a champ. Restoring the remaining original chips did not degrade performance.

What're the big signal lines on U58? *CAS, *MRD and *MWR. All have to do with reading and writing memory.

Permit me to bore you with some diagnostic observations. Each of the 20 pin socketed chips is either a HAL-type or a PAL-type. Most of them have a (mask?) code stenciled on the belly, where you don't normally look for it. If it's a PAL, the code will start with a "P", HAL codes start with an "H". In my machines, here are the codes I saw:

Socket No-Rev. 512K Rev. C 128K Rev. C

U3	P326F	P326FV	P326FB
U4	P320F	H5403A	H5403A
U58	none	H5373B	H5373C
U59	P820F(?)	H5370A	H5370A
U72	none	H5721(?)	Yellow ink on top surface

Dates stamped inside my two Rev. C machines indicate that they were probably built within 30 days of each other. Hey, take it for what it's worth. It appears that these HAL's and PAL's may be working at their limits (touch them; at 4 mhz. they're running hot) and a marginal chip may be causing some problems. Tandy may have felt some uncertainty about these chips too. (Why else would they be socketed when Tandy cut corners in so many other places?) Since I'll probably never install an XLR8er in the no-Rev machine, you know where the marginal chip went, along with a reminder to replace it before I XLR8 the machine.

Eram Disk

Fm John Metzger: I understand that a patch has been developed that allows the ERAM Disk to soft boot without losing data. If this is so any information on the patch would be appreciated. Also, in referencing a message posted on 9/22 it appears that difficulty has been experienced when installing drivers on System 0 and Boot System. Do the new patches work?

Fm Frank Slinkman: No John, the patches were to SETX/CMD and BOOT/SYS to change the initial HD64180 settings from 1,1,40 to whatever, and to remove an unnecessary wait state from the refresh cycle. I know of no patch to suppress rewriting the ERAMDISK directory to preserve the data after a boot. I would imagine that would be difficult, and might require a separate routine.

Back when Michel Houde' first released his patches (through TMQ), some people found they conflicted with HD drivers, etc., both competing for low RAM.

Fm David Huelsmann: John, Unless I completely missed the point of your question about "soft booting" ERAMDISK without losing data, that capability already exists. Assuming by "soft boot" you mean an unexpected hardware reboot or pressing the orange reset button WITHOUT turning off the main system power?

If I am correct, then the reinstallation of ERAMDISK without formatting will bring-up the data in the ramdisk again. I've done that many more times than I care to count - always successfully.

Fm Frank Slinkman: David, Not on my system! Reinstalling ERAMDISK without formatting always gives a directory

with only BOOT/SYS and DIR/SYS. The data is still in RAM, and in emergencies I've had to LDIR it from > 0x8000 to below 0x8000, and then DUMP it. A real PITA.

Fm David Huelsmann: Boy, that's a real drag! What's different between yours and mine?

Fm Frank Slinkman: I dunno. Whenever I try to use the FORMAT=NO parameter, I get a message something like:

ERAMDISK not formatted! ERAMDISK not [implemented — or whatever]

Fm David Huelsmann: OK, Frank, this is what I did to set-up the ram disk.

First, I created the disk in the regular manner and copied all of the files I wanted into it. In my case, I was making it a system disk, so I transferred all the /SYS files plus a lot of others I wanted in a ram disk. Once I had completed that, I dumped the entire ramdisk out to a floppy file called XMEMDISK/RAM. From then on, when I first brought up the system, a JCL file would do the following:

```
eramld xmemdisk:0 (l,bank=3)
eramdisk (d=4,b=3,f=no)
move6 :4
```

That would load my core image file into the ram bank areas and then initialize the eramdisk. The move6 would then exchange DCT between drive 4 and 0 giving me a system ramdisk as drive 0.

On a re-boot, I would simply do the following batch file (without loading the CIM file) and I was back in business:

```
eramdisk (d=4,b=3,f=no)
move6 :4
```

Is that similar to your method?

Fm MISOSYS, Inc: Frank, I tried to bring up a rebooted ERAMDISK using the F=N parameter and had absolutely no problems. I even copied a few files into it before I rebooted and verified that the files were there after reboot and reinstall of the ERAMDISK.

So anyone who can't get it to work must have some local problem. One thing to do would be to hope that those with the problem have PRO-WAM and MisterED. Then after rebooting, one could use MisterED's MED utility to look at what is in the extra banks. Perhaps that information would start pointing a finger. But I have no problem and there is apparently none in the ERAMDISK software.

Fm Frank Slinkman: Roy, The data in the ERAMDISK is fine. More than once I've had to go into DEBUG, LDIR the data from a high bank into low RAM (below 0x8000) and dump it to disk. I've heard others complain of the same problem (notably that character from the Peoples Republic of Marin County). It *is* kind of a PITA, though.

Fm MISOSYS, Inc: If the data is perfect, then how can there be a problem? If you have PRO-WAM and MED, then I would pop open a window and look at the directory of the area of RAM (i.e. look at the area of RAM where the directory of the RAMDISK would be. Check it against what it should be. Or better yet, step through the code of ERAMDISK. I can't step through it because I don't experience the problem

Fm Frank Slinkman: Well, I have finally nailed down the reason(s) why the ERAMDISK (F=N) parameter won't work on my M4 gate-array. Actually, there are two reasons:

1. The fool program looks for the disk name of 'ERAMDISK.' If you change the name to anything else (PROMRAS, for example), no way Jose'. Now, when the disk is "properly" (according to Michel

Houde') named, the F=N parameter works if (and only if) the eramdisk was disabled via ERAMDISK (OFF).

2. Something is happening to the refresh on my machine virtually every time it is rebooted, whether a hard or soft reboot. In banks 0 and 1; addresses on each page virtually always affected are 04, 78, 84 and F8. Often affected are 71, 75, F1 and F5. Other bytes are altered at what seems to be a random pattern. In banks 2 and 3, the affected address are 71, 72, F1 and F2. Usually all 4 bytes on each page are changed, but sometimes just one pair or the other on consecutive pages, alternating (i.e., 71 & 72 on one page, F1 & F2 on the following page, all 4 on the next page). Banks 4 - 11 (XLR8er memory) are not affected.

Thus, using the technique I described to recover lost files worked **only** because those files were in XLR8er memory. Had they been in standard memory, they would almost certainly have been trashed.

I suspect this may also account for why I can't run in M3 mode — that some jump vector or other value the OS expects isn't right.

So — what's the answer? Any of you hardware gurus have any suggestions?

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