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SyQuest SQ-555 44Mb 5.25" Cartridge SCSI Hard Drive

SyQuest 44Mb SQ555 Removable Cartridge SCSI Hard Drive Operations Manual

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The SyQuest SQ555 cartridge disk drive is a standard-sized, half-height, 5.25" drive having a 44Mb (formatted) capacity with the Small Computer System Interface (SCSI) and utilizing the Common Command Set (CCS).

The SQ400 removable cartridge is a random access storage device utilizing a 5.1-inch aluminum disk with a plated recording layer overcoated with sputtered carbon as storage media. Each disk surface is divided into 1379 total tracks. The first 34 tracks define the outer guard band, and the last 60 tracks define the inner guard band. Each surface of the media contains **1275 data tracks**. There are also 4 alternate tracks, four maintenance tracks and a diagnostic track. The total formatted capacity of the SQ400 with its two heads and surfaces is 44 megabytes. The cartridge can use:

Data Bytes Per Sector	Sectors Per Track
256	68 + 2 spare
512	34 + 1 spare
1024	17

A complete description of the SyQuest SQ555 can be found in the article, "SyQuest SQ555 Technical Manual" on this "*Z-100 LifeLine*" Website.

Operational Functions

Mounting Orientation

The drive is a standard half-height drive, 5.75" wide and 8.25" deep.

The recommended installation orientation is either vertical on either side or horizontal with the PCB (Printed Circuit Board) down. Air flow must be provided to cool the PCBs. The drive mounting frame has perforated holes to allow air flow over the PCB.

Surface Media Preparation

The SyQuest SQ555 is not a diskette drive, nor does it operate exactly like a fixed hard disk drive. When you use the SQ400 disk cartridge, all file directory information is loaded into RAM (System Buffer), NOT read from the cartridge as is the case with a diskette. In most cases, this System Buffer is NOT upgraded by DOS when you change your cartridge. In some cases, your operating system or Host Bus Adapter Driver will make it possible for you to change cartridges.

Note: If your Driver software does not support this cartridge change operation, you must reboot your computer when you change the cartridge to ensure that you do not lose or corrupt data.

Handling Instructions

There are a few general rules to follow when handling either the SQ555 drive or the SQ400 cartridge:
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+ Always observe static discharge precautions when handling your SQ555 drive.

+ Use only SyQuest-approved cartridges.

+ DO NOT TURN OFF the power to the computer to remove the disk cartridge. If power is turned off, wait at least 30 seconds for the drive to stop spinning before removing the cartridge to prevent damage to the recording surface or the read/write heads.

+ Always remove the cartridge before you move the drive or the computer.

+ To keep the cartridge dust free and to protect it from excessive shock damage, Never leave the cartridge partially inserted in the drive and always keep the cartridge in its protective case when not in use.

+ Never open the cartridge; this may contaminate the disk surface resulting in severe damage to the cartridge and possibly to the disk drive.

+ Allow the cartridge to stabilize at room temperature for an hour (in its case) before you use it in an environment with a temperature different from the one in which it was stored.

CAUTION: This precaution includes situations such as moving a cartridge from a cold car to a warm drive, from a hot car to an air conditioned environment, or any similar circumstance.

+ Do NOT DROP the cartridge; this may damage it, causing head crashes and loss of the disk and stored data.

+ Do NOT BULK ERASE!

+ Do NOT EXPOSE the cartridge to magnetic fields.

+ Do NOT apply cartridge labels that will interfere with the operation of the drive, and do NOT mark on the labels with a graphic pencil. The graphite dust from the pencil markings may contaminate the disk surface.

+ Avoid performing operations among multiple versions of your DOS operating system. This may cause loss of data.

Operating System Software

Avoid using the same cartridge with different versions of the operating system. For example, do not use the same cartridge to perform operations for use under DOS v2.x and DOS v3.x. Performing operations between different versions of an operating system may cause loss of data.

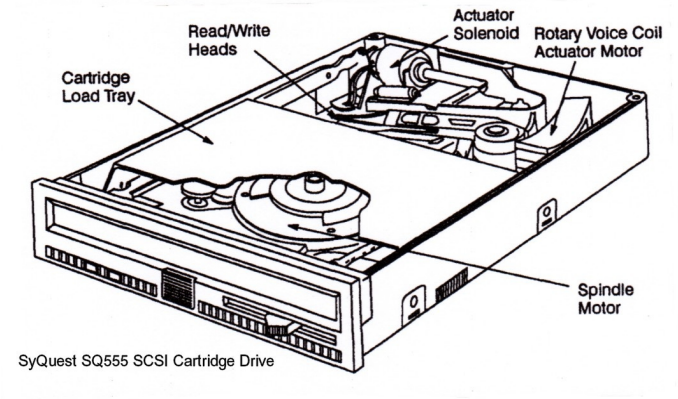


Figure 1.

Preparing the SyQuest SQ555 SCSI Drive

The SyQuest SQ555 SCSI Cartridge Drive has all the normal construction of any SCSI Hard Drive except the actual media platter itself. This provides several advantages over the usual SCSI hard drive systems of the period:

+ The media platter is encased in a hard plastic shell to protect the media platter from contaminants.

+ Reduces the initial cost over that of a similar-sized SCSI hard drive.

+ Reduces the loss, if the media should become unusable.

+ Provides an easily portable means of transporting the media between work and home.

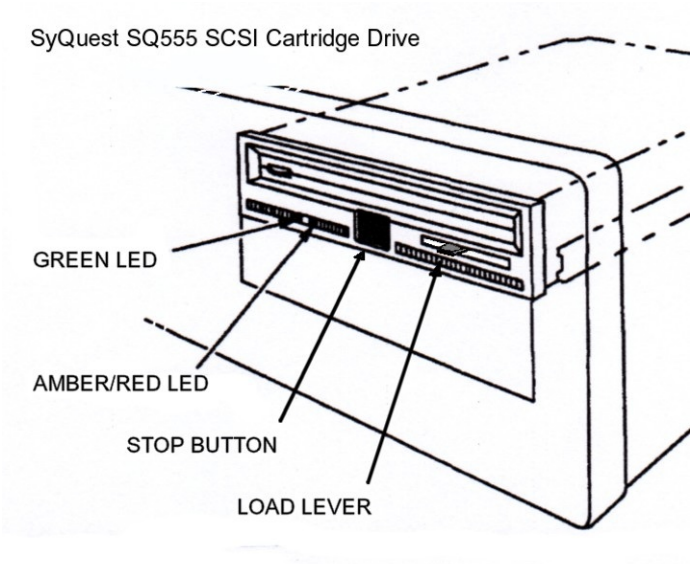


Figure 2.

The front of the SQ555 has two LEDs, a Stop Button, and a Loading Lever to load/unload the media cartridge.

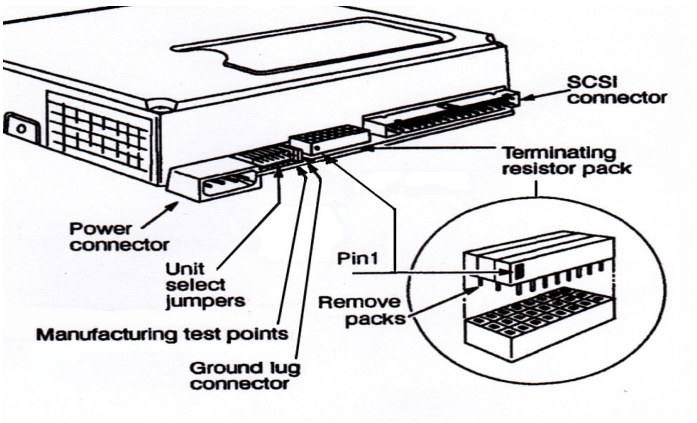


Figure 3.

The back of the SQ555 disk drive has the power connector, unit select jumpers, manufacturing test points, ground lug connector, terminating resistor packs, and the 50-pin SCSI connector (see Figure 3).

If the SQ555 is the last or only SCSI device in the series of devices connected to your computer SCSI bus, you MUST have all three resistor packs installed to meet SCSI bus termination requirements.

Terminal Resistor Packs (3)

If the SQ555 is NOT the LAST or ONLY device, you MUST remove the three resistor packs. The SCSI ID number assigned to your device does not matter; it is the physical location in the device daisy chain that determines the need for terminating resistors. Only the LAST physical device on a SCSI Bus needs the terminating resistor packs.

Note: If you need to reinstall the terminating resistor packs, make sure that the pin 1 (with black dot) is inserted into the correct pin 1 socket. See Figure 3.

Note: The resistor packs are 221/331 (220/330 ohm) 8-pin SIP (single-row) dual-terminator resistor packs that act as a voltage divider network between Vcc power and ground planes.

SCSI ID Jumper

The SCSI ID Number works similar to the drive select number in the floppy world or the MFM hard drive world.

Select a number to use as the SCSI ID number for your unit. You can set the SQ555 to any ID number between 0 (the present, default ID) and 7, but be sure that the number you choose is not already assigned to another device on the same SCSI bus. For example, the SCSI controller generally uses 7 for the ID number.

Once you have set the ID number you want to use, install the ID jumper(s) across the pairs of pins indicated in Figure 4. These pins are in vertical rows. NEVER install a jumper across differently labeled pins (for example, row 'A' pins to row 'B' pins).

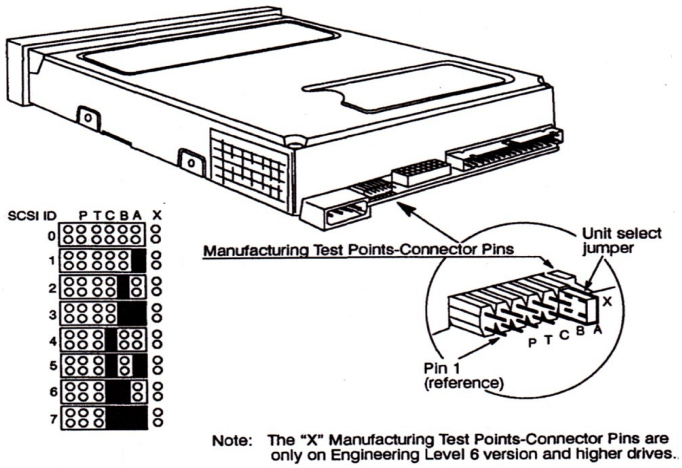


Figure 4.

Note: No jumper is required if you have only one SQ555 attached to your Host Bus Adapter; the device is preset for ID '0'.

Note: Do NOT confuse the Manufacturing Test Points labeled 'X' with the ID Select Pins. These manufacturing test point pins 'X' are incorporated on Engineering Level 6 drives and up only. These pins are a 7th pair of pins to the right of the ID Select Pins, see Figure 4.

Note: Only SCSI devices that are on the same SCSI bus have ID numbers that affect each other. All SCSI devices attached to the same SCSI bus require a unique ID number. If you have more than one Host Bus Adapter in your system, you can have duplicate SCSI ID numbers - as long as they are on a different host adapter. Also, SCSI ID numbers have no affect on non-SCSI devices on your system.

SQ555 Diagnostics

One of the first things you will notice upon power up is the delay before coming on-speed and ready, at least with my CDR-317 and LLSCSI controllers.

The SQ555 firmware resides in the ROM mounted on the main logic board. The firmware contains all the routines necessary to execute supported SCSI commands, run the microcontroller, and perform self-test diagnostics. This article will only give a brief overview. Please see the article "SyQuest SQ555 Technical Manual" on this website for additional details.

Power-Up Test

When power is applied to the drive's main logic board, the start-up routines in the SQ555 ROM execute a series of tests on the drive's electronic components to establish the readiness of the drive. The first test is a checksum operation on the SQ555 ROM. If this test passes, a series of reads and writes test the microcontroller's registers, internal RAM, scratch pad RAM, and the buffer RAM.

Drive Performance Diagnostics

There are 5 Drive Performance diagnostics tests that the SQ555 can execute. The tests are numbered 0-3 and 6. You select the tests by putting a jumper on the 'T' selection pins and another jumper across the unit select jumper pins 'A', 'B', or 'C', depending on the test desired:

```
Test 0    - Install no other jumpers.
Test 1    - Insert jumper on Pins 'A'
Test 2    - Insert jumper on Pins 'B'
Test 3    - Insert jumpers on 'A' & 'B'
Test 6    - Insert jumpers on 'B' & 'C'
Test 7    - Reserved; DO NOT USE!
```

These jumpers must be set prior to powering up the drive. A description of each test follows. All tests cycle continuously, stopping and starting the spindle once each cycle.

A. TEST 0
TEST 0 is a seek-read test of the entire media. The test consists of a sequence of 256 random seeks, followed by two incremental reads of the entire disk surface, repeated six times.

B. TEST 1
TEST 1 is a random seek-read media test. The test consists of a sequence of 256 seeks followed by 35 random reads, repeated twice.

C. TEST 2
TEST 2 is a seek test of the media. The test consists of 25,600 random seeks, repeated once. Any errors encountered will cause the test to terminate early. Blinking front panel LED's indicate the failure type. See Table 1.

D. TEST 3
TEST 3 is the same as TEST 2, except that any errors encountered do NOT cause termination.

E. TEST 6
Test 6 is a write-read test of track 1279. The test consists of a seek to the diagnostic track, followed by an incremental write-read operation by sector, until all sectors for that track have been tested, repeated once.

F. TEST 7
WARNING: TEST 7 is reserved for SyQuest use. Customers should not use this function; the data stored on the disk will be destroyed!

LED Operation

The SyQuest Cartridge Disk Drive has two status indicator LEDs on the front panel, see Figure 1. They provide drive status and failure diagnostic information.

The GREEN and AMBER/RED front panel LEDs report errors encountered during the power-up and diagnostic tests. These LEDs are flashed a variable number of times, depending upon the error encountered during the power up sequence test or during the diagnostic testing. The error code displayed by the LEDs cycles continuously, with the GREEN LED flashing a number of times first, followed by the AMBER/RED LED flashing.

Table 1. LED Error Reporting Table

Number of LED Blinks GREEN	ORANGE	Error Description
0	1	Too many files created / wrong cartridge used
0	2	Maintenance track read error
0	3	Maintenance track write error
0	4	Drive NOT Ready
0	5	No spare maintenance sectors
0	6	Cartridge write protected
0	7	Self test FAT/FED sector full
1	1	EPROM failed checksum test
1	2	Microctrlr internal RAM failure
1	3	Scratchpad RAM failed
1	4	Self test seek error
1	5	Seek error
1	6	Read error
1	7	Write error
2	1	Disk controller (SERDES) failed
2	2	SERDES Sequencer RAM test 1 fail
2	3	SERDES Sequencer RAM test 2 fail
2	4	R/W bufr RAM addr reg test1 fail
2	5	R/W bufr RAM addr reg test2 fail
2	6	R/W bufr RAM test 1 failed
2	7	R/W bufr RAM test 2 failed
3	1	R/W bufr RAM port 0 failed
3	2	Amber/Red/Grn LEDs port fail
3	3	R/W bufr RAM port 2 fail
3	4	Self test write error (scan proc)
3	5	Invalid self test number
4	1	Spindle motor failed to start
4	2	Spindle motor not to speed
4	3	Spindle motor spins too fast
5	1	PwrSuply fail (voltages OOS)
5	2	Spindle motor speed OOS
5	3	No servos detected after spin-up
5	4	No servos found head 0 (bad)
5	5	No servos found head 1 (bad)
6	1	ADC calibration failure
6	2	ADC high current failure
6	3	ADC low current failure
off	flash	Failed power-up sequence; Possible defective cartridge; Heads not loaded; Possible defective drive.

If any errors occur, recheck procedures.

DC Power Requirements

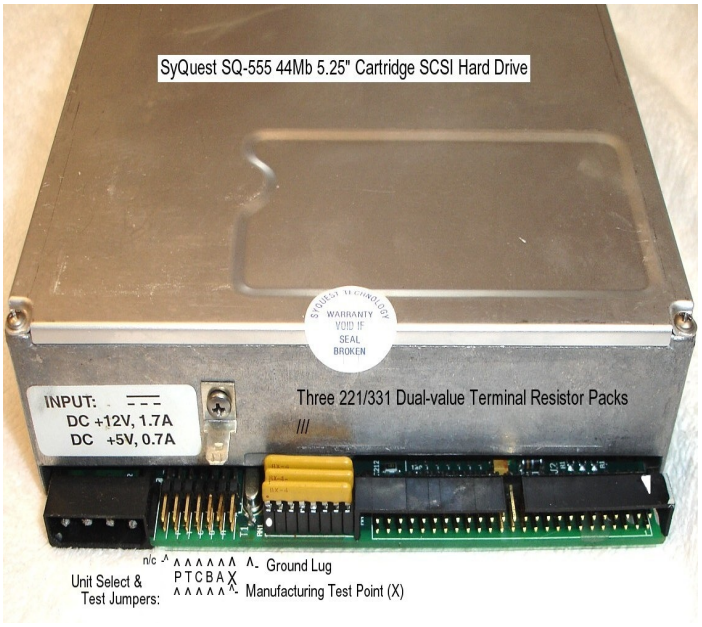
Pin:	Voltage:	Amperage:
1	+12 Vdc ±10%	2.0 A maximum 1.7 A running
2	+12 Vdc Ground	
3	+ 5 Vdc Ground	
4	+ 5 Vdc ±5%	0.8 A maximum 0.8 A running

Wattage:	Typical	Maximum
Spin-up	24.8 Watts	28.0 Watts
Running	22.0 Watts	24.0 Watts

Here are some more pictures of the SyQuest SQ555 cartridge hard drive:

SyQuest SQ-555 44Mb 5.25" Cartridge SCSI Hard Drive

SyQuest SQ-555 44Mb 5.25" Cartridge SCSI Hard Drive



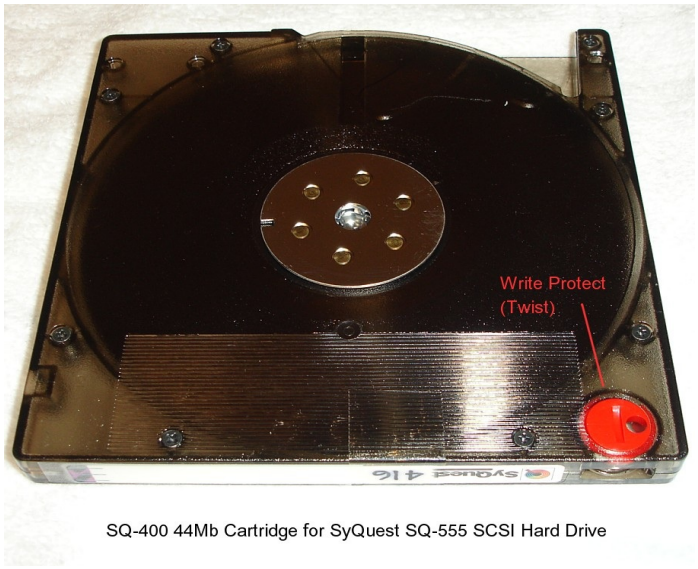
The SQ400 Cartridge Media

As mentioned earlier, the SQ400 removable cartridge is a random access storage device utilizing a 5.1-inch aluminum disk with a plated recording layer overcoated with sputtered carbon as storage media. Each disk surface is divided into 1379 total tracks. The first 34 tracks define the outer guard band, and the last 60 tracks define the inner guard band. Each surface of the media contains **1275 data tracks**. There are also 4 alternate tracks, four maintenance tracks and a diagnostic track. The total formatted capacity of the SQ400 with its two heads and surfaces is 44 megabytes. The cartridge can use:

Data Bytes Per Sector	Sectors Per Track
256	68 + 2 spare
512	34 + 1 spare
1024	17

The cartridge measures about 5.4" wide x 5.4" long x 0.5" thick.

SQ-400 44Mb Cartridge for SyQuest SQ-555 SCSI Hard Drive



SQ-400 44Mb Cartridge for SyQuest SQ-555 SCSI Hard Drive

Write Protecting

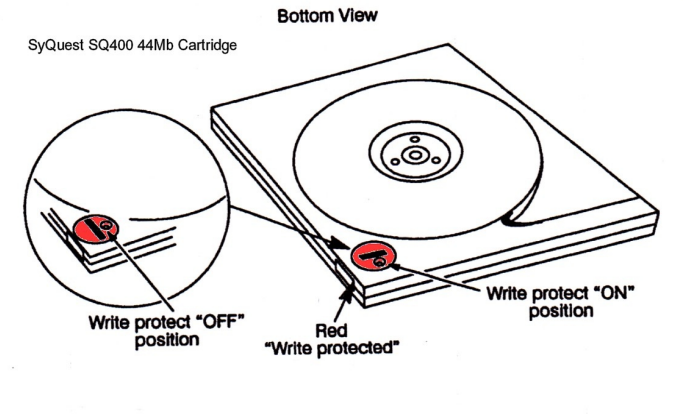


Figure 5.

When a cartridge is write-protected, you can only read information from the disk; new data cannot be recorded on the cartridge and you can not change the data that is on the cartridge.

When the write protect plug is parallel to the side of the cartridge, you can put new files on the disk (write or store data), change the data on the cartridge, and read (retrieve) data.

CAUTION: The write protection DOES NOT protect against data loss from age. Like other magnetic media, data retention is lost over time simply from the weakening of the magnetic media to hold data. Because of analysis with the similar, but smaller SyQuest SQ200 media, I DO NOT recommend use of this media for long term data storage.

Inserting and Removing Cartridges

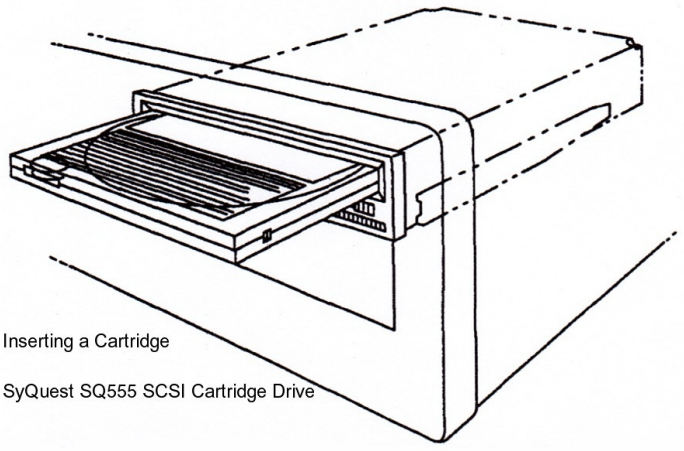


Figure 6.

CAUTION: To prevent damaging the SyQuest drive or the cartridge, do NOT insert a cartridge until the system is powered ON and the hand prompt is displayed! Also, do NOT turn the system off with a cartridge in the drive! The exception is when doing the diagnostics tests.

To Insert a Cartridge:

1. **WITH SYSTEM POWER ON,** hold the SQ400 disk cartridge so the cartridge head access door is toward the drive and the red write-protect button is on the bottom.

2. Insert the cartridge into the drive through the drive door, see Figure 6. When the cartridge slides into the drive and comes to a stop, the load lever pops out.

3. Push the load lever to the left until it is flush with the front panel. The AMBER/RED LED light starts to flash as the drive begins to spin up the disk.

4. When the AMBER/RED LED on the front panel is steady, the disk has completely spun up and the head load process is underway.

5. When the AMBER/RED LED goes out and the GREEN LED is steady, the drive is Ready.

Note: In some cases, your drive may stop during the startup sequence and display a repeating sequence of flashing LEDs. These flashes indicate that an error has occurred. See Table 1 on page 4. for a list of errors.

To Remove a Cartridge:

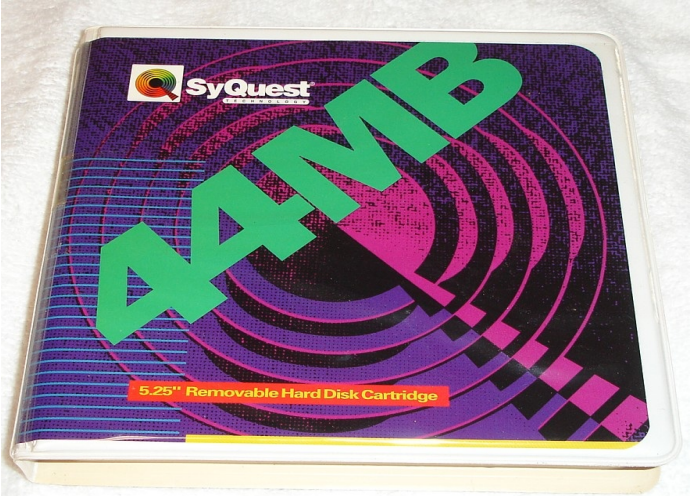
1. To remove a cartridge, press the STOP button; refer to Figure 2. The cartridge load lever pops out, the AMBER/RED LED begins flashing, and the drive begins spinning down the disk.

CAUTION: Do NOT proceed until the disk has completely spun down, which is indicated when the AMBER/RED LED on the front panel goes out. This takes about 10 seconds.

2. When the AMBER/RED LED goes out, push the load lever to the right until it is flush with the front panel. The cartridge ejects.

3. Remove the cartridge and place it in its protective case.

SQ-400 44Mb Cartridge for SyQuest SQ-555 SCSI Hard Drive



SQ-400 44Mb Cartridge for SyQuest SQ-555 SCSI Hard Drive

SQ-400 44Mb Cartridge for SyQuest SQ-555 SCSI Hard Drive

CAUTION: It is important that you always remove the cartridge BEFORE you turn off your computer. If you turn off the computer first, the automatic disk spin-down operation does NOT occur, and the disk will freewheel for up to 30 seconds before it stops spinning. If you attempt to remove the cartridge during this time, you may damage the cartridge, the heads, and possibly lose data.

Formatting the Cartridge

Each time you use a NEW SQ400 cartridge, you must prepare the disk for use, similar as you would a new fixed disk drive. In most cases, for use in the Heath/Zenith computer, it involves using the Zenith Hard Drive Utilities; PREP, PART, ASGNPART, and FORMAT.

We will describe each of these utilities while testing the SyQuest SQ555 Cartridge Hard Drive System in the Z-100, here in a little bit.

Operating Notes

* Handle the disk drive with extreme care.

* The computer must be turned ON and at the Hand Prompt BEFORE the disk cartridge can be installed in the SyQuest SQ555 hard drive. But after the cartridge is loaded, your computer will boot DOS or CP/M? from the SyQuest SQ555 rigid drive. I could NOT get this to work. Read on.

* DO NOT SHUTDOWN the computer until the cartridge has been removed from the SyQuest hard drive or damage may occur to the cartridge, the drive, or both!

* Do NOT blow into a disk drive to remove dust or other contaminants, or for any other reason.

* Do NOT move the disk drive or the computer with a cartridge installed.

Z-DOS v2: Insert the cartridge into the rigid disk drive BEFORE booting the system and do NOT remove it until you are ready to reset or reboot the computer. After booting, use the ASSIGN command to assign any partition on the cartridge to a drive letter.

ZDOS v3+: Cartridges can be replaced anytime it would be valid to replace floppy disks. This, and later versions, automatically assigns a drive letter when a new cartridge is inserted into the rigid disk drive.

My Testing Configuration

Reportedly, the SyQuest SQ555 can be directly connected to the CDR-317 SCSI Controller's 50-pin connector. We shall thoroughly check this out. The arrangement looks like this:

C.D.R. Systems CDR-317 SCSI Controller with SyQuest SQ555 Cartridge Hard Drive

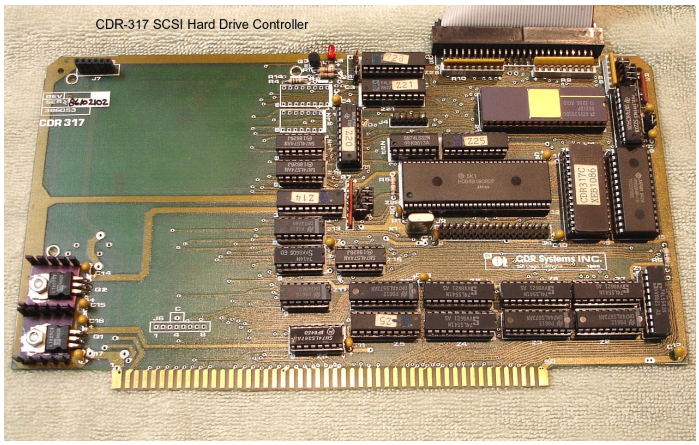
NOTES:

* When the CDR-317 SCSI controller is used, the three terminating resistors MUST be installed on the CDR-317 Board in sockets R8, R9, and R10, with the dot (ground side) away from the + symbols.

* **PREP Entry for the CDR317 & SYQUEST Drive:** I do not know the actual PREP parameters for the SyQuest SQ555 44Mb cartridge drive, however I did not wish to use the PREP /K switch as this makes the drive unusable with other, older operating systems. So I wanted to keep the size <32Mb.

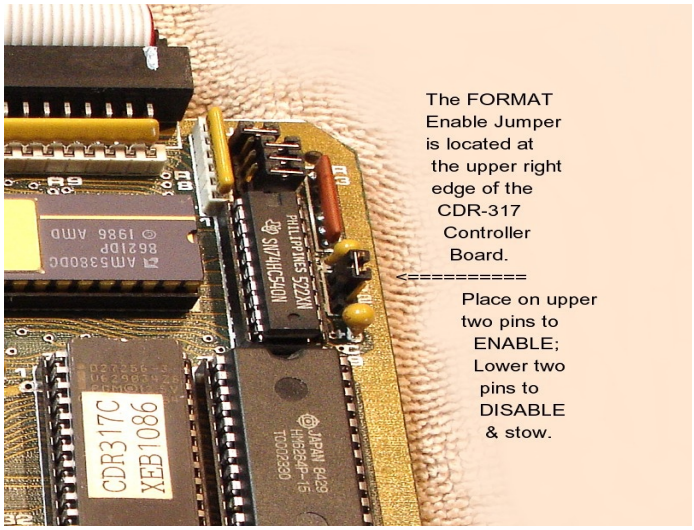
  As we only have two heads, we can only limit the number of cylinders used. The SQ400 uses 1275 data tracks. So, for testing purposes, I changed the PREP parameters to:

Drive:	Hds:	Cyl:	Rwc:	Pcmp:	Step:	Ship:
SQ555	2	400h	0	0	2	450h



For my Testing, I used the arrangement pictured on my test bed Z-100 with a full 768Kb RAM on a new motherboard running at 9.44MHz or 5.3MHz.

Remember to install the FORMAT Enable jumper on the CDR-317 hard drive controller. It is located at the upper right edge of the board:



While using the standard H/Z-217 Hard Drive Controller, if you neglect to install the FORMAT Enable jumper, ZDOS V4 PREP will warn you to install the jumper. However, if you neglect to install the jumper on the CDR-317, PREP just continues to list bad sectors as:

"Formatting CYLINDER, format error."
"Formatting CYLINDER, format error."
...continuously...

So if you see these being listed continuously, check that the FORMAT Enable jumper was installed on the upper two pins of JJ2.

The testing procedures I intended to use were simple:

I would boot to the ZDOS v4.06 hard drive utilities disk and run PREP /T1/Q using the SQ555 parameters:

Drive:	Hds:	Cyl:	RWC:	Pcmp:	Step:	Park:
SQ555	2	400h	0	0	2	450h

I would enter each parameter, when asked by PREP. Then, PREP v4.06 would normally run like this:

"Formatting DRIVE...completed"
"Media test in progress, Pass 1 Writing CYLINDER (CYL#)"

where (CYL#) would run from 0 to 1022 cylinders. If there were bad sectors detected, it would list them as the testing progressed.

When the Writing CYLINDER was complete, the message would change to:

"Media testing in progress, pass 1 Writing CYLINDER Reading CYLINDER (CYL#)"

Again, if there were bad sectors detected, it would list them as the testing progressed.

When complete, the format would begin again:

"Formatting DRIVE...completed"
"Re-checking final format. Reading CYLINDER (CYL#)"
"A:\>"

As you may recall, at this point, while using the earlier versions of ZDOS, you would need to perform a warm boot between the commands PREP, PART, and FORMAT. But I was using ZDOS v4, so the warm boots were no longer necessary.

I would next run PART to create the partitions:

ZDOS3	40%	(Size to be determined) KB
ZDOS4	50%	(Size to be determined) KB
CPM85	10%	(Size to be determined) KB

Next, I intended to run **ASGNPART 0:ZDOS4 F:**, so I could then run **FORMAT F:/s/v**, and load the rest of my desired ZDOS v4 programs.

Rebooting to my ZDOS v3 floppy disk, I would run **ASGNPART 0:ZDOS4 E:**, then run **FORMAT E:/s/v**, and load the rest of my ZDOS v3 files.

Finally, after testing the drive was working properly, I could dig out my CP/M-85 manual and disks, and load the operating system to the drive for testing.

However, things did not go as planned...

Problems

While using the CDR-317 setup above, the failures were pretty obvious:

"Formatting drive...completed"

This happened instantly. But I did not think much of it at the time. Then I began getting:

"Media test in progress,
Pass 1 Writing CYLINDER (CYL#)"
"Media test in progress,
Pass 1 Writing CYLINDER Reading CYLINDER (Cyl#)"

Where (Cyl#) counted from 0(00h) to 1022(400h), and was successful for both Writing and Reading; then the errors began in Pass 2, as:

"Formatting DRIVE...completed" (Instantly)
Re-checking final format, Reading CYLINDER 0,(00h)
"Bad sector 1,(01h), continuing with Pass 2 Reading CYLINDER (CYL#)"
"Bad sector 2,(02h), continuing with Pass 2 Reading CYLINDER (CYL#)"

...continued, with ALL bad sectors...

I pressed {CTRL}-{C} to abort the testing.

I reran PREP v4.06 with:
0, 2, 400h, 401h, 401h, 1, 450h

but got the same results.
I reran PREP v4.06 with:
0, 2, 400h, 0, 0, 1, 450h

but, again, got the same results.

It appeared that the initial formatting of the drive was not actually formatting anything, as it was instantly completed, just skipping the format, and that the actual writing and reading at each sector was appearing to work - or it would list the bad sector and then continue the process. But after reporting to format the drive again - still instantly - then, it would now fail at reading the sectors? Strange.

Next I tried moving the FORMAT Enable jumper on the CDR317, and tried PREP v4.06 again:
0, 2, 400h, 0, 0, 1, 450h

As expected, I got the errors:

"Formatting DRIVE...Format Error."
"Formatting CYLINDER Format Error."
"Formatting CYLINDER Format Error."
...continued.

So, the FORMAT Enable was necessary. I reset it correctly and rebooted to try PREP again. But now the errors remained as:

"Formatting DRIVE...Format Error."
"Formatting CYLINDER Format Error."
"Formatting CYLINDER Format Error."
...continued.

Obviously I mucked something up on the disk...

I removed the cartridge and shut down.

Next I tried removing the 3 terminal resistor packs on the CDR317, reasoning that the drive already had the resistor packs installed...

After powering up and reinserting the cartridge, PREP made no change in the errors. I removed the cartridge and shutdown. I reinstalled the resistor packs and gave up for the day.

The next day I tried to duplicate the first run with PREP v4.06 using:
0, 2, 400h, 0, 0, 2, 450h

Got the same "Formatting DRIVE" errors. Tried:
0, 2, 300h, 301h, 301h, 2, 450h ... Same
0, 2, 300h, 0, 0, 1, 450h ... Same
0, 2, 300h, 301h, 301h, 1, 450h ... Same

Tried rebooting and running PREP, v2.01:
0, 2, 400h, 0, 0, 2, 450h

"Initializing the disk...completed" (instantly)
"Media test in progress, Pass 1"
"Track 0 contains bad sector(s)" (about 5 minutes)

I reran PREP v2.01 for:
0, 2, 300h, 301h, 301h, 2, 450h
0, 2, 300h, 0, 0, 1, 450h
0, 2, 300h, 301h, 301h, 1, 450h

but continued to get these same Track 0 errors.

After removing the cartridge, I shutdown and tried slowing the computer to 5.3 MHz. After powering up and inserting the cartridge, I reran PREP v2.01:
0, 2, 400h, 401h, 401h, 1, 450h

The errors changed to:

"Initializing the disk..." (Instantly)
"Error during formatting of the drive"
"A:\>"

Why the change?

I continued with PREP v2.01:
0, 2, 300h, 301h, 301h, 2, 450h
0, 2, 300h, 0, 0, 1, 450h
0, 2, 300h, 301h, 301h, 1, 450h

But, in addition to these same formatting errors, I also saw that the SyQuest drive's GREEN LED remained green the entire time with no interruptions and no orange pulses, indicating that the drive was not doing anything. Also, I noticed the CDR-317 controller's LED was no longer flashing bright-dim-bright-dim normally, but rather 8 or 9 quick flashes in a row, than off briefly, before starting the count again; I suspect the controller lost communications with the drive?

Following a warm boot, I again ran PREP v2.01 with:

0, 2, 400h, 0, 0, 1, 450h

and we were back to the previous media test errors:

"Initializing the disk...completed"
"Media test in progress, pass 1"
"Track 0 contains bad sector(s)."

Continued with PREP v2.01 for:

0, 2, 400h, 0, 0, 1, 450h
0, 2, 300, 301, 301, 1, 450h
0, 2, 300h, 0, 0, 2, 450h

And each time the Initializing was instant and the Track 0 error took about 5 minutes.

Since the errors had changed, I thought I would reboot to ZDOS v4.06, and try PREP v4.06 again:

0, 2, 400h, 0, 0, 2, 450h

"Formatting DRIVE...completed" (instantly)
"Media test in prograss, pass 1 writing CYLINDER (CYL#)",

which, when completed, changed to:

"Media test in progress, pass 1 Writing CYLINDER Reading CYLINDER (CYL#)"
"Formatting DRIVE...completed" (instantly)
"Re-checking final format. Reading CYLINDER 0,(00h)"
"Bad sector 1(01h). Continuing with pass 2 Reading CYLINDER"
"Bad sector 2(02h). Continuing with pass 2 Reading CYLINDER"

... continued listing bad sectors until I pressed {CTRL}-{C} to abort.

As usual, I retried PREP v4.06 with the usual settings, all to the same sequence of errors.

So close, and yet so far...

I also tried earlier versions of PREP back to v2.22, while changing the ZROM v4.3 to ZROM v2.5, v3.2 and v4.24 and tried all the tests again. While the messages varied slightly, but mostly the Track 0 errors, I got the same disappointing results.

I feel I have tried all that I can.

Conclusions

This SyQuest SQ555 drive could be impressive - if I could only get it to work. I tried another cartridge, tried changing the Z-100's speed and even tried several earlier ZROM's and ZDOS's. But the results were always the same - very disappointing.

I felt so close to having a working SCSI unit, but can not seem to get to success. I must be missing something - or maybe it is just a bad SyQuest SQ555 drive?

This SQ555 has internal self-tests and even diagnostics, and I tried performing Test0, but while I may have done something wrong - you need to turn on power and turn off power with a cartridge installed (against earlier warnings) the testing appeared to be working, but sounded like a coffee grinder - are the heads scraping across the disk surface?

I did not hear any of that during the formatting attempts. Was it normal?

After about 10 minutes of that, I pressed the 'Stop' button on the front panel and gave up.

I tried PREP again to ensure I had not damaged the heads, but the results were the same errors displayed previously.

Perhaps one of you could advise me where I am failing, but the procedures appear to be so easy, I find it difficult to believe that I am missing something.

Next, I changed out the CDR-317 Controller and replaced it with the LifeLine SCSI/EEPROM Controller that I also wanted to check out. This combination worked well and is reported in the "LLSCSI Controller Manual" article on the web site.

This testing with the LLSCSI Controller showed that the SyQuest SQ555 cartridge drive was working fine.

So, I can only conclude that while the CDR-317 SCSI Controller can reportedly work just fine with SCSI hard drives, it does have an issue working with the SyQuest SQ555 drive. I'm sorry that I could not get it to work. I was looking forward to being able to change the operating system simply by changing cartridges.

If you have any questions or comments, please email me at:
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Cheers,

Steven W. Vagts