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EDITORIAL COMMENT

For those of you who are affectionados of Vern Hester's MultiDOS and have a CN80 ROM Clock or I/O Bus Clock installed and want to use the clock with MultiDos on your Model 4, Vern has created a utility that works with the CN80 ROM Clock and I/O Clock when you bootup with MultiDos. If you would like a copy of this utility send the usual $2 to cover postage, the disk copying.

New IDE hard drives of 40 megabytes, the size best suited for use with the Model 4s, are becoming harder and harder to find. We can find some rebuilts at a smaller price than new (about $15 less), but they do not carry the original manufacturers 1 year warranty. But we did find a stock of new, fully warranted 40 meg. drives recently. We do not know how long this stock will last. So if you are considering a new hard drive for your model 4, don't wait, consider it now.

We purchased a large quantity of new 3.5" Sony disk drives that can be used in your Model 4s as 720K drives. These drives are on sale during our February Special sale. Sony was the original developer of the 3.5 drive and these drives carry the full factory warranty. We know that there are cheap drives that are rebuilt or drives that have been pulled out of factory overstocked computers. These drives generally carry no warranty, or only 45 days. When we ask those who are selling these liquidated drives we usually receive the reply of "Well they are tested and they are working when they leave here." Not very assuring, when for a few dollars more you can have the manufacturer and CN80 provide you with the protection that you need in safeguarding all your important data stored on floppy disks.

There are some rumors floating around that the Load 80 programs that 80micro Magazine used to sell have been placed into the public domain - they have not been placed into the the public domain - they are still copyrighted by IDG Communications, and only the originals are legal.

FEBRUARY
1995

ADSUBTME/BAS

A TRSDOS 1.3 BASIC PROGRAM

by Henry H. Herrdegen, 1994

(See program listing number one.)

If you ever had to add the minutes and seconds which are sometimes listed on a music tape, or had to do some other minutes and seconds additions, you will know how I felt when I had to do quite a bit of that. Fed up with the mental arithmetic, I wrote a short 12 line program, which made my job easy. Then I thought why not add subtraction, and let the TRS world know about it. That was easy too, added only 8 lines, and here it is.

You simply type the hour, a colon, the minutes, a period, and the seconds at the prompt, the latter two with 2 digits, leading zeroes where required. It is not necessary to prefix zero hours or zero minutes, MM.SS or just SS will do. To add, no "+" prefix is necessary or even allowed, to subtract the "-" prefix is required. The accumulated total is shown in a right hand column. It will NOT handle minus time, and will tell you so, and I have not trapped all the input errors possible, like an Oh for a Zero, so watch your fingers. It will require the proper deliminators when needed, and has an error message for that, without affecting the accumulated total.

<ENT ER> without an entry will start a new column of calculations (It is prompted at the beginning of the session) <E><ENTER> will end the program and remain in BASIC, <X><ENTER> will revert to the DOS. This is an "undocumented feature", it is not prompted, but most of my programs do that.

The program as it is, runs also under LS-DOS. It will not e<X>it to the DOS, unless you change the 'CMD"S"' at the end of line 16 to 'SYSTEM'. Easy. "CONV"ert it, change the line 16, and maybe utilize the 80 column screen by adding some spaces in lines 10, 12 and 24. But it doesn't look bad even with the Model III screen distribution.

I hope this little contribution will make a job easier some time or the other, and wish you a happy, healthy and prosperous 1995!
- Henry H. Herrdegen

RESUSCITATING FLAKY DISKETTES

RESCUING ERRATIC DIRECTORIES AND FILES

by Harold J. Hendriks

READING PROBLEMS?
"Seek error during read." "Sector not found." "GAT read error." "HIT read error." "Parity error during read." Etc. and Etc.

Error messages, such as the above, strike terror into the heart of any computer user trying to access important data stored on a disk, and, especially so, if there is no backup. The root causes for such error messages are legion. They include, but are not limited to, defective disk drives, defective diskettes, floppy disk controller problems, etc.

This article is not about disk reading problems due to computer malfunctions or damaged or defective diskettes. We are dealing here with another aspect of this all too common problem; one that usually can be remedied rather easily.

My trusty Model 4P Computer is more than ten years old. I have boxes and boxes full of old "Allwrite" data disks, "Profile Four Plus" data disks, "Multiplan" data disks, etc. that are eight, nine and ten years old. These old data diskettes have been stowed in diskette file boxes and tucked away on a shelf in a closet for many years.

Several months ago I needed to access some of the data stored on fifteen of my old data diskettes. I had saved duplicate, backup copies of each disk. Thus, there were thirty diskettes in all which contained the data I needed.

When I tried to access the directories of those old diskettes, my trusty 4P gave me GAT and/or HIT read errors on 22 of the 30 diskettes. About two-thirds of those flaky diskettes gave me intermittent GAT and/or HIT read errors while the others tended to give me rather persistent GAT and HIT read errors.

On the other hand, I could satisfactorily access the directories on eight of the old diskettes, however, I had other problems with them. When I tried to read or copy files from that group of diskettes, I got intermittent "Sector not found", "Seek on read errors" and/or other read errors of various types on most of them.

The new disk drives in my Model 4P are in excellent condition, and my Model 4P is in good working order. The old data diskettes were readable by my computer at the time I stowed them away

years ago. So what's the problem?

OLD DRIVES, OLD DISKETTES AND NEW DRIVES

Many of the TRS-80 Model 4 and 4P computers that were purchased ten or more years ago came equipped with single-sided, belt-driven disk drives. Some of those drives had a history of problems with reliability due to their antiquated design.

In general, most of us got along O.K. with those old disk drives because we had only two drives. We used drive 1 to format our data disks and we used drive 1 to write to our data disks and we used the same drive to read our data disks.

In the intervening ten years or so, most of the original Model 4/4P disk drives have gone the way of old disk drives. They have been replaced, for the most part, with new direct-drive, double-sided drives.

The alignment of the new drives is generally more precise and more stable than was the case for the old drives. In addition, due to the new direct-drive design, the disk rotation speed on the newer drives is more constant and precise.

Most of us Model 4/4P users are now using drives whose alignment may differ somewhat from the drives that were originally installed in our computers and used to format and to write to our old data diskettes. If the alignment differs too much from that of the old drive, this difference in alignment can be a major source of read errors.

Disk drives use a read-write head to "write" formatted tracks and to record data, both of which are in the form of binary patterns of very tiny magnetized bits on the surface of the disk. If the read-write head on the old drive produced a weak magnetic field, which was sometimes the case on those old drives, then the tiny data bits on the disk surface were weakly magnetized. To add to the problem, magnetized materials tend to lose magnetic strength with the passing of time.

Add it all up:

1. Differences in disk drive alignment.

2. Old heads producing weak magnetic fields.

3. Decay of magnetic data bits with time.

It really should not be too surprising that a new disk drive may have trouble reading an old data diskette that was formatted and written to many years ago by a disk drive of another and earlier vintage.

SUPER UTILITY 4/4P - A "WONDER WORKER"!

Super Utility 4/4P is to the Model 4 computers what Norton Utilities is to the MS-DOS computers. Super Utility 4/4P is an awesome, powerful, multifaceted, all-encompassing program. So much so, that many Model 4/4P/4D users find it to be so daunting and mind-boggling that they shy away from the use of it. This reaction is most unfortunate.

It's a pretty good bet that many Model 4 users and readers of "Computer News 80" own a copy of Super Utility 4/4P. It is also a pretty good bet that many of them found the first sight of the User's Manual to be a bit too formidable.

The common perception of Super Utility 4/4P is that the program is very complex and too difficult for the ordinary user to master. Consequently, many copies of this excellent and useful program are not used and are exiled to the closet shelf.

MEET THE "FORMAT WITHOUT ERASE" UTILITY

Computer users who are not fully conversant with diskette directory and file structures are well advised to avoid the use of the more powerful features of Super Utility 4/4P, particularly the "Zap Utilities" to alter and/or correct such structures.

However, there are certain utilities that are not difficult to understand or hard to use. One such utility is the "Format without Erase" utility that is included with the "Format Utilities".

The "Format without Erase" utility can work wonders with many flaky or marginal diskettes. Try it. You will be amazed how easy this utility is to use and what it will do. The "Format without Erase" utility alone is worth the price of Super Utility 4/4P.

CONFIGURATION, A BIG BUGABOO!

Throughout the remainder of this article I will use the shorthand designation, SU4, in place of the more formal name, Super Utility 4/4P.

Boot up the SU4 diskette, and the user is presented with the Main Menu. Select option 8 on the Main Menu and the "Configuration Table" is displayed. A typical SU4 Configuration Table is shown in Figure 1. Dealing with the "Configuration Table" spooks many first time users of SU4.

In order for the program to work correctly without

errors, SU4 must be correctly configured for the disk that is to be worked on using SU4. One feature of SU4 that makes the "Configuration Table" so daunting for many to deal with is the unusual versatility of the program, such as the large number of TRS-80 Disk Operating Systems and formats that SU4 can work with.

To correctly configure SU4, the user MUST know what Operating System was used to format the disk, the density of the disk, single or double, the number of sides, 1 or 2, the number of tracks (or cylinders) the disk was formatted with and the track (or cylinder) that the Directory is on.

Since the great majority of Model 4/4P/4D users use either TRSDOS 6.x or LS-DOS 6.x, I am limiting my discussion of SU4 in this article to using SU4 ONLY with diskettes formatted Double-density with either TRSDOS 6.x or LS-DOS 6.x.

If you use DOSPLUS, MULTIDOS or NEWDOS you are on your own.

SU4 uses the same DOS specifier, namely, T4D, for diskettes formatted Double-density with either TRSDOS 6.x or LS-DOS 6.x. The "T4" part of the DOS specifier stands for "TRSDOS for the Model 4". The "D" portion of the specifier stands for "Double-density".

The SU4 DOS specifier for Single-sided, Double-density, TRSDOS or LS-DOS 6.x formatted diskettes is T4D'. The single quote mark denotes Single-sided format. The DOS specifier for Double-sided, Double-density, TRSDOS or LS-DOS 6.x formatted diskettes is T4D". The double quote marks denote Double-sided format.

In addition, I am limiting this discussion of SU4 to use ONLY with diskettes that are formatted with 40 tracks or cylinders with the TRSDOS, LS-DOS 6.x default which places the directory on track 20.

If the reader is one who "Treads where angels fear to tread", and routinely formats diskettes with more than 40 tracks - you're on your own! REMINDER: 40 tracks means tracks 0 through 39. There is NO track 40!

CONFIGURING SU4, Part 1.
The SU4 Configuration Table displays five lines which contain the necessary configuration information. A typical SU4 Configuration Table is shown in Figure 1.

When SU4 initially displays the Configuration Table, a small arrow, " => ", points to the first data line in the Table. The first line in the Table provides for input which specifies how the user wants SU4 to handle the following features, Dual, Graphics, Locase, Linefeeds, Usr Key and Speed.

The first four items in line 1 pertain to your printer and its characteristics. We will not be needing or using the printer for the purposes of this article. I recommend that you use the entries suggested below for the first four items in line 1.

The "Usr Key" item refers to the assignment of Function Key F3. I strongly suggest that F3 be assigned to calling up the Configuration Table which is Item 8 on the Main Menu. Since the Model 4 can run satisfactorily at its normal CPU speed of 4 MHz, set Speed=Y.

If the first line in the Configuration Table appears as follows,

"Dual=N Graphics=N Locase=Y Linefeeds=N
Usr Key=8 Speed=Y",

accept the entries as displayed by pressing [ENTER]. The little pointer then moves to the second line in the Table. The first entry in line 2 should be, "+:0."

If the first line in the Configuration Table does not appear as shown above, then with the little arrow, " => ", pointing to line 1, type the following:

N,N,Y,N,8,Y [ENTER].

Note that each entry is separated by a comma and that there are no extra spaces between entries. Pressing the [ENTER] key moves the little arrow down one line to line 2.

CONFIGURING SU4, Part 2.
The little arrow should now be on line 2. The first item in the line should look like this:

+0: T4D' or +0: T4D"

The plus sign indicates that SU4 treats drive "0" as being operative and accessible. T4D' is the DOS specifier for a Single-sided, Double-density, TRSDOS or LS-DOS 6.x formatted diskette. T4D" is the same specifier for a Double-sided diskette.

Look at line 2 in the typical Configuration Table shown in Figure 1.

The entry, Ptks=40, indicates that the disk is formatted with 40 tracks, that is, tracks 0 through

39. Ignore the Relative tracks entry, Rtks. Rtks=Ptks for TRSDOS or LS-DOS 6.x formatted disks. SU4 automatically takes care of the Rtks entry.

The entry, Dir=20, indicates that SU4 expects to find the Directory on track or cylinder 20.

The entry, Stp=0, is a coded value for the track to track stepping rate. The code "0" indicates a stepping rate of 6 milliseconds which is normally O.K. If you experience too many read-error problems, change the coded value to 1 or 2 which corresponds to step rates of 12 and 20 milliseconds respectively.

The Rdly and Wdly are Read delay and Write delay timing values. Rdly=2 indicates that the read function is delayed 0.5 sec. from the time that the drive motor is turned on. Wdly=2 indicates a similar delay for the write function. If reliability problems are encountered, these two values can be changed to a value of 4 which will produce read and write delays of one second.

The entry, WP=N, indicates that the disk is NOT write protected by SU4.

If you are using SU4 to work on a Single-sided, Double-density diskette formatted with either TRSDOS or LS-DOS 6.x with the Directory on track 20, then line 2 in the Configuration Table should match the entries shown in line 2 in the typical Configuration Table shown in figure 1. If such is NOT the case, then proceed as directed in the next paragraph.

The little arrow indicator should be on line 2, the line for drive 0. To use SU4 with Single-sided, Double-density, diskettes formatted with 40 tracks with TRSDOS or LS-DOS 6.x, type the following on line 2:

+T4D',40,20,0,2,2,N [ENTER].

Note that you skipped entering a value for Rtks.

Note that the entries are separated by commas and that there are no blank spaces between entries.

Usually you can leave the last seven entries (40,40,20,0,2,2,N) in lines 2 and following the same. If you want to work with a Double-sided disk, you will need to change ONLY the first entry in the line. To do so, type:

+T4D" [ENTER].

The remainder of the line remains unchanged.

Each time you finish entering the configuration data for a drive and press [ENTER], the little arrow moves down to the next drive line. To tell SU4 that drives 2 and 3 are not active or in the system, place the arrow on the corresponding line and simply type a minus sign and then press [ENTER].

After entering the configuration information for drive 3 on line 5 of the table, SU4 asks you if you wish to save the Configuration. Answer with a "Y" if you wish to save the configuration. The SU4 disk must be in drive 0 in order for the configuration to be saved. After the Configuration Table is saved, the user is returned to the Main Menu.

REMOVE THE SU4 DISK FROM DRIVE 0 AND PUT IT IN A SAFE PLACE.

Once SU4 is loaded and configured, you do not need to have the disk in drive 0.

FORMAT WITHOUT ERASE - LET'S PRACTICE

A get-acquainted practice session is in order before you attempt to recover important data from a flaky diskette. You need something you can practice on without worrying about possibly making a mistake and losing important data.

Start by making a spare working backup copy of one of your Application Program Diskettes, such as your SCRIPSIT Pro disk or your TRSDOS or LS-DOS 6.x disk with Basic on it. You can "play" with this diskette using "Format Without Erase" without worrying about mucking it up. If you make a mistake, simply reformat and backup the diskette a second time and try again.

Now Configure SU4 in accordance with how you formatted your practice diskette. I am assuming that it is a TRSDOS or LS-DOS 6.x diskette formatted Double-density with 40 tracks or cylinders and that the directory is on track or cylinder 20. Be sure that the DOS specifier reflects the correct number of sides for the disk, T4D' for Single-sided, or T4D" for Double-sided.

After Configuring SU4 for your practice disk, remove the SU4 disk from drive 0 and insert your "Sacrificial Lamb" practice disk in drive 0.

Select item 3 on the SU4 Main Menu to bring up the "Format Utilities" Menu. Select Item 3 on the "Format Utilities" Menu to call up the "Format Without Erase" Utility. Answer the drive prompt with "0" for drive 0. Do not type the quote marks.

Now press [ENTER] and SU4 goes to work reformatting the disk without losing or erasing the data.

I am assuming that you used a good diskette to make your practice disk and that SU4 will have no problems reading any of the sectors. At the completion of the "Format Without Erase" operation, exit SU4 and try out the disk. If all has gone well, the "Sacrificial Lamb" disk will function properly as a program or system disk in your computer.

By playing with a spare backup disk you can develop experience and confidence in using the "Format Without Erase" Utility in SU4. After going through several practice sessions with the spare disk, you can proceed to work on one of your least valuable flaky disks with the "Format Without Erase" Utility.

MODUS OPERANDI OF FORMAT WITHOUT ERASE

SU4 reads one track of the disk at a time, starting with track 0, and stores the data for each sector in the track in a separate buffer in memory. As SU4 reads each sector, the CRC value for the data in the sector is computed and compared with the CRC value that is recorded at the end of the sector. If the CRC values check out, SU4 proceeds on to reading the next sector in the track.

NOTE: "CRC" stands for "Cyclic Redundancy Check." The CRC performs somewhat the same function for checking the validity of the data recorded on a disk sector as does the "Checksum" at the end of a line in a Basic Program.

After SU4 completes the reading of all of the sectors in the track into buffers in memory, SU4 then reformats the track, and then writes the sectors from memory back onto the freshly reformatted track. After SU4 has read, reformatted and written back the last track on the disk, it updates the directory.

If SU4 has trouble reading a sector and/or the CRC value for the sector does not check out O.K., SU4 pauses, presents the user with an error message and then presents the user with the options, R>etry, S>kip, C>ontinuous, N>onstop or Q>uit ?

When trying to recover data from a flaky disk, use R, C or N heavily. You can break out of either the C>ontinuous or N>onstop mode of operation by pressing the [CLEAR] key which will return you to the R>etry Menu. Don't give up on a bad sector too quickly.

It may take 20 or more tries before SU4 can successfully read a bad sector on a flaky disk. But the time and effort may be rewarded with success. If you tell SU4 to Skip a bad sector, any recoverable data in that sector will be lost when the track is reformatted.

It may be possible to simply Backup or Diskcopy a flaky disk. However, if a read error of any sort occurs, the Backup or Diskcopy process is aborted. The advantage of the "Format Without Erase" Utility in SU4 is that the process is not dependent upon the computer being able to successfully read the directory or flaky tracks or sectors in one pass. SU4 can read tracks into memory without having to access the directory.

BE PATIENT!

Fully Loaded, Single-sided, Double-density, 40 track, TRSDOS or LS-DOS 6.x diskettes:

If SU4 encounters only a few difficult to read sectors, and if SU4 is able to read each such sector in only a few tries, it will take SU4 between a minute and a half to perhaps two and a half to three minutes to do a complete "Format Without Erase" operation on the disk.

The more flaky sectors that SU4 encounters, and the more tries it takes to read each sector, the longer it will take SU4 to complete the "Format Without Erase" operation on the disk. But if the disk is flaky and the data is valuable, then even 20 to 30 minutes devoted to rescuing the data can be time well spent.

Fully loaded, Double-sided, Double-density, 40 track, TRSDOS or LS-DOS 6.x diskettes:

All other factors and conditions being equal, SU4 will take twice as long to do a "Format Without Erase" operation on a Double-sided disk as it does on a Single-sided disk. If the disk is good, SU4 takes only about 3 minutes to do the job. If SU4 encounters only a few difficult to read sectors which require only a few tries each to read, it may take 5 to 6 minutes to do the job. A really flaky diskette may take much, much longer.

CHECK THE DIRECTORY TRACK

If you are successful in the "Format Without Erase" operation on a flaky disk, the Directory may yet contains HIT or GAT errors. Do not remove the disk from drive 0 or exit SU4. Return to the Main Menu by pressing the [F1] function key.

At the Main Menu select Option 5, "Repair Utilities". The "Repair Utilities" Menu appears.

Select Option 9, "Check Directory". At the prompt for the drive number enter "0" (without the quotes) and press [ENTER]. SU4 will scan the Directory track and present you with information about the disk. If SU4 encounters GAT or HIT errors they will be reported to you. Press [BREAK] to return to the "Repair Utilities" Menu.

If the "Check Directory" operation detected GAT errors, select Option 1, "Repair GAT Sector". At the prompt for the drive number enter "0" (without the quotes) and press [ENTER]. Next SU4 will ask if you want the GAT Table only to be repaired or if you want to repair the entire GAT sector. Select GAT Table only. SU4 will read the information for each file in the Directory and rebuild the GAT table. Press [BREAK] to return to the "Repair Utilities" Menu.

If the "Check Directory" operation detected HIT errors, select Option 2, "Repair HIT Sector". At the prompt for the drive number enter "0" (without the quotes) and press [ENTER]. SU4 will proceed to repair the HIT Table.

PRESTO! FROM FLAKY TO GOOD!

IF the SU4 "Format Without Erase" Utility is eventually able to successfully read all the sectors in all the tracks on your flaky disk, and then reformats the tracks and writes back the data and verifies it all, and if SU4 is successful in correcting any GAT or HIT errors, you have a very good chance of having a disk that your computer can reliably read or copy or backup without any problems. It is best to backup the old, previously flaky disk onto a new disk and then discard the old disk.

A GOOD SCORE

Except for damaged diskettes or erased diskettes, I have recovered 100 percent of the data on every flaky diskette that I have attempted to resuscitate using the "Format Without Erase" and the "Directory Repair" Utilities of SU4. I have successfully resuscitated over 50 old, old, very flaky diskettes and then successfully backed them up to new diskettes. My archived disks and files are in excellent condition thanks to SU4.

VERSIONS OF SUPER UTILITY 4/4P

Super Utility 4/4P has evolved from the first incarnation of Super Utility which early day Model I users relied upon to salvage files from erratic and cranky Model I diskettes.

Super Utility Plus was a version for use primarily with either the Model III or the Model I. Since a good portion of the limited addressable memory of the Model I and Model III computers was in ROM, there was little addressable RAM memory for Super Utility to work with.

The Model 4/4P/4D computers were the first in the TRS-80 Model I, III and 4 line of computers to employ an all RAM memory. Super Utility 4/4P was designed to take full advantage of the full 64 K of addressable RAM memory of the Model 4/4P/4D computers. Although Super Utility 4/4P came out before the advent of the Model 4D, Super Utility 4/4P is fully compatible with Double-sided diskettes and runs as well on the Model 4D as on the Model 4 or 4P.

The standard version Super Utility 4/4P diskette itself does not employ either a TRSDOS 6.x or a LS-DOS 6.x format. The computer MUST be reset or rebooted with the SU4 diskette in drive 0. During the boot-up routine, no TRSDOS or LS-DOS logo appears and there are no prompts to enter the date or time.

At the conclusion of the boot-up routine, the Super Utility 4/4P logo appears on the screen. Pressing any key brings up the Main Menu for Super Utility 4/4P. At this point, the Super Utility 4/4P disk can be removed from drive 0. It is not needed for the operation of the program.

The standard version Super Utility 4/4P diskette uses a non-standard disk format. I know of no way to access the directory, if there is one, in the ordinary sense. The disk cannot be copied or backed up with any of the Backup or Diskcopy programs used by either TRSDOS 6.x or LS-DOS 6.x.

Super Utility 4/4P will not copy itself to another diskette. David Goben's Onepass Utility will not copy the standard version Super Utility 4/4P diskette. Copycat 4.1 for the Model 4 will copy the standard version Super Utility 4/4P diskette.

PowerSOFT, the producers of Super Utility 4/4P, produced an SU4/CMD file version of Super Utility 4/4P. The SU4/CMD file is provided on a TRSDOS 6.2 diskette. The TRSDOS 6.2 diskette with the SU4/CMD file can be backed up using the TRSDOS Backup Command. The SU4/CMD file can be copied to an LS-DOS 6.3 diskette.

Use the TRSDOS 6.x or the LS-DOS 6.x diskette with the SU4/CMD file on it to boot-up or reset the Model 4/4P/4D computer. The standard TRSDOS or LS-DOS logo appears with the standard prompts for date and time.

At the TRSDOS or LS-DOS ready prompt, type "SU4" and press [ENTER]. Do not type the quote

marks. The Super Utility Logo does not appear as the program loads. The first thing that appears is the Main Menu for SU4. When the SU4 Main Menu appears, remove the DOS diskette with the SU4/CMD file on it from drive 0. It is no longer needed.

The SU4/CMD File version of Super Utility 4/4P has a default version of the Configuration Table which can be edited to conform to the desired diskette format, BUT the edited version is good only for the current session of working with SU4. The edited Configuration Table CANNOT be saved, as it can be with the standard version of Super Utility 4/4P. This is only a very minor inconvenience as long as you use SU4 ONLY with TRSDOS 6.x or LS-DOS 6.x formatted disks.

The principal advantage of using the SU4/CMD file version on a standard TRSDOS 6.x or LS-DOS 6.x diskette is that the SU4/CMD file can be copied or backed up using standard TRSDOS or LS-DOS procedures.

THE BAD NEWS
The standard Super Utility 4/4P program and the SU4/CMD file on an LS-DOS or TRSDOS 6.x diskette are both excellent, useful and valuable programs. Any Model 4/4P/4D user who encounters a flaky, erratic, or cranky diskette will find either program to be a "life saver".

Unfortunately, neither program is available NEW from any known source today. If you want a copy of the standard Super Utility 4/4P program or of the SU4/CMD file on a DOS disk, you will have to find a used copy. Be sure that the User's Manual comes with the used copy of the program. DO NOT attempt to use Super Utility 4/4P or the SU4/CMD file without a User's Manual.

If you are interested in obtaining a copy of this program, I suggest that you place a Classified Ad in "Computer News 80" and in "Computer News PC". Since many "Computer News PC" subscribers are former users of TRS-80 Model 4 computers, some of them may be willing to part with their copies of the program. Good Luck and Happy, Error-free Computing.
-Harold J. Hendriks

(Editor's Note) SuperUtility is no longer available except on the used Market. If you have a copy in your library you are in luck, or if you find a copy on the used market don't pass it up, it is a very valuable program with many uses.

HRSLIDE/CMD

Part 2
by Gary W. Shanafelt

In the last issue, I reviewed several slide show programs for the Model 4 with a hi-res board. These are programs that allow you to display a number of high resolution images on your screen, one after the other. They all require you to create a list of files in advance, but the more elaborate also allow you to incorporate in the file list special scripting commands to manipulate those files, by varying the time they are displayed, allowing user input, merging one file over another, etc. With a little creativity, you can put together some pretty interesting presentations -- all on the lowly TRS-80.

I wanted a slide show program that allowed a maximum of user interaction during the actual presentation of the hi-res images. With the programs I reviewed, everything has to be planned in advance and put into your script file; once you run the actual program, you can't interrupt things to make changes. So, with Matthew Kent Reed's help, I ended up writing a new program, HRSLIDE/CMD. It is available with a demonstration slide sequence on disk MD4HRZ24 of The File Cabinet.

HRSLIDE displays a series of up to seven hi-res images in a continuous loop, advancing from one to the next automatically at a set speed or immediately when you hit a key. It won't handle more than seven pictures, but unlike the other hi-res displayers, it gives you complete control over your picture display while it's actually running. And since the pictures are held in memory rather than on disk during the display, it requires no additional disk accesses once the images have been loaded.

When you run HRSLIDE, you get a menu of command choices, accessible any time during your slide show. You can load in whatever combination of hi-res pictures you want, one at a time, advancing to the next slide after each load. You hit either <ENTER> or <SPACE> to switch to the hi-res screen and view the pictures. You can set the pause time between slides for a fast or slow display -- or you can disable automatic progression of pictures entirely, which means the same image will remain on the screen indefinitely until you hit a key. If you want to change the sequence of images, you can load in a new file wherever you want it. You can also mirror, negate, clear, or flip an image upside down with a single keystroke. The commands in the menu can all be accessed from the hi-res screen as well as from the menu itself. Naturally, when you're loading slides, you can display the directory and keep it on the screen while you're making your

selections. In short, you don't have to figure out all the commands you want in advance and put them in a special script file. Your options are immediately available when running the program itself, whenever you want to use them.

The program accepts standard HR, CHR, and SHR format files. When you load a file, you just type the file name, and Matthew Reed's load routines do the rest. If you've used MDRAW II version 5, you'll know how fast and bug-free Matthew's code is; it will load hi-res files that other loaders crash on. The same routines have been incorporated into HRSLIDE. The program doesn't currently support the new UHR format, though this is less of a drawback than might first appear. As Richard Snow explains in the documentation for his Magic Lantern program, UHR's main compression savings over the other formats comes with files with a minimal amount of gray areas, but it's precisely those images with a lot of gray areas -- converted from GIF and MACPAINT originals -- that I find the most interesting to display.

HRSLIDE also handles batch files. That is, while I tried to make it as easy as possible to load in pictures one at a time (particularly for people like me who are constantly switching disks in floppy drives), you can load a whole sequence from a pre-saved file list. You simply type the list of files you want to load, in the sequence you want them displayed, and save it back to disk in ASCII format with your favorite word processor. A sample demonstration sequence is included with the program. A typical batch file might look like this:

file1/hr
file2/chr
file3/shr
file4/hr
file5/hr
file6/chr
file7/shr

Of course, you can put together any sort of selection you want, depending on how many hi-res images you have: a sequence of Civil War pictures, a sequence of Renaissance paintings, a sequence of wildlife, a sequence of seascapes... or a mix of everything. If you don't have a lot of pictures to work with, the cheapest source (a LOT cheaper than downloading GIF files from CompuServe!) is the hi-res picture collection in The File Cabinet.

And now we get to the big question: Why seven pictures? The answer is that this is the max that I could fit into the memory of a 128K machine (or three pictures with 64K). A slide show program that loads pictures over and over again from disk can display as many pictures as are on the disk, but you gradually wear out your disk drives. What HRSLIDE does is to hold up to seven images in memory at the same time, and then to toggle from one to the next in a continuous loop. The only disk access is when you load the hi-res files to begin with. To give more variety to the display, the contents of each section of memory are loaded onto the screen in a different way. One image slides down from the top; the next moves in from the left; a few appear from two directions at once; etc.

The main challenge in writing the program was finding enough memory to hold a total of seven images and to make accessing it all automatic. One image is on the hi-res screen, two more are in normal memory -- for a total of three images on a 64K system. If you have 128K, three more images are in the alternate memory banks. The seventh image is split between regular memory, bank one of the alternate memory, and the non-viewable memory on the video board between Y coordinates 240-253 and X coordinates 0-79. This leaves just enough memory free for the program itself as well as about a thousand bytes for high memory drivers. HRSLIDE will automatically determine how much memory is free and where each image goes. All you have to do is load in the pictures; you don't have to assign each picture to a specific portion of memory.

It seems to me there are two answers to the perennial question, What can I do with a hi-res board? The practical answer is that you can use the images as clip art on newsletters and reading lists, as I do where I teach. But hi-res is also fun, especially when you show off a hi-res-equipped Model 4 to someone who remembers TRS-80's only for their low-resolution block graphics. Good graphics are a joy to look at, pure and simple. You can get great GIF files with Frank Slinkman's GIF4MOD4 utility; you can edit and enhance the images with MDRAW II or David Goben's MagicDraw; you can retrieve and print single files with Richard Snow's Magic Lantern; and if you just want to look at the pictures over and over again you can create yourself a slide show.

For an elaborate slide show with a lot of images and pre-arranged effects, Mike Harrow's DEMO/CMD or David Miller's HRPS/CMD, which I reviewed last month, are made to order for you. But if you just want to put some pictures together with a minimum of hassle and tinker with them as you go, a new option is now available: HRSLIDE/CMD.

-Gary W. Shanafelt

COLPRNT/BAS

by Roger L. Favorite

In your call for programs to share, here is another one that is mostly a collection of parts of various programs that I quite often use. (See program listing number two.) The purpose of this program is to print either on screen or hard-copy a list of data, in columns, with data sequence either left to right or top to bottom (your choice). This column printing is useful for short data items such as name to telephone number; name to account number; account number to name; name to handicap (golf list); name to amount (church giving); etc, where a long single column is wasteful.

Generally the printing process is incorporated into a BASIC program by use of the merge statement and modified (hard-coded) as needed; this eliminates most of the interactive housekeeping in this program. I only added the screen output to this program for my own entertainment. Normally all references and actions regarding 'output' would be eliminated so what's really needed to incorporate hard copy column printing into a production program is quite small.

Also any of the other 'pieces' of this program can be copied (merged) into a program as desired.

The routines I find useful for most programs are the:

1. Error messages (program detected)
   Lines 9100-9170

2. Errors (system detected) Lines 9300-9330

3. Checking for printer status Lines 9200-9230

I always put initializing (housekeeping) in higher line numbers.Somewhere I heard that BASIC always searches for a line number and begins at the beginning of the program, so the more often used lines should be near the front. I don't know if this is true but guess it dosen't hurt anything. I'm also sure that I can't tell the difference in process speed, esp. in small programs. In a large program that's hurting for space I usually will have a CHAIN MERGE DELETE statement that removes all housekeeping lines.

This program uses test data that is generated by lines 40000-40040. If the program can't find the test file then just <RUN 40000>, then <RUN>to restart. The test file creates 80 unique names, in 'alphabetic' sequence with a random telephone number. A delimiter (chr$ 126) is placed between the data items. This technique allows different length data items to be strung together in one record and then let the machine separate them when they are used.

I usually add line 60000 to programs so a simple GOTO will save the program with the same name every time without typing it.

I always bootup my system with JCL which includes loading a sort/cmd into upper memory (64551). Line 9590-9600 sets up the function to use the sort. Line 9650 switches the data items so the telephone number is first in the record, line 9660 then calls the sort to put the records in telephone sequence, and line 9670 switches the data again so the name is first in the record which is the way this program expects them. This is useful at times to build a cross-reference list of the items. All of these lines are now remarks as they aren't needed to demonstrate the column printing process but here to show how easy it can be to resequence data.

When sending the output to the printer I have used the controls for my EPSON FX-80. These controls are set in lines 9740-9810. Again these controls would be hard-coded in a production program.

The output to the screen allows previous page scrolling with the up-arrow key, except for the last page. The wait routine at line 8300 is only for between pages on the screen.
-Roger L. Favorite

A TALE OF 3 COMPUTERS

PART 2 The Model 4

by Jack E. Willson

The model 1 was used very successfully for a number of years. It became apparent that it was slow and the 48K Ram was insufficient for many business applications. In addition to the electronics business I was now also involved in selling commercial real estate. There were now additional mailing lists not only of electronics customers but of buyers and sellers of real estate. I was attempting to use the Model 1 to produce a monthly brochure of commercial business listings to be mailed to all of the prospective customers.

About this time the Model 3 became available. I resisted buying another expensive computer essentially because it would do little more that

the Model 1. Although it might be more convenient to use it was not really loaded with additional features that were not available on the Model 1.

Finally the Model 4 arrived on the scene. I again put off buying one until the gate array computer with a green screen was announced. Only then did I consider it as a good replacement. Finally in 1985 I put down my $1,303.00 and obtained a brand new Model 4. The only problem was that a few weeks later Tandy was ready to announce the Model 4D and dropped the price to about one half of what I paid. I was extremely unhappy with Radio Shack but there was nothing I could do about it.

Now I had a computer with 64K Ram and 4 disk drives. I was also able to add an additional 64K Ram for a total of 128K. Many of the Model 1 programs could be converted to the new DOS and several new more sophisticated programs were purchased to fill out needed vacant spots. These included Pronto, File, Report and Le Script. With the addition of HiRes and 512K Ram Anitek Super Drive boards we were now able to run any program available for the Model 4.

The Okidata 83 printer was not adequate for word processing and the DynaxDX-12 was to slow. I no longer needed a wide carriage printer however I did need a good, reasonably fast dot matrix printer with good NLQ reproduction in addition to several fonts. I also wanted to have a printer with the Epson protocol. I found this in the Epson FX-286 and added it to the system.

In the 1990's printers became more sophisticated and the prices dropped substantially. Two of the best new features were the 24 pin head and a large selection of fonts. I selected an Epson AP 5000+ and brought the system to a then state of the art.

The Model 4 was used successfully for several years. Service was available from the factory service centers and some of the stores and the Model 4 churned merrily along. With the advent of the PC compatibles less emphasis was being put on the Model 4 series by Tandy and eventually programs were discontinued and the stores didn't want to talk about these obsolete Model4's. Their main interest was in selling new PC's. Several magazines devoted to the TRS-80 stopped publishing leaving a void for the TRS-80owners.

We had hundreds of data disks collected over the years. These included both personal and business records such as mailing lists, income tax records, financial records, medical records and much more. It would be almost impossible to transfer all of this information over to another computer system. To protect my investment a nearly new Model 4D was purchased in 1989. Now with a little luck I could at least keep one of the Model 4's going all of the time.

My next purchase was a pair of outboard disk drives to replace the original Percoms. I selected one each of the 5.25" double sided and the 3.5"drives. It was my intent to use the 3.5" drive in place of a hard drive.The most used programs together with utility programs were put on this drive. The complete LSDOS was placed on drive 0. The computer would boot and then pick up the desired program from drive 2. I had considered purchasing a hard drive but the extra two drives appeared to be more cost effective and adequate for my current use. This left 2 double sided 5.25" drives for data.

It was about this time that I discovered Computer News 80. I saw an ad and wrote requesting a copy of the publication. This was the only magazine that I could find that was interested in helping those people with the orphaned TRS-80 computers. Here was a source of not only many new programs but also new hardware and classified ads to help move new or unneeded equipment and software.

I later found another Computer News 80 facility, their repair and upgrade service. I have had the opportunity to send both the Model 4 and 4D units to them for service. Services included a new disk controller, replacement Hi Res Board, and two replacement disk drives. In the several times that I have used the service I find it to have a fast turn around time and the repairs to be done properly and inexpensively.

Over the years the faithful old Model 4's have done a good job. Where can you find such an inexpensive computer that will do so much. I expect to be able to use them for many years. Possibly my lifetime. At 76 years of age this may be shorter than I think.
-Jack E. Willson

A TALE OF 3 COMPUTERS

Part 3. The Model 4 Emulator on a PC

by Jack E. Willson

I will start off by admitting that the only thing I knew about an IBM PC is that a "." and sometimes a "\" is used instead of a "/" in program names.

I had no intention of ever purchasing a PC and starting all over with a new system. If the new Model 4 Emulator program had not been produced there would be no third part to this article.

I noted the availability of the Model 4 Emulator program when it was first announced. Several persons reviewed it and were moderately excited with it however they had a number of suggestions for improvements. This sounded like something I should have but I decided to wait and see how it matured. I have spent a lot of money purchasing programs that never worked out the way the literature said they would.

I have been happy with my Model 4 and 4D however there was always the thought of what I would do for a computer if these broke down and there was no future source of parts and service. My only alternative would be to go to a PC using the Model 4 Emulator.

Then the new version was announced with all of the bells and whistles included. If this worked it would be the answer to my prayers. A computer that should never become obsolete and a Model 4 Emulator to run all of the programs and data that I had collected over 16 years. I did not own a PC however I decided to buy the program, try to run it on a PC and see what happened.

If I was to buy a PC there was a lot of work involved in determining just what to buy. I read the literature before I bought my first computer and I was able to come up with a successful purchase. Now there were hundreds of computer suppliers and manufacturers all of whom seemed to be selling the same thing but under a different name.

I visited two computer stores and told them that I wanted to buy a simple computer with moderate computing speed (the reviews indicated I would need 33 MHz), 4 MB of memory (all of the ads started with this), hard drive (who could possibly use more than 100-150 MB), an SVGA .39 dot pitch monitor (for Hi Res programs) and two disk drives, one 3.5" and one 5.25" (these were for backing up the Model 4 programs and data).

Both stores let me know in no uncertain terms that I would not be happy without at least a 486SX or a Pentium with a speed of at least 66 MHz, 8 MB of memory, 350 MB hard drive, a double speed CD Rom, a monitor with .28 dot pitch and that I really didn't need two disk drives. One 3.5" drive would be sufficient because everything of importance was going to be on the hard drive. These packages also included several hundred dollars worth of software that I didn't need.

When a computer such as the above was priced out it would cost me at least $1,800.00. Of course this was cheap compared to the $2,470.00 that I had paid for the Model 1 CPU and Expansion Interface with two disk drives. All I really wanted was something to run the Model 4 programs. I was thinking about a price of $1,000.00 for the whole package to my specifications.

Finally I started to just visit any store that sold computers, discount stores, department stores, catalog houses etc. I started finding a number of packages that might be what I wanted. One in particular was an IBM package that was being discontinued.

This was the IBM PS/1 series. The particular unit had a clock speed of 33 MHz, with provision for an upgrade to 50 MHz, 4 MB of Ram, 170 MB hard drive, one 3.5" and one 5.25" disk drive, 3 AT slots and 3 bays, mouse, SVGA video and an SVGA .39 dot pitch monitor. It was also supplied with MS-DOS and Windows. Just to make certain that they would be able to clear them all out, the package also included an Epson printer. I tried to buy the computer less printer (I already have three) but they wouldn't take it out. The entire package came to $999.99. All of the units were in sealed cartons with a full IBM warranty.

After I said that I would take that package the salesman tried to sell me something better by telling me that I would be unhappy with only the 170 MB hard drive and that he really thought that I would be back to have it upgraded in a few weeks. Little did he know that I intended on being happy with this purchase.

I started to read all of the information that was supplied with the computer. The DOS and Windows manuals were pretty heavy reading for someone who was only familiar with a simple Model 4. I needed something that was easier to get through. I had been in book stores and was familiar with the large number of reference manuals covering the multitude of PC programs. Some of my friends who owned PC's had indicated that you don't have to buy programs, just get a copy from a friend and then

pick up a reference manual at the book store. This is probably one reason why PC programming is so expensive.

I looked for a simple manual to cover MS-DOS. Among these books was a series that said it was intended for "Dummies" and another for "The Complete Idiot". With all due respect for these two publishers, I do not consider myself a dummy or an idiot, and decided I would not give either the time of day. I don't ever remember seeing anyone who considered a TRS-80 customer in either of these categories. I did find a simple book that helped me considerably in getting started. Actually all of the Information I needed to get started with the Emulator was included in the manual.

I already had the Emulator program from Computer News 80. Now all I had to do was to r-e-a-d the instructions and get started installing the program into the PC. With the exception of section 12, I read the Manual through several times. Frankly, the first time, most of it meant very little to me. There were several things that referred to MS-DOS and I had not learned that yet. However by reading and following the instructions I installed the programs and ended up with 'C:>' on the screen. Then when I typed 'CD TRS80' the prompt 'C:\TRS80>' appeared. After that it was only necessary to type 'Model4' and behold, the Emulator logo appears and when break was keyed the familiar LS-DOS welcome logo appeared. After that everything started to fall into place.

I started filling up the virtual drives so that all the programs and data would be handy. Drive 0 would permanently contain LS-DOS and the most used programs, Le Script, File, Report, Bookkeeping and Mail Addressing programs. Other virtual disk drives drives were set up as data disks that would be used on drive 1. Drives 2 and 3 were reserved for drives A and B, the 3.5" and 5.25" PC drives for backup and special program disks

With a 33 MHz speed in the PC the programs seem to run faster that on the Model 4. The Logo seem to appear magically in no time and the programs all quickly load with no problem. I have yet to find any of my programs that fail to load and operate normally.

I have yet to figure out which keyboard style to use. The PC is easiest because the keys caps are correct. There is a problem with File, Report and LeScript with their various key combinations to achieve program actions. Some I have not been able to duplicate on the PC keyboard. One of these is to exit Le Script. The combination of Shift-Control-0 doesn't work.

I guess it will take some time to work out all of the bugs, however the most important thing is that I now have a computer that will do everything I want it to and without the problem of obsolescence. In addition I can continue to add Model 4 programs as they become available. I always have the IBM programs if I find something that is not available for the Model 4. Now all that I need is to find out how to bypass the loading of Windows and come up with just the MS-DOS prompt when starting up.

Over the past 16 years a computer has been a big part of my life. It has been the only office machine that I could have used for many jobs. In one instance just to keep medical records of an ill family member would have been impossible without such a record keeping device. To write this article would be impracticable if I had to do it with just a typewriter. The retyping itself would take hours. Now I can make the corrections or additions and print it out as many times as I wish, and I have a spelling checker to find my errors.

Thanks to Computer News 80 and Jeff Vavasour all of us will be able to continue using our TRS-80's or at least the programming on a PC for many years to come.
-Jack E. Willson

OPEN FORUM

LTR: On page 107 of the excellent loose-leaf manual of Scripsit-Pro in the paragraph entitled "Pitch" there is this sentence: "Proportional printing packs more copy on the page but makes it a little more difficult to "stack" things under each other on the page..." I is a matter of opinion and of experience whether it is a "little" more difficult or a lot..

Another way to put the problem is that in the case of proportional headings and Scripsit Pro is WYSIWG. [what you see is what you get] The computer screen is often quite different from the printout. The enclosed sample page look far different on the screen than they do on the printed page. In order to get the column headings right I had to print and change the headings five times until I them right. It is a matter of using the space bar to move headings around, flying by the seat of the pants. It is too bad I can't send you a photo of my computer screen. And every time you move a word on the left you move the entire line!

All the above is not true if you use 10 or 12 pitch,

which I never do,. Actually I was quite surprised at how little trouble I had, but be forewarned if you are a new user of that excellent program Scripsit-Pro.
-B. E. D. Philadelphia, PA

A: First, any printing guide book will always tell you that when using proportional print fonts to use tab stops - not spaces to separate columns and that you cannot get columns to line up vertically without using "tab stops" and the only character that does line up vertically in column printing is the first letter. Because each letter does have a different width in proportional. Using 10 or 12 pitch "mono space" or one letter to a space that is equal to every other letter will line up each letter vertically. But even using 10 or 12 pitch proportional fonts, the letters do not line up one over the other.

If you want one line of words such as a header to be centered over the numbers or words in a column you would have to use different tab stops for the heading line. For example:

FIRST NAME	LAST NAME
Mary	Smith
Peter	Jones
etc.	etc.

The first line has different tab settings than the lines following it. If you practice using Control T and setting the tabs you will see that you have much less work to do to format your document. The use of period alignment makes the stacking of numbers like dollars and cents line up perfectly.

When you use tab stops you can change the word in the first column, without the whole line shifting, or you can change the word in any column with out any of the other columns changing.

The term WYSIWG is used for any program where the text layout (document format) is shown on the screen as it would be printed on paper, instead of continual word wrap lines shown on the screen where you need to insert printer codes and then print the document on paper before you see how it is layed out. You also must remember that the letters on the screen are mono spaced, and no word processor, prior to Word for Windows will show the true appearance of your document on the screen before you print it. And for that you are looking at a computer with a word processing program installed with a combined cost of $2000 or more. Especially if you want to have mixed font styles and graphics show on your screen the way they would look on paper when printed.

LTR: Last I wrote concerned Mr Henry H. Herrdegen's renumber program. I am afraid that, at the time, I did not understand why he wanted renumbering performed the way the program did the renumbering. I enclosed a program that would remove spaces from BASIC programs between the line numbers and GOTO and GOSUB.

In April he sent me a nice letter explaining why he wanted the renumber program to work as it does. I immediately set off in six different directions to fulfill the requirements he set out in his letter. As a result I have not accomplished much.

I also failed to answer your question concerning the operating system I use when running Model III programs. When I run Model III programs I use TRSDOS 1.3. What brought me up short from my scurrying about was a request from my daughters for a program the would print a matrix of answers. This is intended to stimulate her students to find answers to questions in a manner similar to BINGO. Each student's sheet was to be different from every other student's sheet. I have enclosed a copy of the BASIC program that produces such a matrix. I also have enclosed a Model 4 disk with this letter and the BASIC program saved in ASCII.

This letter is saved as CN80494/TXT and the program as BINGO/BAS.

With regard to Mr Herrdegen's renumber program, I am still working on an assembler program to meet his specification. He also suggested that the program I wrote to delete spaces might be changed to delete only the spaces following GOTO and GOSUB. This will be easier, but it does not fulfill the requirement to limit the extent of the line numbers to be renumbered.
Merlin P. Walters, Fairfax, VA

(See Program Listing Number Three)

REMINDER

If the last four digits on your mailing label are 95/02, then this is your last issue. Time to get your renewal in the mail.

MOVING?

Remember to send us your new address.

ADSUBTME/BAS PROGRAM LISTING NUMBER ONE by Henry H. Herrdegen

```
1 'ADSUBTME/BAS: to add and subtract Hr's, Min's & Sec's, as "(-)H:MM.SS".  by Henry H. Herrdegen,
(94 12 24)
10 CLS: PRINT "Enter times, accumulation shown at right, <ENTER> for new list. "
12 LINE INPUT "  Enter (-)H:MM.SS:  "; A$
14 H=0: M=0: S=0: T=0: F=0: IF A$="" THEN TT=0: GOTO 10
16 IF A$="E" THEN CLS: END ELSE IF A$="X" THEN CLS: CMD"S"
18 IF LEFT$(A$,1)="-" THEN A$=RIGHT$(A$,LEN(A$)-1): F=1
20 I=INSTR(A$,":"): J=INSTR(A$,".")-I
22 IF I THEN IF J<>3 THEN 46
24 IF J AND LEN(A$)-I<>5 THEN 46
26 IF I=0 AND J=0 AND LEN(A$)>2 THEN 46
28 IF I THEN H=VAL(LEFT$(A$,I-1))
30 IF J THEN M=VAL(MID$(A$,I+1,2)): IF M>59 THEN 46
32 S=VAL(RIGHT$(A$,2)): IF S>59 THEN 46
34 T=H*3600+M*60+S: IF F THEN TT=TT-T ELSE TT=TT+T
36 IF TT<0 THEN TT=TT+T: GOTO 48
38 HT=INT(TT/3600): MR=HT*3600: MT=INT((TT-MR)/60): SR=TT-MR: ST=SR-(MT*60)
40 S$=RIGHT$(STR$(ST),2): IF S$<"10" THEN S$="0"+RIGHT$(S$,1)
42 M$=RIGHT$(STR$(MT),2): IF M$<"10" THEN M$="0"+RIGHT$(M$,1)
44 PRINT TAB(35) CHR$(27) "Total now: " STR$(HT)+":"+M$+"."+S$: GOTO 12
46 PRINT " Enter proper digits and/or deliminators!": GOTO 12
48 PRINT " Minus hours not calculated! Last Total is valid. Continue!": GOTO 12
```

COLPRNT/BAS PROGRAM LISTING NUMBER TWO by Roger L. Favorite

```
1 '  *** COLPRNT/BAS ***
2 'Roger Favorite   1010 E. Traverse Lk Rd   Cedar, MI  49621
1000 '   ** Mainline Driver --
1010 GOSUB 9500        'Housekeeping
1020 GOSUB 3000        'Print Columnar List/Report
1030 CLS:PRINT@250,"RUN COMPLETE":  STOP
3000 '  *** Develop and Print Detail Lines
3010 IF OUTPUT=1 THEN PRINT CHR$(15);
3020 PAGES=FIX(CNTR/(LP*CP))
3030 FOR PAGE=0 TO PAGES:
    POINTER=PAGE*(LP*CP):
    GOSUB 8100:
    FOR LYNE=1 TO LP:
     FOR COLUM=0 TO CP-1
3040   IF T2B=1 THEN ICNTR=POINTER+(LYNE+(LP*COLUM))      ELSE
ICNTR=POINTER+((LYNE-1)*CP)+(COLUM+1)
3050   IF ICNTR>CNTR AND COLUM=0 THEN      PAGE=99: LYNE=99: COLUM=9:
GOTO 3110
3060   Q$=DATUM$(ICNTR)
3070   IF Q$="" THEN 3110
3080   IF OUTPUT=1 THEN
       PRINT TAB(COLUM*(LEN(COLHDR$)+2)+1) USING
F1$;LEFT$(Q$,INSTR(Q$,CHR$(126))-1);MID$(Q$,INSTR(Q$,CHR$(126))+1);:
       GOTO 3110
3090   PRINT@0,"Processing Record for:";:
       PRINT@80,Q$;
```

Cont'd on next page

```
3100   LPRINT TAB(COLUM*(LEN(COLHDR$)+2)+1) USING
F1$;LEFT$(Q$,INSTR(Q$,CHR$(126))-1);MID$(Q$,INSTR(Q$,CHR$(126))+1);
3110   NEXT COLUM
3120   IF OUTPUT=1 THEN 3130      ELSE LPRINT
3130  NEXT LYNE
3140 NEXT PAGE
3150 IF OUTPUT=1 THEN GOSUB 8300
   ELSE LPRINT CHR$(12):LPRINT SETOFF;E$;"2"
3160 RETURN
8000 '       *** SUBROUTINES
8100 '   ** Page Headings --
8110 IF PAGECNT>0 AND OUTPUT=1 THEN GOSUB 8300
8120 IF WATE$=CHR$(11) AND PAGE>1 THEN
POINTER=POINTER-((LP*CP)*2):PAGE=PAGE-2:PAGECNT=PAGECNT-2    ELSE IF
WATE$=CHR$(11) AND PAGE=1 THEN POINTER=0:PAGE=0:WATE$="":GOTO 8150
8130 PAGECNT=PAGECNT+1
8140 IF PAGES=PAGE THEN LP=(CNTR-(LP*CP)*PAGES)/CP
8150 CLS:
   IF OUTPUT=1 THEN
   PRINT@(0,30-(LEN(G$))/2),G$;TAB(64)"PAGE: ";STR$(PAGECNT):
PRINT@(1,30-(LEN(G1$)/2)),G1$;TAB(64);"DATE: ";DATE$:
PRINT@(2,30-(LEN(G2$)/2)),G2$;TAB(64);"TIME: ";TIME$
8160 IF OUTPUT=1 THEN
    FOR J=1 TO CP:PRINT COLHDR$"  ";:NEXT J:PRINT:
    FOR J=1 TO CP:PRINT COLUNDRLINE$"  ";:NEXT J:     GOTO 8220
8170 IF PAGE>0 THEN LPRINT CHR$(12)E$"@";
8180 LPRINT SETPRNT;E$L68$;
8190 LPRINT G$ ;TAB(CP*(LEN(COLHDR$)+2)-10);"PAGE:"STR$(PAGECNT):
   LPRINT G1$;TAB(CP*(LEN(COLHDR$)+2)-10);DATE$:
   LPRINT G2$;TAB(CP*(LEN(COLHDR$)+2)-10);TIME$
8200 LPRINT:
   LPRINT"Name and Telephone No. (Test Data)":
   LPRINT
8210 FOR J=1 TO CP:LPRINT COLHDR$"  ";:NEXT J:LPRINT:
   FOR J=1 TO CP:LPRINT COLUNDRLINE$"  ";:NEXT J:LPRINT
8220 RETURN
8300 WATE$=INKEY$:
   IF WATE$="" THEN 8300
   ELSE RETURN
9100 '
     = = = MESSAGES = = =

9110 SOUND 1,0:MSG$="SET PRINTER TO TOP OF FORM":GOTO 9150
9120 SOUND 1,0:MSG$="PRINTER NOT READY":GOTO 9150
9130 SOUND 1,0:MSG$="INVALID VALUE- TRY AGAIN":GOTO 9150
9140 SOUND 1,0:MSG$="COLUMNS EXCEED PAGE WIDTH- TRY AGAIN":GOTO 9150
9150 FOR L1=1 TO 4:PRINT@(23,0),MSG$;:FOR L2=1 TO 370:NEXT L2
9160 PRINT@(23,0),STRING$(LEN(MSG$),"");
9170 FOR L2=1 TO 70:NEXT L2:NEXT L1:RETURN
9200 '
     = = = PRINTER STATUS ---

9210 IF (INP(248) AND 240)=48 THEN RETURN
9220 GOSUB 9120:PRINT MSG$" ---> <ENTER> when ready";
9230 GOSUB 8300:PRINT@(23,0),CHR$(31):GOTO 9210
```

Cont'd on next page

```
9300 '
     = = = ERROR HANDLING = = =

9310 IF ERR=57 THEN GOSUB 9210:RESUME
9320 PRINT@(22,0),"Error: "ERR" in line #: "ERL
9330 PRINT@(23,0),;:INPUT "  HIT <ENTER> TO PROCEED";Q: RESUME
9500 '
     *** Housekeeping ***

9510 CLS: PRINT@(3,10),"BEGIN HOUSEKEEPING"
9520 ON ERROR GOTO 9310
9530 G$="NAME / TITLE HERE":    G1$="ADDRESS HERE":    G2$="SYSTEM NAME HERE"
9540 COLHDR$=    "NAME          TELEPHONE"
9550 COLUNDRLINE$="---------------- --------"
9560 F1$=        "\           \ \     \"
9570 DEFINT A-P: DEFSTR S:  E$=CHR$(27)
9580 DIM DATUM$(500)
9590 'S4PTR!=64551!: DEF USR 0 = S4PTR!
9600 'DEF FN SORT4$(X%) = USR 0(MKI$(VARPTR(DATUM$(X%))-X%*3) + MKI$(X%))
9610 INFILE$="coltest/dat:1"
9620 OPEN "I",3,INFILE$
9630 WHILE NOT EOF(3):
     CNTR=CNTR+1:
     INPUT#3,DATUM$(CNTR):
     WEND:
     CLOSE 3
9640 CLS: PRINT@(1,10),"NO. OF ITEMS - "STR$(CNTR)
9650 'FOR I=1 TO CNTR:
DATUM$(I)=MID$(DATUM$(I),INSTR(DATUM$(I),CHR$(126))+1,8)+CHR$(126)+LEFT
$(DATUM$(I),INSTR( DATUM$ (I),CHR$(126))-1):
    NEXT I
9660 'DUMMY$=FNSORT4(CNTR)
9670 'FOR I=1 TO CNTR:
   DATUM$(I)=MID$(DATUM$(I),INSTR(DATUM$(I),CHR$(126))+1)+CHR$(126)+LEFT
$(DATUM$(I),INSTR( DATUM$(I) ,CHR$(126))-1):    NEXT I
9680 PRINT@(3,10),;:INPUT "HOW MANY LINES PER PAGE: ";LP
9690 PRINT@(4,10),;:INPUT "HOW MANY COLUMNS ON PAGE:",CP
9700 PRINT@(5,10),;:INPUT "Sequence TOP TO BOTTOM (1) or LEFT TO RIGHT (2):",T2B
9710 IF T2B<1 OR T2B>2 THEN GOSUB 9130:GOTO 9700
9720 PRINT@(6,10),;:INPUT "IS OUTPUT TO SCREEN <1> or HARDCOPY <2>:",OUTPUT:
   IF OUTPUT=1 THEN 9730
   ELSE IF OUTPUT=2 THEN 9740
      ELSE GOSUB 9130:GOTO 9720
9730 IF CP*(LEN(COLHDR$)+2)>80 THEN GOSUB 9140:GOTO 9680
   ELSE 9820
9740 GOSUB 9210
9750 PRINT@(7,10),;:INPUT "PRINT AT 6 OR 8 LINES/INCH:",L6OR8%
9760 IF L6OR8%=6 THEN L68$="2"
   ELSE IF L6OR8%=8 THEN L68$="0"
      ELSE GOSUB 9130:GOTO 9750
9770 PRINT@(8,10),;:INPUT "Print PICA (1) or Elite (2) or Condensed (3):",MODE
9780 IF MODE=1 THEN SETPRNT=E$+"@"
   ELSE IF MODE=2 THEN SETPRNT=E$+"@"+E$+"M":SETOFF=E$+"P"
      ELSE IF MODE=3 THEN SETPRNT=E$+"@"+E$+CHR$(15):SETOFF=E$+CHR$(18)
         ELSE GOSUB 9130:GOTO 9770
9790 IF MODE=1 AND CP*(LEN(COLHDR$)+2)>80 THEN GOSUB 9140:GOTO 9680
```

Cont'd on next page

```
9800 IF MODE=2 AND CP*(LEN(COLHDR$)+2)>96 THEN GOSUB 9140:GOTO 9680
9810 IF MODE=3 AND CP*(LEN(COLHDR$)+2)>132 THEN GOSUB 9140:GOTO 9680
9820 RETURN
40000 '   *** COLTEST/BAS ***
      SET UP TEST FILE
      NAME AND PHONE NO.
40010 OPEN "O",1,"COLTEST/DAT:1"
40020 FOR I=1 TO 80
40030  PRINT#1,"NAME #";RIGHT$(STR$(100+I),2);CHR$(126);RIGHT$(STR$(1000+R
ND(999)),3);"-";RIGHT$(STR$(10000+RND(9999)), 4)
40040 NEXT I: CLOSE: END
60000 SAVE "COLPRNT/BAS:4": END
```

BINGO/BAS PROGRAM LISTING NUMBER THREE by Merlin P. Walters

```
100 DEFSTR A: DEFINT B-Z: RANDOM
110 INPUT "Enter the quantity of matrix elements to be entered."; B
120 IF B<25 THEN PRINT "A 5 X 5 matrix requires at least 25 entries. Please try again.": GOTO 110
130 DIM A(B), AA(B)
140 INPUT "Enter the quantity of matrices to be printed."; C
150 FOR X = 1 TO B
160 PRINT "Enter matrix entry"; X;: LINE INPUT A(X)
170 PRINT "Is ";A(X);" correct? (Y/N) : ";: LINE INPUT AN
180 IF AN="N" OR AN="n" THEN PRINT: GOTO 160
190 IF AN<>"Y" AND AN<>"y" THEN PRINT: PRINT "Please answer Y or N ": GOTO 170
200 IF LEN(A(X))> 15 THEN PRINT "Please limit length of entry to 15 characters
   or less.": A(X)="": GOTO 160
210 NEXT X
220 PRINT "When the printer is ready, press any key."
230 AB = INKEY$: IF AB="" THEN GOTO 230
240 FOR Y = 1 TO C
250 FOR X = 1 TO B: AA(X) = A(X): NEXT X
260 FOR X = B TO 2 STEP-1
270 E = RND(X)
280 SWAP AA(X) , AA(E)
290 NEXT X
300 D = 1
310 FOR X = 1 TO 5
320 FOR Z = 0 TO 64 STEP 16
330 LPRINT TAB(Z) AA(D);: D = D + 1
340 NEXT Z: LPRINT: LPRINT
350 NEXT X
360 FOR F = 1 TO 56: LPRINT: NEXT F
370 NEXT Y
380 END
```

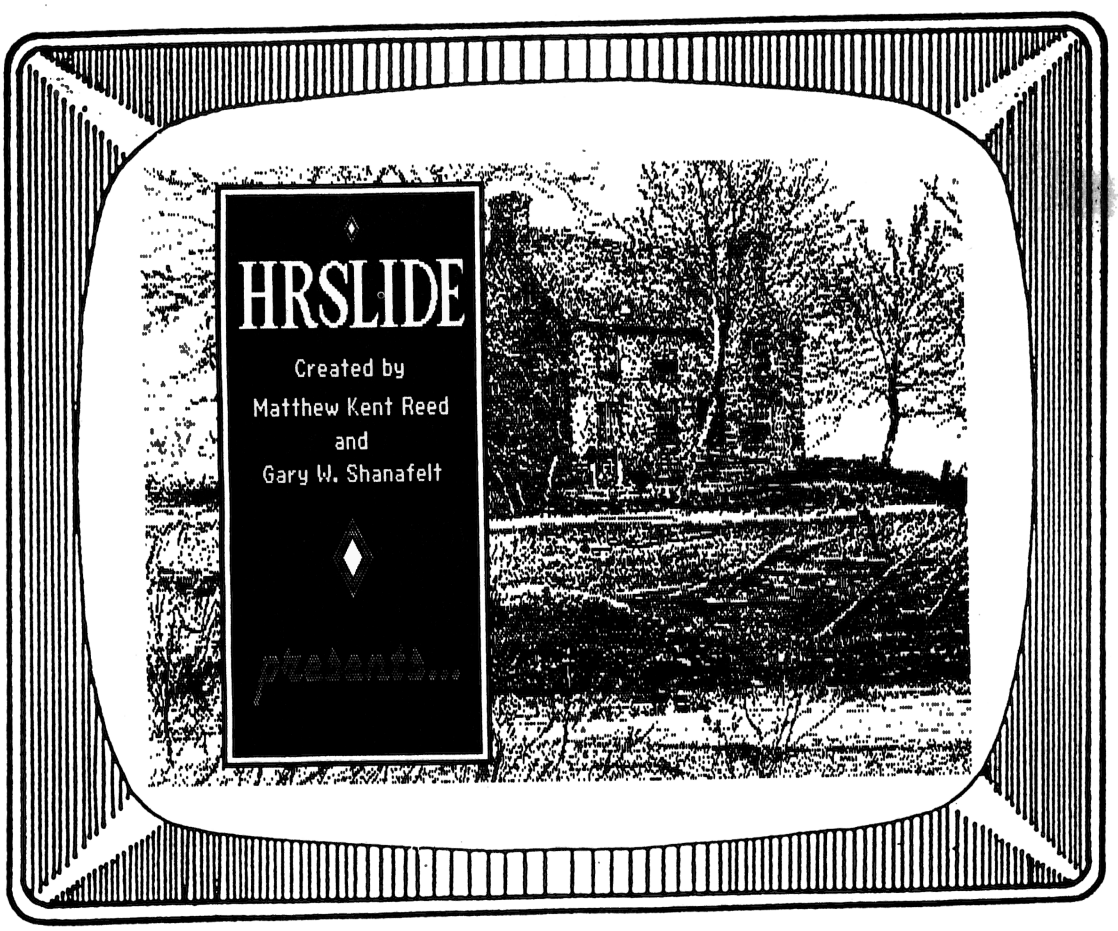
MENU OF COMMANDS and TITLE SCREEN
from the HRSLIDE/CMD PROGRAM
File Cabinet Disk # MD4HRZ25

```
HRSLIDE -- Multiple Hi-Res Image Displayer
By Gary W. Shanafelt and Matthew Kent Reed
Version 1.2 - Copyright © 1994
```

```
[I]  Invert screen
[M]  Mirror screen
[N]  Negate screen
[CLEAR-SHIFT]  Clear screen

[P]  Pause between screens (0-255,
     0 = no pause, 255 = automatic
     advance disabled).  Now: 30
[D]  Disk access

[SPACE] or [ENTER]  Advance screens
[BREAK]  Exit screen mode, exit program
```



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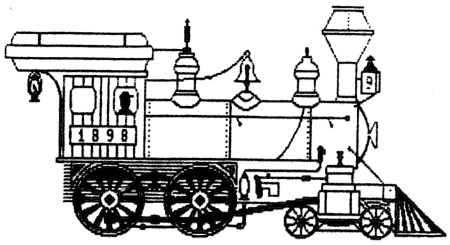

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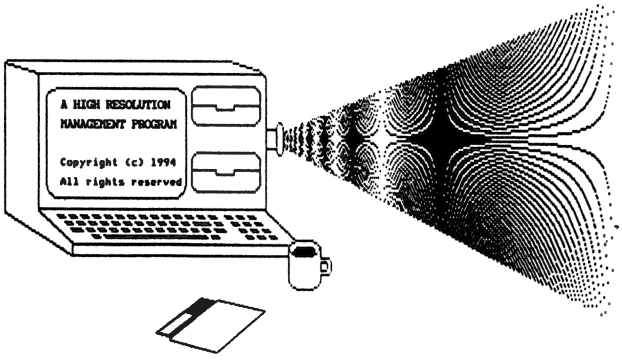

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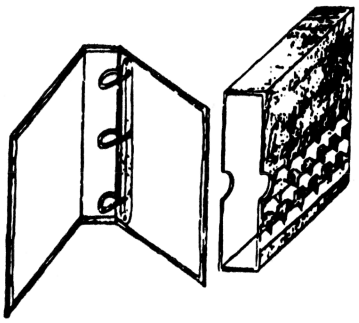

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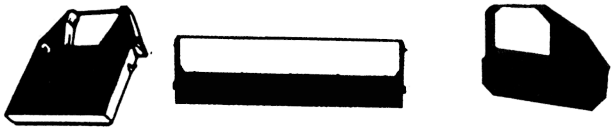

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By Jeff Vavasour

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Legal	10 point
Helvetica	10 point
Optimas	10 point
Palitine	10 point
Times Roman	10 point
Palitine	12 point
Centrum	12 point
Optimis	12 point
Helvetica	2 point
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MODEL 4 TRS-80 PUBLIC DOMAIN	$ 2.00 (X)
MODEL 4 HIGH RESOLUTION	$ 2.00 (X)
MODEL 4 MACPAINT HIGH RESOLUTION	$ 2.00 (X)
MODEL 1/3 PUBLIC DOMAIN CATALOG	$ 2.00 (X)
SYMPHONY 90 MUSIC CATALOG	$ 3.00 (X)

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TRSDOS 1.3 R/S Cat # 26-0312 — $ 7.00 (X)
Model 3, Disk Operating System and BASIC

TRSDOS 6.2.1 — $ 45.00 (Z)
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Use as Double or Single Sided Disks. 100% Error Free Lifetime Guarantee with Paper Sleeves, Labels & Tabs.These disks are manufactured in South Dakota by Syncom and are equal in quality to 3M brand disks, with a 3 mil heavy duty jacket.

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A-B SWITCH, PARALLEL $ 14.75 (Z)
With three female 36 conductor centronics connectors.

A-B SWITCH, SERIAL, RS232 $ 12.75 (Z)
With three DB25 Female connectors.

THREE POSITION SERIAL SWITCH $ 16.95 (Z)
w/4 DB25 Female connectors

FOUR POSITION SERIAL SWITCH $ 20.95 (Z)
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CABLES REQUIRED BETWEEN AB SWITCH and PRINTER

Printer to Selector Switch 6' $ 13.49 (Z)
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RS232 SERIAL CABLES

RS232 Serial Cable 6 ft. $ 8.95 (Z)
Equal to Radio Shack #26-240, Male - Female

RS232 Serial Cable 6 ft. $ 8.95 (Z)
Equal to Radio Shack #26-249, Male - Male

RS232 NULL MODEM Cable 6 ft $ 9.95 (Z)
Connect two computers together.

RS-232 EXTENDER CABLE $ 8.00 (Z)
For computers w/RS-232 connector pointing down on the bottom of the computer.

HARD DRIVE CABLES

HARD DRIVE CABLE 4 ft $ 16.00 (Z)
w/50 pin Edge Card connector & H D pin connector.

50 Pin Y CABLE $ 18.00 (Z)
Enables hard two units to be connected to the I/O-Bus at the same time.

RS232 ENTENDER CABLE

RS232 Extender $ 8.00 (Z)
FOR Non-gate array computers which have the RS232 cable pointing down out of the bottom of the computer.

PRINTER CABLES for TRS-80 & 1000 COMPUTERS

Flat Ribbon 6', Mod III/4/4D&P $ 12.95 (Z)

Flat Ribbon 12', Mod III/4/4D&P $ 15.00 (Z)

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MOUSE PAD $ 2.45 (Z)

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Mouse pad, holder and adapter are free when ordered with the three button mouse.

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Clock chip with ROMCLOCK4 or ROMCLOCK3 Utility program package and installation instructions. Keep time and date current. 10 year lithium battery.

I/O-BUS CLOCK EXTERNAL $ 59.00 (Z)
Realtime clock uses exterior I/O Bus, no internal connections or wiring.

EXTERNAL MODEL 4 OR 4P HARDWARE ADD-ONS

I/O-BUS LD INTERFACE $180.00 (Z)
Connect an exterior disk drive unit to your 4P or Model 4/4D, not required for the first two drives on your Model 4/4D.

POWER SUPPLIES FOR MODEL 4/4P/4D OR MODEL III

ASTEC 65 WATT POWER SUPPLY $ 62.00 (Z)
For units that have only one supply.

ASTEC 38 WATT POWER SUPPLY $ 22.95 (Z)
For units that have two small supplies.

MODEL 4 HARDWARE

Non-gate array Motherboards 64K memory	$ 49.95 (Z)
Non-gate array Motherboards 128K memory	$ 70.90 (Z)
Sound Board Kits	$ 10.00 (Y)

MODEL 4P HARDWARE

Cooling Fans 12 vdc used.	$ 6.00 (Z)
Internal 300 Baud Modems used.	$ 20.00 (Z)

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34 Conductor	$ .51 ft.(Z)
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DMP130/130A/132/133/107	26-1236	CN1006	FABRIC CART.	6.40	5.90
DMP130/130A/132/133/107	26-1238	CN1007	FABRIC REFILL	5.00	4.50
DMP 500	26-1482	CN1008	FABRIC CART.	13.40	12.90
DMP 500	26-1482	CN1043	FABRIC REFILL	5.30	4.80
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DMP 120, 200	26-1489	CN1010	FABRIC REFILL	4.85	4.35
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EPSON FX/MX/RX-80	900-2327	CN1033	FABRIC CART.	5.50	5.00
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SEIKOSHA SL-90		CN1046	FABRIC CART.	7.25	6.75
SEIKOSHA SL-270		CN1047	FABRIC CART.	15.40	13.86

ALL RIBBONS ARE BLACK, CART.= Plastic Cartridge, REFILL= Refills Only/No Cartridge.

Add for Shipping and Handling

1 to five items add (Y) ... 6 or more items add (Z)
Please refer to the CN80 Product Guide Shipping and Handling Schedule.

Some ribbons for the older Radio Shack printers are not stocked, but are still available by special order, please allow an additional week shipping time. All stock ribbons are shipped within 24 hours from the time the order is received. C.O.D. orders accepted. Government and educational institution purchase orders are accepted. Sorry, we do not accept credit card orders.

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ADDRESS CORRECTION REQUESTED