INTEGRATION INFORMATION
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IBM OEM STORAGE PRODUCTS   DATA SHEET 0662001
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  0662 MODEL S12 & SW1

  1GB Disk Drives

  | GENERAL INSTALLATION TIPS |

Cooling

This drive requires airflow in order to fulfil its reliability
performance.

Please refer to Environmental section of the 0662 Hardware Disk
Drive product specification for full details of the maximum allowable
temperatures and measurement points.

Operation at excessive temperatures will void the drive warranty.

Integration into using System

THE DISK ENCLOSURE IS NOT AT GROUND POTENTIAL

The mounting bushes are insulated from the drive. Any user mounting
scheme must not result in the disk enclosure being shorted to ground.
Drive malfunction will result if this occurs.

The correct length screws must be used (3.8mm penetration). Maximum
torque values must not be exceeded (0.45Nm), (See Below).

Torque Specification

The present torque specification for the mounting screws is at 0.8Nm.
This level has resulted in several insert related problems. Thermal
cycling testing and high stress vibration testing performed shows
that the required amount of torque on the mounting screws to be
0.45Nm (4 in-lb).

So, we plan on making the change to 0.45Nm (4 in-lb). This level is
for all types of inserts for all mounting holes.

In March 1994, there will be an EC to change the inserts from plastic
to metal. This will not change the form or fit, and will improve
function. This insert will still require the same torque setting of
0.45Nm (4 in-lb).

Fast SCSI

The ANSI SCSI committee recommend that fast SCSI devices (such as 0662) must have cable lengths of less than 3 meters and must use active terminators.

0662 has onboard active terminators which are jumper selectable.

Mode Select Parameters

One of the many advantages of the SCSI interface is the provision of user-programmable (mode select) parameters to allow devices to be customized and optimized.

These parameters are fully described in the 0662 functional specifi-cation. Further advice is available from IBM OEM Technical Support.

Compatibility

Testing should be carried out to ensure that the drive is fully compatible with the using system.

System BIOS, Operating System, Device drivers and interface card BIOS/ characteristics can affect the ability to attach the drive to the system. All need to be verified jointly as compatible with the drive.

| SCSI ATTACHMENT INFORMATION |

Synchronous Data Transfer Requests

In the default (shipped) setting, the drive initiates the negotiation for synchronous data transfer rate during the initialization sequence.

(Synchronous Data Transfer Request - SDTR). This may cause problems with some SCSI controller cards which do not conform to the ANSI SCSI specification.

The drive synchronous data transfer request may be switched off by jumpering the 'Disable T.I. sync negotiations' jumper.

The SCSI controller will then negotiate with the drive for the highest common bus speed.

Idle Time Functions

The 0662 has advanced self-diagnostic features. If this is not supported in the specific application, the time taken to update the drive's internal status tables may cause problems, especially in high speed or very long data transfers. Mode select Page 0 Byte 5 Bit 0 (LITF) will disable the main idle time features when set to "1" (see functional specification).

Attachment Tips -

Autostart Jumper is required for any adapter or system that does NOT
issue START UNIT commands, e.g. Adaptec 1542C.

Operating Systems -
    DRDOS 6.0 does not support partitions > 1GB
    UNIX Boot Partition limit usually 1024 cylinders

    | ATTACHMENT TO SPECIFIC SYSTEMS/SCSI CONTROLLERS |

PC - SCSI Adapters

The following SCSI Adapters have been evaluated with the 0662 drives
on typical ISA/EISA/MCA platforms with a range of operating systems.
Any limitations are noted below.

ISA Bus Adapters

 ADAPTEC 154BS6 - ASPI4DOS reqd. for drives > 1GB
 ADAPTEC 1542C
 BUSLOGIC BT545S
 FUTURE DOMAIN TMC 885M AT Bus
 FUTURE DOMAIN TMC 1660 SCSI-2
 FUTURE DOMAIN TMC 1670 ISA/16
 FUTURE DOMAIN TMC 1680 SCSI-2
 FUTURE DOMAIN TMC 7000 FAST SCSI-ISA/16

EISA Bus Adapters

 ADAPTEC 1720
 ADAPTEC 1740A 32-bit EISA
 ADAPTEC 1744 differential
 DPT PM2012A/95 32-bit EISA - partition limit of 1GB
 DPT PM2012A/90 - partition limit of 1GB
 FUTURE DOMAIN TMC7000EX 32-bit EISA
            (partition limit of 512MB)
 BUSLOGIC UT 7475

Microchannel Bus Adapters

 ADAPTEC 1640
 FUTURE DOMAIN MCS-600
 FUTURE DOMAIN MCS-700 - Partition limit 1GB
 IBM Spock Prime
 BUSLOGIC BT 6465

    | DEC SYSTEMS |

```
Platforms                 DEC Station 3100
                          ----------------
                          DECVAXStation3100
                          DECMicroVax3100

Operating System          VMS V5.5
                          VMS V5.6
```

Note: Attachment to earlier versions of the VMS operating system is
      not possible.

Configuration Required:

 Alter MODE SELECT Page 1, Byte 2 to '04'
 Alter MODE SELECT Page 7, Byte 2 to '04'

         ****

```
Platforms                 DEC Station 3100
                          ----------------
                          DECVAXStation3100
                          DECMicroVax3100

Operating System(s)       Ultrix V4.1
                          Ultrix V4.2
```

Configuration Required: Disable SDTR as above

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Platforms                 DEC Station 5000
                          ----------------

Operating System(s)       Ultrix V4.1
                          Ultrix V4.2
```

Configuration Required:

 No modifications to the drive are required. However, it is necessary
 to modify the list of device types in the table of known drives con-
 tained in the 'usr/sys/data/scsi-data,c' system file as follows:

 Change first line from:
 /*UNKNOWN DISK*/to/IBM OEM*/.
 Following this change, the operating system kernel must be rebuilt
 (recompiled).

| SUN SYSTEMS |

```
Platforms(s)              SUNSparcStation
                          ---------------
                          IPC etc.

Operating System(s)       SUNOS V4.1.2
                          SUNOS V4.1.3 or later.
```

Note: Attachment to earlier versions of operating system is not
      possible.

Some CPU boxes have inadequate cooling and internal clearances to allow internal installation of the 0662. See cooling requirements above.

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Device Parameter Settings Declared to System:

The system will accept a wide range of settings provided these do not result in the total number of data sectors declared (Data Cylinders x Heads x Sectors per track) exceeding the number available on the drive.

One set of parameters which work and give a close system estimate of formatting time is:

```
        Cylinders:  569
   Alt. Cylinders:  2
            Heads:  61
          Sectors:  59
              RPM:  5400
```

```
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| WARNING |
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Do not interrupt a format on this system. Format sometimes takes longer than displayed on system.

Interrupted drive will go into degraded mode, and will not be accessible by the Sun system.

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| APPLE SYSTEMS |
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Platforms   APPLE

                             MAC/QUADRA

Operating System(s)   Proprietary (supplied with platform)

Configuration Required:

 Some Apple Systems require disabling the first unit attention after a power-on or a SCSI bus reset to allow installation as the boot drive. This is accomplished via a jumper on the 0662 drive.

        Spitfire S12 attachment to Apple Quadra 800

1.0 Problem Description

    The standard software coming with the Apple Quadra 800 does not reliably recognize the IBM 0662 S12 as a valid drive, neither as a secondary nor as a bootable drive. Even when using a third party device driver, the installation of the Apple system will not be completed successfully. Also during start-up, the IBM drive occasionally spins down and does several resets.

2.0 Problem Solution

2.1 Installing the S12 as a secondary drive

    To work properly in a Apple system, there is a special micro code
    (Release version 2.2) for the 0662. This micro code can be down-
    loaded to a Generic OEM 0662 S12 (PN 45G9466) using an Adaptec
    SCSI controller and the CODEUPDT software, or by ordering a special
    version (PN 45G9504) of the S12. 45G9504 will shortly become the
    standard OEM p/n, attachable to all platforms which meet SCSI 2.

    Installing the drive with the following jumper settings:
    - Auto Start
    - SCSI ID = 1

    For formatting and partitioning the drive, a third party device
    driver is necessary:
    Disk Manager MAC
    V.2.43 for systems 7.0.1 by OnTrack

    After successful completion, the drive will be recognized by the
    Apple system. It could happen that after a SHUTDOWN and a restart,
    the Apple system will not recognize the drive anymore. To overcome
    the problem, a RESTART (soft reboot) is necessary.

2.2 Installing the S12 as a boot drive

    Now the first drive must be removed and the 0662 settings have to
    be set to:
    - Auto Start
    - Disable Unit Attention
    - Set Active Termination
    - SCSI ID = 0

    After starting the system, insert the "Install me first" disk and
    follow the instructions, e.g.: select "Switch Disk" and select the
    hard disk.

    Now the 0662 will work as the boot drive.

    | HP SYSTEMS |

INSTALLATION PROCEDURE for SPITFIRE Model 0662 S12

Set Autostart Jumpers to CLOSED on the drive

The drive is connected to the external SCSI bus as the last device
and addressed as target 1 and an external power supply used.

1. After system boot-up, login as root and type the following commands
   in a hpterm window: "mediainit/dev/rdsk/c201d1s0"
   (This command takes some time to complete)
   SCSI target 7 has the highest priority with the internal drive set
   to target 6.
   If the drive is set to a target address other than 1, then a differ-
   ent device file (i.e., not c201d1s0) must be used:
       e.g. "c201d2s0" for target 2
            "c201d3s0" for target 3

          etc........

2. "/etc/mkfs-L/dev/rdsk/c201dls0 1027515 108 5 8192 1024 16 10 90 2048"
   The syntax for the mfks command is:
           "-L" - allows filenames up to 255 bytes in length
        1027515 - number of DEV_BSIZE blocks in the filesystem
                  (DEV_BSIZE is defined in sys/param.h and is normally
                   1024)
            108 - sectors per track
              5 - tracks per cylinder
           8192 - block size
           1024 - fragmentation size (the minimum size a file is
                  allocated)
             16 - number of cylinders per cylinder group
             10 - minimum percentage of free disk space allowed
             90 - revolutions per second
           2048 - number of data bytes per inode slot

3. "fsck-p/dev/rdsk/c201dls0"
   (to check the newly created filesystem)

4. "mkdir/spitfire" (Mount point)

5. "mount/dev/dsk/c201dls0/spitfire"

6. To mount the drive automatically on boot edit/etc/checklist to
   include
        "/dev/dsk/c201dls0/spitfire hfs rw, suid 0 1"
   (you may need to use "chmod+w/etc/checklist" to get write permission
   on the file).

   This concludes the installation of the drive.

| SCSI PARITY |

Some older SCSI-1 systems may require disabling SCSI parity for
attachment. This is also a jumper selectable option.

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use of OEM Manufacturers attaching IBM disk drives and is believed to
be accurate but is supplied without guarantee.