

THE Clone Newsletter

DEDICATED TO FRUSTRATED DISK USERS

What's happening to our CLONE MACHINE?

By now most, if not all of you, are probably aware that we have updated the old CLONE MACHINE package to include a fast and powerful nibble copier and a bumpy error detector. This new version is called SUPERCLONE and it can be had for \$10 (plus postage and handling) by all registered CLONE MACHINE owners as part of our continuing update policy. Response on the new product has been very positive. People are now able to backup in an easy one step process programs by such companies as DATA-MOST and ELECTRONIC ARTS, that that previously were difficult, if not altogether impossible, to do. However, not being ones to sit on our laurels, when we began to hear of new uncopyable programs soon after the release of SUPERCLONE, we immediately went to work on version 2.0. Released only weeks ago, this new version of SUPERCLONE has been beefed up with two very important additions: THE TOUGH-NUTS UTILITY (TNU), and THE FOUR MINUTE BACKUP (FMB). The TNU is a trio of programs that will enable you to backup the most state of the art protected disks. We believe it to be a very unique and powerful addition to our SUPERCLONE package, and you will find it fully described later in these pages. Our other new addition, THE FOUR MINUTE BACKUP is exactly what its name implies. Hard to believe? Well, it may be, after many months of waiting on that slow 1541 drive for backups. However, I can assure you that through some programming wizardry it does indeed exist. This program will copy an ENTIRE diskette on a single 1541 drive in just over four minutes. For more details, see elsewhere in this newsletter. If you are one of the early SUPERCLONE buyers, and did not receive version 2.0, we apologize. Just let us know and we'll fix you right up.



\$100 Reward for your efforts

That's right!! We will pay from \$10 to \$100 or we will provide free merchandise for articles, short stories, news, etc. dealing with subjects that are of interest to owners of the Clone Machine. Send to:

EDITOR: Clone Newsletter
c/o Micro-W PO BOX 198
Butler, N.J. 07405

We are sorry that all submissions can't be acknowledged or returned. If possible, include your phone number so that we can contact you if we are interested in using your article. Thanks for your support.

***** NEW PRODUCTS FROM MICRO-W *****

The past two months have been busy ones for our programming staff here at Micro-W. In addition to adding the new TOUGH-NUTS UTILITY onto the SUPERCLONE package, there have been a number of major improvements and additions on some of our other products. We are very pleased to report that now our diagnostic program MR.TESTER includes both a disk alignment and speed check in addition to its many other tests. It is now without a doubt one of the most comprehensive diagnostic programs that exists today for the COMMODORE 64. We will be offering MR.TESTER to our CLONE NEWSLETTER subscribers for the special price of only \$18 plus shipping and handling. Any owners of the original MR.TESTER program can upgrade to this new one. Just send back your old one and include funds to cover shipping and handling costs.

Our powerful database program FANTASTIC FILER, has now also been improved. It has been combined with its sister program FANTASTIC FORMS into one complete package and appropriately renamed FANTASTIC FILER PROFESSIONAL. Again, all owners of the original product can receive the upgrade as described above. FANTASTIC FILER PROFESSIONAL retails for \$29.95.

Finally, a truly NEW product has arrived. SCREENDUMPER 64 is out at last! We must apologize to all of our customers who had ordered it as soon as it was announced, which was some months ago. Thank you for being patient! SCREENDUMPER is being offered to all registered CLONERS for \$18 plus s&h.

THE NEW ADDITIONS: TNU & FMB

The latest version of the SUPERCLONE package (ver.2.0) now includes two new utilities. The first of the two, THE TOUGH-NUTS UTILITY or simply TNU for short, is a parameter driven nibble copier capable of handling a wide range of non-standard protection schemes.

Shortly after the original SUPERCLONE package was released, it came to our attention that there were a number of new programs hitting the market that were not copyable by our (or for that matter anybody elses) backup utility. These programs (DALLAS QUEST, SENTINEL, SLAMBALL) were using protection schemes that hadn't been seen before - things like writing out on track '36' and using extra sectors on a track. Because of their popularity, it was absolutely necessary to again come out with a revision, hence, VER.2.0 with TNU and FMB were hatched.

The TNU consists of three parts:

- (1) NON-STANDARD SECTORS
- (2) SINGULAR SYNC
- (3) REFORMAT A TRACK

It should be noted, that with all three of these options, only a single track at a time can ever be modified. This is because generally the TNU will only be used to repair or correct individual tracks on a disk after first copying using either SUPERCLONE or the FMB (more on this later).

The first option of the TNU, NON-STANDARD SECTORS, allows you to create a track with a number of unusual features. In the standard CBM DOS, normally every track has a set number of sectors. For instance, track number 18 always has 19 sectors. If you check your 1541 manual, you will see that there are actually four distinct regions on every disk. For each of these regions, there is a corresponding number of sectors (see accompanying chart). Well, it so happens that in region #2 (tracks 18 to 24) it is possible to squeeze in one extra sector more than normal. In order for this to be done, the track must be formatted in a special way and that, of course, is one of the things that option no.1 will do for you.

In addition to modifying the number of sectors on a track, NON-STANDARD SECTORS also allows you to change the density of which data is written onto the track. Although to my knowledge this hasn't yet been used as a copy protection method, it certainly could be in the near future. Notice from the chart that track densities are also divided up into the same four regions as discussed above.

REGION	TRACK NUMBER	TOTAL SECTORS	DENSITY BITS
1	1 to 17	21	3
2	18 to 24	19	2
3	25 to 30	18	1
4	31 to 35	17	0

When using this option, a reference sector must be entered. This is so that in the event of multiple sectors with the same header information, a unique sector can be identified and then used as a reference point. In most cases this has not been found to be a critical parameter, and it will generally be safe to use sector number zero as a default unless otherwise specified.

Note that when using this option, the requested RANGE parameter is equivalent to the total number of sectors on the track.

The second option of the TNU, SINGULAR SYNC, is like NON-STANDARD SECTORS also a nibble copier, however it is different in a fairly significant way. Typically, a nibble copier locates the header of a sector, reads in the ten bytes that are assumed to be present, and then reads in the 325 bytes of data that follow the next sync mark (in an encoded format known as GCR). Then, when writing out to the destination disk, the header bytes are placed followed by a data sync mark and finally the data bytes. With SINGULAR SYNC the difference is that no assumptions are made about any header bytes being present. Instead, all that happens is that a sync mark is located, and then the next 256 bytes are read in and then transferred to the destination disk. The final option on the TNU, REFORMAT A TRACK, is a utility that will allow you to do a number of different things. First of all, it will let you recover from some backup making mistakes without having to start all over again from scratch. Suppose, for instance, that you have put an error on the wrong track. Formally you would have had to reformat the entire diskette and recopy all the tracks. Now, you can just select this option, specify the appropriate track, use the default responses on all other parameters, and immediately erase the unwanted errors.

Secondly, you can use this option to create an error number 29 manually anywhere on the diskette. Simply proceed as above except when asked about disk ID specify two values that you know are different from the correct ones. This will produce an ID MISMATCH ERROR no.29 on the selected track.

Finally, this last option can be used to create a special track by specifying non-standard offbytes. Offbytes are two bytes that are used for padding during the binary to GCR conversion of the sector header. Though these bytes are both normally equal to \$0F (15 decimal), they may be changed to some other values and then used as part of a copy-protection scheme.

It should be understood that the kinds of protection schemes and techniques that can be handled via the TNU are varied and complex. There isn't any easy way for the average SUPERCLONE user to determine whether or not he needs to use the TNU, much less discover what values to give to the various parameters. This is the reason that there aren't any operating instructions included with the TNU. Instead, we have relied upon the resourcefulness of our more advanced users to supply the necessary parameters which we then will make available to all our customers over our phones and here in the CLONE NEWSLETTER. They say that a little bit of knowledge is a dangerous thing. I hope not, however, and I decided to present the information on the TNU above in the hopes of spurring some of the more adventurous and/or knowledgeable of you on to new discoveries. Remember, cash and merchandise rewards await those of you who make relevant contributions!

The other major utility included on our latest release is the FOUR MINUTE BACKUP, also known as FMB. This nifty little program will format and copy an entire diskette in just over four minutes. Only a couple of things need to be said about this simple to use backup. First of all, DISCONNECT any device (printer, 2nd drive, etc.) other than your single 1541 drive from the serial port. Turning it off isn't good enough, it must be unplugged from the back of your 1541. Secondly, realize that this program will NOT in most cases make a working copy of a protected disk just by itself. Those tracks reported as errored during the copying should generally be recopied using either SUPERCLONE, FASTCLONE, or the TNU.

MORE DONGLE SOLUTIONS

We have been fortunate enough this issue to have a number of very interesting 'dongle' solutions to publish for our readers. They have all been submitted by enterprising CLONERS who will now be rewarded for their efforts to the tune of either \$15 cold cash or any Micro-W software product free - their choice. So please keep the ideas flowing, and maybe next time your article will be the one that hundreds of fellow newsletter readers see and benefit from.

SOLVING THE DONGLE DILEMA

Here is one solution to the dongle dilemma:
With a little tedious effort, a program could be modified to get around any required dongles, yet there is another way...

Some dongles are little more than simple components read as pots (ed. note: 'pots' or potentiometers are the variable resistors commonly used as paddles in some computer games) in the paddle ports. For those of us with a little hardware orientation, this is not difficult to duplicate so that we can keep back-ups of the dongle itself.

The dongle for RTC's SCRIPT 64 is read as two resistances. 27 k-ohms between pins five and nine, and 10 k-ohms between pins five and seven. See diagram.

This information was obtained by taking resistance measurements between every pair of pins. From these measurements, you need to use a little logic to figure the proper arrangement of the resistors. In this instance, you would find measurements of 27K between 5 and 9, 10K between 5 and 7, and 37K between pins 7 and 9. The reason for this is that pin 5 is common to both resistors, so reading 7 to 9 shows the combination of the two.

Most dongles though, if they are using this resistance method, would have resistors connected to pins 5 and 9 since that is where the computer can read the paddle potentiometer values.

Parts to construct such dongles are readily available from Radio Shack.

27 k-ohm resistors:	# 271-1340
10 k-ohm resistors:	# 271-1335
'D' Sub connector (socket):	# 276-1538
'D' connector HOOD:	# 276-1539

Total cost = approx. \$5.50

I am only familiar with RTC's dongle but I would be interested to hear of the schemes used by any other manufacturers.

Charles Patterson
Tarrytown, N.Y.

Ed. Note: Thank you, Charles. For more dongle related info read on.

How to build a DONGLE for the M'FILE DATABASE program

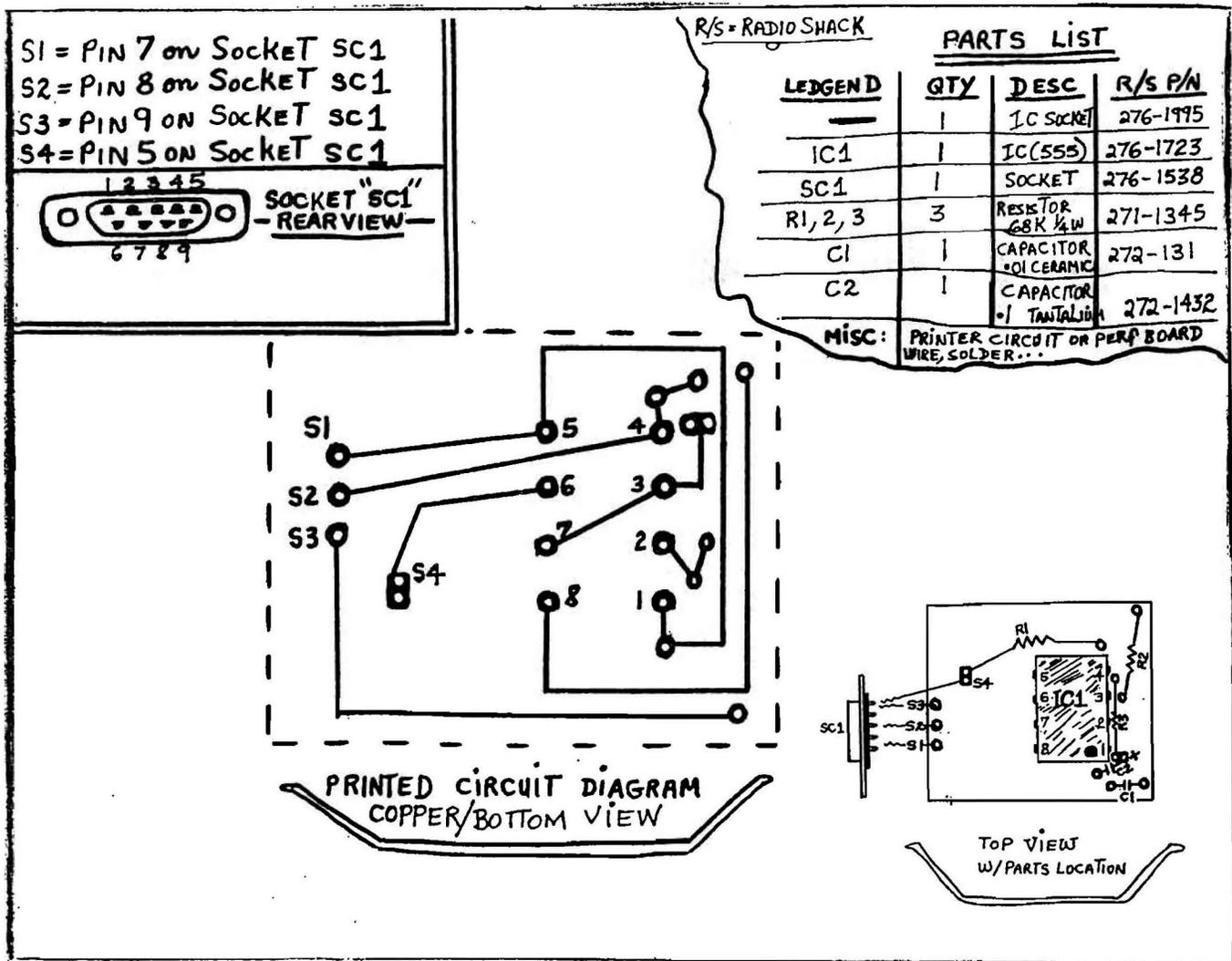
On the following page, find all the necessities to build a key to operate the M'FILE database program. The disk can be copied using CLONE with no complications. I have constructed this key and have had no problems.

To insulate the key, it can be placed inside a small plastic box, or as I have done by making the printed circuit board small enough, into a 35MM film container.

If this solution justifies a reward, please send me some software in lieu of cash.

D. Ostiguy
Bellingham, Wa.

Ed. Note: It certainly does merit a reward, Mr. Ostiguy. Thank you very much for submitting it.



Finally, as our last dongle solution for this issue, we have an example of the alternate route - through software...

Dear Sir:

I would like to submit this article on how to backup 'NEUTRAL ZONE' (protected by a dongle) using CLONE. Using the following method bypasses the dongle plugged into port 1 making it unnecessary to plug it in.

- a) Init.
- b) Copy 16/0 - 24
- c) Edit T/S : 21/10
 - Byte \$70, change \$20 to \$EA
 - Byte \$71, change \$9C to \$EA
 - Byte \$72, change \$85 to \$EA
- d) Edit T/S : 21/18
 - Byte \$C7, change \$20 to \$EA
 - Byte \$C8, change \$9C to \$EA
 - Byte \$C9, change \$85 to \$EA
- e) Edit T/S : 22/13
 - Byte \$7E, change \$20 to \$EA
 - Byte \$7F, change \$9C to \$EA
 - Byte \$80, change \$85 to \$EA
- f) Edit T/S : 22/4
 - Byte \$07, change \$20 to \$EA
 - Byte \$08, change \$9C to \$EA
 - Byte \$09, change \$85 to \$EA

This will bypass the hidden protection from the program 'CODE' by changing all the JSR \$859C's to NOP's. If 'CODE' were to be loaded, they can be found in four locations in the C64's memory: \$853E, \$9575, \$9E1A, and \$9EA1.

Steven Walley
Sunnymead, Ca.

Ed. Note: Terrific, Steve! I'm sure I wasn't alone in being surprised that NEUTRAL ZONE has now gone on to a dongle type protection method. Because of your help, this is not going to be any problem for our readership. Thanks again!

```
*****  
*  
*           WARNING!!!  
*  
* The copy features of the  
* SUPERCLONE package have  
* been developed solely  
* for the express use of  
* making a backup copy of  
* your owned diskette.  
*  
*****
```



1541 WORKSHOPPE: The Job Que - Part 2

In the last installment, the 1541's software operating system was briefly discussed. It was mentioned that it is an interrupt driven system, and that by using something known as the 'job queue' various tasks can be initiated and monitored. In this issue, we will demonstrate how to directly use the job queue to gain control of your drive through simple BASIC program statements.

First of all, it's necessary to understand the structure of the job queue in the 1541's RAM memory. Locations \$00 through \$05 are the six job registers. This is where job codes are stored in order to initiate some task or tasks. The locations \$06 through \$11 are the track and sector registers. They correspond to the job registers as shown in the following chart:

JOB REG.	TRACK REG.	SECTOR REG.	BUFFER AREA
\$00	\$06	\$07	\$0300-\$03FF
\$01	\$08	\$09	\$0400-\$04FF
\$02	\$0A	\$0B	\$0500-\$05FF
\$03	\$0C	\$0D	\$0600-\$06FF
\$04	\$0E	\$0F	\$0700-\$07FF
\$05	\$10	\$11	none

Finally, the seven different job codes, their names, and what they do, are presented in the next chart:

Job Code	Name	Description
\$80 (128)	READ	Read a sector
\$90 (144)	WRITE	Write a sector
\$A0 (160)	VERIFY	Verify a sector
\$B0 (176)	SEEK	Seek a track
\$C0 (192)	BUMP	Bump the head to track 1
\$D0 (208)	JUMP	Jump to a machine lang. routine in buffer
\$E0 (224)	EXECUTE	Execute a machine lang. routine in buffer

In the preceding chart, note that the job code numbers in parentheses are in decimal, and would be used in your BASIC program that way.

Now to see how all this works, let's create a program that will move the head to any track that we specify.

First, we must open the command channel to the 1541:

```
10 OPEN 15,8,15,"10"
```

The '10' isn't strictly necessary, but it's a good idea to always start out by initializing the drive. Next, we'll input the desired track number from the user:

```
20 INPUT "TRACK";T
```

OK, now for the interesting part. First, we must decide which job register to use. This choice is completely arbitrary since we have only one job to perform. We'll choose register \$00, and that means that our track register will be \$06 while our sector register will be \$07. For the job that we're going to initiate - a track seek - the sector register is not used. Thus, the only thing we have to do is write the job code and track number in the appropriate registers, \$00 and \$06, respectively:

```
30 PRINT#15,"M-W"CHR$(6)CHR$(0)CHR$(1)CHR$(T)
40 PRINT#15,"M-W"CHR$(0)CHR$(0)CHR$(1)CHR$(176)
```

Notice that the MEMORY WRITE ("M-W") disk drive command is used. Although this command is documented in Commodore's 1541 manual, its probably worth describing here for those of you not familiar with it. The general form of this command is as follows:

```
PRINT#15,"M-W"CHR$(LO)CHR$(HI)CHR$(NUM)CHR$(X)
```

where... LO represents the lower 8 bits of the address in decimal,
HI represents the upper 8 bits of the address in decimal,
NUM represents the number of bytes you wish to write,
and X represents the value of the byte you wish to write.

Thus, in our case, since the addresses are \$0000 and \$0006, we have:

```
Line 30 - LO = 0, HI = 0  
Line 40 - LO = 6, HI = 0
```

Also, notice that in line 40 the byte we wish to write (the job code) is 176, while in line 30 it is equal to the variable T, our desired track number.

The order of these two last lines should NOT be interchanged. As soon as line 40 is executed, the disk drive will start searching for whatever track number is currently in register \$06. If that number should be garbage (anything greater than 35 or 36) you can be certain that your drive will go out to lunch. If that happens, and an '10' command fails to straighten it out, you may have to physically move the head back to its normal position. Therefore, as a precaution against allowing the user to specify any illegal track numbers, include the following line:

```
25 IF T<1 OR T>35 THEN 20
```

This will effectively prevent you from accidentally specifying a 'bad' track number.

Finally, we need some way of monitoring the progress of the job. We don't want to allow a new job to be written into \$00 until the current track has been reached. For this reason, we add the following lines to our program:

```
50 PRINT#15,"M-R"CHR$(0)CHR$(0)  
60 GET#15,A$:IF ASC(A$+CHR$(0))>127 THEN 50
```

The MEMORY READ command used in line 50, reads a single byte from the address specified in the instruction (it uses the same LO, HI format as the MEMORY WRITE command). In line 60 we test the byte that was read in from the job register, \$00. As was mentioned in the last installment, when a job is finished, the job code is replaced by another number that is always less than 128. This new number is an error code that reflects the final status of the job. Any number other than a one indicates an error condition. Thus, lines 50 and 60 will repeat until the job is finished and the error code is set.

As the final program lines, we need to allow either another track seek or an exit:

```
70 INPUT"ANOTHER TRACK (Y/N)";R$  
80 IF R$="Y" THEN 20  
90 CLOSE15:END
```

This concludes this edition of 1541 WORKSHOPPE. For those interested in this subject, an excellent new book is now available from DATAMOST: INSIDE COMMODORE DOS by Richard Immers and Gerald G. Neufeld.

SOLUTIONS

In this installment of our regular SOLUTIONS department, we're going to publish an exceptional account of software sleuthing by one of our readers.

How to Backup RAID OVER MOSCOW

This program was a tough one. I could tell by the noises the drive was making during loading, that there was a good deal of protection on the diskette. It seemed like a good idea to just investigate the code and see if I could eliminate the protection checking altogether. I have done this in the past on other programs and have usually ended up with a faster load with less abuse to my drive.

Turned out I was able to do it again, and I've outlined the steps below:

- 1) Copy the entire disk using the old CLONE MACHINE or the FOUR MINUTE BACKUP if you have it (don't use SUPERCLONE on this).
- 2) Go into the TRACK/BLOCK editor. Go to track 18, block 12, and change byte \$E1 from \$20 to \$00. This will stop the program after all the error checking has been done and before it starts to run.
- 3) Go to track 18, block 4, and change the first two bytes to: \$00 and \$FF. This will allow you to list the directory.
- 4) Go to track 18, block 0. They've phoned-up the BAM so that there's no available space on the disk, but I found some. Change the 12 bytes starting at \$14 to:
\$15, \$FF, \$FF, \$1F, \$15, \$FF, \$FF, \$1F, \$15, \$FF, \$FF, \$1F
- 5) Now try to load your copy disk. You'll see the drive light blink a couple of times and then it'll just sit there and spin. At that point remove your copy and put in the original disk. As soon as you close the drive door you should see the load continue. The program is now checking out the disk's protection, and since its the original it should pass with flying colors!
- 6) In a little while the program will reach the breakpoint that was added and then return you to BASIC. Now simply save the BASIC part of the program as follows:

```
SAVE "RAID",8      and type 'NEW'
```

Next you'll need to save the machine language program that's residing up at \$C000 to \$C400. I wrote a little program to do this. Type this in and then run it:

```
10 A$="RAID.B":POKE184,1:POKE185,1:POKE186,8
20 X=PEEK(45)+256*PEEK(46)+3:POKE183,PEEK(X-1)
30 POKE187,PEEK(X):POKE188,PEEK(X+1):POKE781,0:POKE782,196
40 POKE251,0:POKE252,192:POKE780,251:SYS65496
```

- 7) After the SAVE is completed type NEW and then the following:
10 IF A=1 THEN LOAD"RAID",8
20 A=1:LOAD"RAID.B",8,1
- 8) Save this little boot program as "START". You now have the

entire RAID OVER MOSCOW program saved on your copy diskette along with the new boot program. To run it just type :

LOAD"START",8

and then RUN. The program should behave exactly like the original did. And of course, the nice thing is that it won't have to do all that protection checking anymore.

P.Sayah
Clifton, N.J.

Ed. Note: An excellent article Mr.Sayah! I'm sure many of our readers will benefit from your example of inspired cloning.

LETTERS TO THE EDITOR

Dear CLONERS,

Just wanted to report on the success I've had with your new TOUGH-NUTS UTILITY. I tried to copy DALLAS QUEST by DATASOFT with SUPERCLONE but had no luck. Took my drive apart and watched the head move during loading. I could tell by watching that the drive was going out to read past track 35. I then used the TNU - NON-STANDARD SECTORS. Tried to copy track 36 using different density bits, again no luck.

Finally I tried TNU - SINGULAR SYNC on track 36 and guess what...it works!!! I have since found out that JUNO, also by DATASOFT, can be copied in exactly the same way. Just copy with the FMB and then use SINGULAR SYNC on track 36. Thanks for a great product!

Dave Kaiser
San Francisco, Ca.

Ed. Note: We appreciate that, Dave. As was mentioned earlier in this newsletter we are counting on our subscribers to keep us informed of their discoveries in using the TNU. Here are some more letters from pioneering TNU users.

Dear Sirs:

I've used just about every copy program on the market, but could never make a backup that worked correctly of my ZAXXON. I played this game a lot and was really worried about losing it.

Well, I recently got your new update with the TOUGHNUTS UTILITY on it. Here's how I was finally able to copy ZAXXON:

- a) Copy disk with FMB.
- b) Load TNU, and select option #1 - 'NON-STANDARD SECTORS'
- c) Answer 'NO' to 'ALTER DENSITY BITS?'
- d) Enter 0 for REFERENCE SECTOR
- e) Enter 20 for RANGE

This will then produce a perfect copy of ZAXXON.

Martin Weseley
Stamford, Conn.

LETTERS TO THE EDITOR (cont.)

Dear Micro-w.

I have been working with the TOUGH-NUTS UTILITY now for about 2 weeks and have successfully cloned two of my most recent additions to my software library: SLAMBALL and SENTINEL. Both of these programs had similar protection schemes involving an extra sector of data on one of the tracks.

- 1) SLAMBALL
 - a) Copy with FOUR MINUTE BACKUP
 - b) Use TOUGH-NUTS - NON-STANDARD SECTORS
 - c) Track = 18
 - d) Alter density bits = NO
 - e) Reference sector = 0
 - f) Range = 20

- 2) SENTINEL
 - a) Copy with FMB
 - b) TNU - NON-STANDARD SECTORS
 - c) Track = 24
 - d) Alter density bits = NO
 - e) Reference sector = 0
 - f) Range = 20

In general I'd say your product is very good, however I think that you really should have included some more documentation on how to use the various utilities in the TOUGH-NUTS section.

Sincerely,
Gene Walden
Miami, Fla.

Ed. Note: Thanks for the help, Gene. Your comment on our documentation (or lack of it) concerning the TNU was reflected upon earlier in this issue and hopefully the situation has been improved.

Dear Sir:

I have used your new TOUGH-NUTS UTILITY to backup WIZARD which is a program that I consider probably one of the most difficult to copy. I couldn't understand at first what the problem was. It seems that (after much analysis and study) this diskette has some very unusual tracks. On tracks 1, 2, and 3, the sector numbers run from 0 to 9, and then from 0 to 10, sequentially! In other words, the only unique sector was number 10. Because of this, was is impossible to copy it correctly until I set the reference sector equal to 10.

Thus, the copy plan is as follows:

- 1) First copy the disk with the FMB.
- 2) Next, load the TNU and select 'NON-STANDARD SECTORS'.
- 3) Select track #1.
- 4) Say 'NO' to 'ALTER DENSITY BITS?'
- 5) Set reference sector equal to 10.
- 6) Set range equal to 21.
- 7) Repeat same parameters for tracks 2 and 3.

John Martinelli
Philadelphia, Penn.

Ed. Note: Seems as though you're the true wizard, John. Thank you!

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