D-105 DataFast™

IDE Hard Drive Software Duplicator
User's Manual

GREYSTONE

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Contents

Chapter 1: Introduction

Chapter 2: Setting Up Your D-105

Chapter 3: Startup Using Standard Jobs

Chapter 4: User-Defined Operations

Chapter 5: Smart Options

Chapter 6: Password Protection

Chapter 7: Questions & Answers

Chapter 1
Introduction

1-1 Introduction

Congratulations on your purchase of the D-105 DataFast™ IDE Hard Drive Software Duplicator from Greystone Peripherals, Inc. The D-105 disk duplicator is designed to be used as a stand-alone IDE duplication system to selectively copy program software and data from one master source drive to five target disk drives, simultaneously. Ideal for volume applications, its intelligent mode enables the custom configuration of drives, including partitioning and formatting during the duplication process. Target drives that are identical to the source drive may be "mirrored", or duplicated exactly, sector by sector. For faster copying, or for dissimilar drives using a FAT16, FAT32, NTFAT or NTFS file system, a Smart Copy mode is used.

The duplication operation of the D-105 is based on the execution of a predefined job or method. Each job setup defines the type (physical details) of the source and destination disk, selective or complete copying, and mode of copying. The operation uses a series of display screens and menus to help the user execute jobs, and set up new jobs with a minimum of keystrokes.

1-2 Smart Options

This manual also documents instructions for using the DataFast Smart Options, which are not part of the standard DataFast features. The Smart Options provide the following features and must be purchased separately.

- **DOD Wipeout Smart Option**
    - Enables target drives to be completely erased, in accordance with DoD 5220.22-M specifications.

- **Partition Smart Option**
  - The Partition Mode Smart Option can be used to choose one or more partitions from the source drive, to be duplicated to the target drives. In addition to choosing one or more partitions, the partitions can also be resized and/or reordered on the target drives. Each target drive configuration can be determined independent of the other target drives. With this option, a source drive can be constructed containing many different software loads, each of which can be duplicated individually to target drives.

- **NTFS Smart Option**
  - The NTFS Smart Option copies only the data on an NTFS partition from the source to the target drives.

- **Database Smart Option**
  - The Database Smart Option records process information in a delimited file for importation into many popular database applications.

To purchase any of the Smart Options, please call Greystone Peripherals at **(408) 866-4739**. You will be given a password key to unlock the purchased option for immediate use.

1-3 Specifications

- Maximum number of target drives: 5
- Maximum number of source or target partitions: 10
- File systems supported by **Smart Copy**: FAT12, FAT16, VFAT (Windows 95), FAT32, NTFAT and NTFS

1-4 Features

- Duplicates software from a master disk drive to up to five target disk drives simultaneously
- Supports Ultra DMA ATA/EIDE/IDE drives, including all 2.5" notebook drives
- Data transfer speeds over 10 MB/sec.
- Copies all operating systems
- Smart Copy mode (and *NTFS Smart Option*) duplicates only files, not unused space or deleted files (all FAT file systems)
- Adjust size and number of partitions (up to 10) on each target drive (with *Partition Copy Smart Option*)
- Mirror mode copies even unknown file systems to drives with identical cylinder, head and sector counts
- Copies Compaq and Winbook maintenance partitions
- Duplicates drives larger than 8 GB
- Supports LBA, CHS addressing and Read/Write Multiple modes
- Automatic parameter translation option to keep logical cylinder count below 1024
- Multiple source and target partitions supported. Copy from any source partition to any target partition (with *Partition Copy Smart Option*)
- Wipeout mode fills each sector on disk with zeroes, or a user-specified pattern
- Empty partitions may be defined, or partitions may be formatted without copying any data (with *Partition Copy Smart Option*)
- Verify option reads back copied data and compares with original
- Data logging tracks job results (with *Database Smart Option*)

- Visual and audio signals for completion of operation and error alerts
- Compact size for portability

1-5 Complete System Configuration

- DataFast D-105 Unit
  - One serial port
  - One parallel printer port
  - One 3 ½" floppy drive
  - Six power cables
  - Six 40-pin data interface cables for connecting master and target 5 ¼" and 3 ½" drives
  - Six 44-pin data interface cables for connecting master and target Notebook drives
- Software diskette
- Monitor
- Keyboard
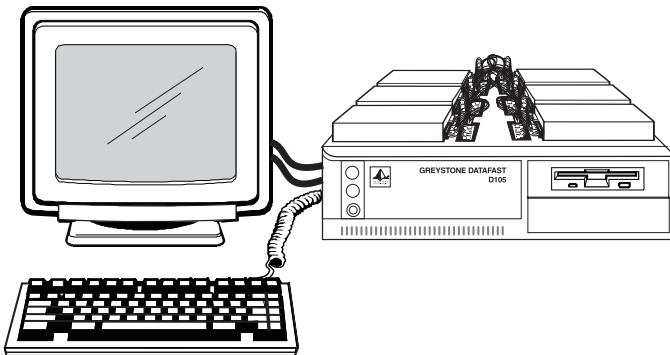
D-105 DataFast System

Chapter 2
Setting Up Your D-105

This chapter will guide you through the easy procedures for setting up your D-105 disk duplicator system. It includes the following sections:

- Unpacking your D-105
- Setting up the system for operation

Once you have completed the setup procedures detailed in this chapter, refer to Chapter 3 for operating instructions to get you up and running quickly.

2-1 Unpacking Your D-105

Before setting up the D-105, verify that you have received all the items for the system configuration you ordered. Please consult your dealer or Greystone Peripherals if any item is damaged or missing.

D-105 Basic System:

1. One D-105 unit
2. Six power cable connectors
3. Six 40-pin data ribbon cables for 5 1/4" and 3 1/2" drives
4. Six 44-pin data ribbon cables for Notebook drives
5. One AC power cord
6. One IDE DataFast (D-105) 3½" diskette
7. Registration card
8. User's manual

D-105 Complete System:

A complete system should include all the items listed for the Basic System (as itemized above), plus:

9. One monitor (monochrome or color)
10. Mini keyboard

Record the D-105 Serial Number

Now is a good time to record the serial number and date of purchase. Locate the serial number on the unit and write it down in the space below for future reference if needed.

D-105 Serial No.: _____

Date of Purchase: _____

2-2 Setting Up Your D-105

Proceed with the following instructions for easy set up of your D-105 disk duplicating system.

IMPORTANT

Before you begin, it is highly recommended that you make at least one backup copy of the IDE DataFast D-105 program disk. Operation of your D-105 runs directly from the program floppy at all times. Therefore, it is very important that you store your master disk in a safe place and run the program from a backup copy. The backup copy disk must not be write protected.

---

1. Place the D-105 system unit on a sturdy, level location away from direct sun or heat. Make sure you have convenient access to a 115/230V AC power source.

2. Connect the keyboard by plugging it into the keyboard connector located on the back of the unit.

3. Place the monitor in a convenient location next to the D-105 unit and make the cable connections on the back of the unit.

   a. Connect the video cable to the 15-pin video connector.

   b. Connect the power cord to the power outlet.

4. Connect the unit's power cord to the power-in connector on the back of the unit. **DO NOT plug the power cord into an AC power source at this time. (Wait until Step 8.)**
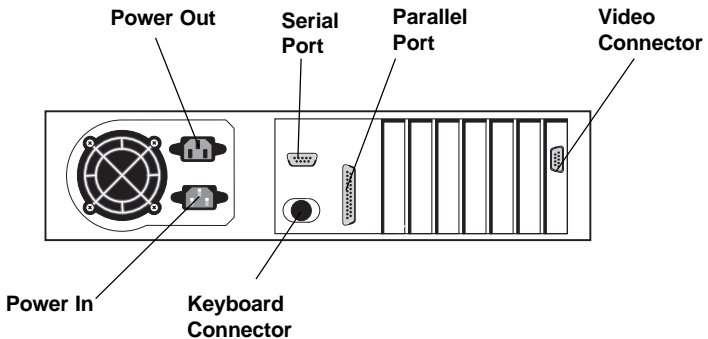
Back View of the D-105

5. Connect the drive power cables to each of the *Master* and *Target* drive locations on top of the unit. *(These will be used for the 40-pin connector for 5.25" and 3.5" drives only.)*

   Locate the six 4-wire power cables. Connect one 4-pin connector end from each power cable to the power connector at each drive connector station on top of the D-105 unit. Note that each station for connecting a drive is labeled to identify the *Master* and *Target* drives *Target 1*, *Target 2*, *Target 3*, *Target 4* and *Target 5*. The connectors are keyed for proper insertion.

6. Connect the data interface ribbon cables to each of the *Master* and *Target* drive locations on top of the unit. Two types of connectors are provided for connecting a target drive: 40-pin for standard 5.25" and 3.5" drives and 44-pin for smaller 2.5" notebook drives.

   a. Connect one end of each 40-pin data ribbon cable to the 40-pin connector mounted on top of the D-105 unit for each drive location.

b.   Connect one end of each 44-pin data ribbon cable to the 44-pin connector mounted on top of the D-105 unit for each drive location.

Note that the connectors are keyed for proper insertion.

Power Connector for 5.25" and 3.5" drives

44-Pin Connector (For 2.5" drives)

40-Pin Connector (For 5.25" and 3.5" drives)
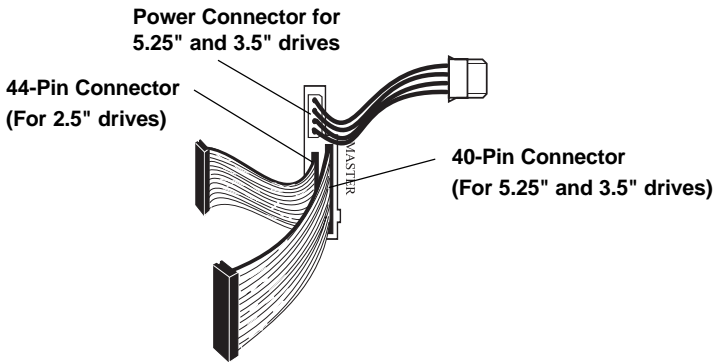
Connector Locations for Setting Up Each Master/Target Drive

7. Place the *Master* and up to five *Target* hard drives on the anti-conductive pad on the top of the D-105 unit. Facing the D-105 unit, position the hard drives next to the connector assemblies as follows. (Note the positions labeled on top of the unit).
   a.   *Master* drive at the left, rear position
   b.   *Target 1* drive at the left, middle position
   c.   *Target 2* at the left, front position
   d.   *Target 3* drive at the right, rear position
   e.   *Target 4* at the right, middle position
   f.   *Target 5* drive at the right, front position

SPECIAL NOTE

All drives, both *master* and *target* drives must be set (following the drive manufacturer's instructions) as MASTER DRIVES. They must not be set as slave drives, or set to cable select.

8. Plug in the unit's power cord into an AC power source. (Note that the power supply will automatically detect and switch to the correct 115/230V voltage source when the unit is powered on.)
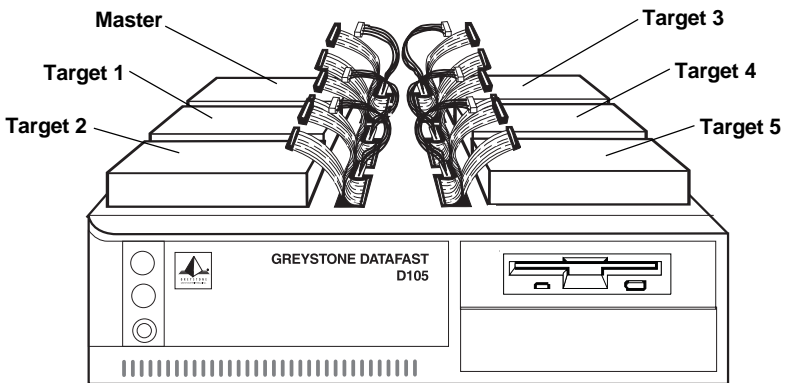
D-105 with Drives in Position

The D-105 unit is now ready for operation. Continue to *Chapter 3* to complete the cable connections and begin disk duplicating.

Chapter 3
Startup Using Standard Jobs

This chapter will guide you through the quick and easy operation of your D-105 disk duplicator system using the "Greystone Standard Jobs" screen. The menu screen options presented in this chapter describe the functions available for the majority of your copying needs. These screens are factory set for safe, automatic execution; you cannot change any of the job settings. As you become more familiar with the D-105's functions, you will find that there are many features that can be accessed through user-defined jobs, where you can create your own jobs that can be saved. Refer to Chapter 4 for information regarding the user-defined options.

Please note that the terms "source" and "master" are used interchangeably throughout this document.

3-1 Startup

Proceed with the following steps after completing the initial hardware setup outlined in *Chapter 2*.

1. Turn the monitor ON.

2. Insert the 3 ½" IDE DataFast (D-105) program disk in the floppy drive. Make sure the disk is NOT write protected.

3. Turn the D-105 unit ON to boot from the floppy disk to load the program software.

4. Once completed, the program will continue to boot, display a "Greystone Peripherals" greeting screen, and then open to the main "Greystone Standard Jobs" menu screen.

Main "Greystone Standard Jobs" screen:

```
              Greystone D-105 software version 5.11
    Press <F1> to execute job immediately, <Enter> to review job setup.
  <Tab> to select list of user defined jobs, <F2> to copy job to user list.
                  Press <Alt-F4> to exit program.

Greystone Standard Jobs:
   Smart Copy
   Mirror Copy
   Test Disk
   DOD Wipeout

Fri, 29 Jan 1999                                      08:36:57 AM    ●
Status: Select job using cursor keys to browse list.   Cable Select On
```
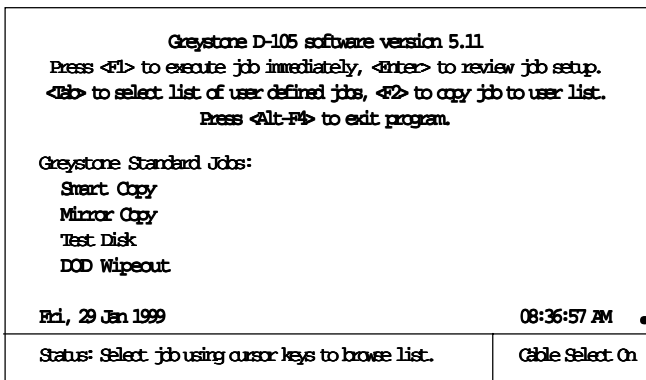
5. Connect the drives to the system when the above "Greystone Standard Jobs" screen is displayed.

   a. Plug in each power cable connector from the D-105 unit to the appropriate *Master* or *Target* drive. It is VERY IMPORTANT that the correct cable is connected to each drive (*Master* to *Master*, *Target 1* to *Target 1*, etc.)

   b. Connect the appropriate data ribbon cable (40- or 44-pin) from the D-105 unit to each *Master* and *Target* drive. It is VERY IMPORTANT that the correct cable is connected to each drive. (*Master* to *Master*, *Target 1* to *Target 1*, etc.)

   MAKE SURE PIN 1 ON THE CABLES AND DRIVE MATCH WHEN MAKING THE CONNECTIONS.
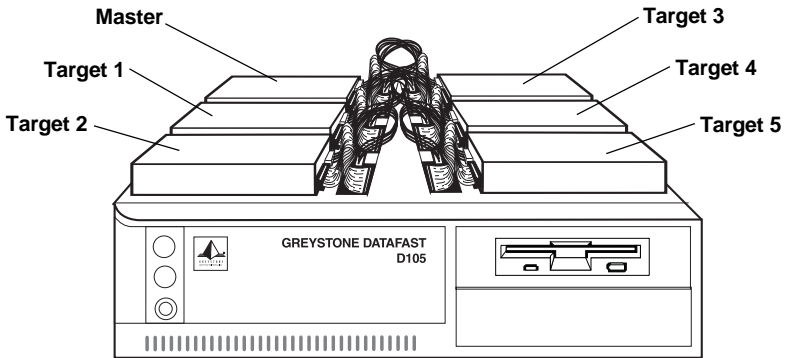
Master/Target Drives with Cable Connections

The drives are now ready for the job operation you choose to perform. The drive power will remain OFF until a job is started.

3-2 Standard Jobs Operations

Once the drives are connected, you have the choice of job operations to perform from the main "Greystone Standard Jobs" menu. The following key commands are used to navigate through the program.

- Use the **<arrow>** cursor keys to highlight your selection.
- Press **<F1>** to run job.
- Press **<Enter>** to view the job setup.
- Press **<Esc>** once to stop an operation or go back to previous menu screen.
- Press **<Alt><F4>** to exit the program when no operation is in progress.
- Type **GO** at the A:\ DOS prompt to restart the program after exiting the program. It will also report any errors it encounters as it loads.

The basic rules for using **Smart Copy** or **Mirror Copy** modes:

- If you have dissimilar drives (*different* makes, models, cylinders, head and sectors), or if the file system is FAT12, FAT16, FAT32, VFAT, NTFAT or NTFS, select the **Smart Copy** mode to invoke the disk duplicating process from the master to the connected target drive(s).
- If all drives are of the same manufacturer and model, with the *same* cylinders, heads and sectors, select **Mirror Copy** mode, or **Smart Copy** mode.

3-2.1 Greystone Standard Jobs: Screen

```
              Greystone D-105 software version 5.11
     Press <F1> to execute job immediately  <Enter> to review job setup.
     <Tab> to select list of user defined jobs  <F2> to copy job to user list.
              Press <Alt-F4> to exit program.

Greystone Standard Jobs:
    Smart Copy
    Mirror Copy
    Test Disk
    DOD Wipeout

Fri, 29 Jan 1999                                    08:36:57 AM      ●
Status: Select job using cursor keys to browse list.    Cable Select On
```
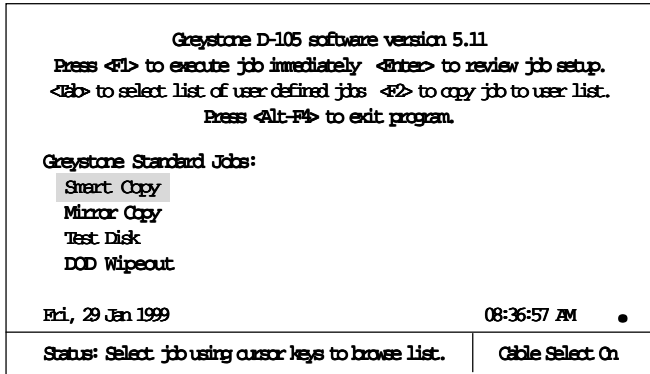
The following sections describe the jobs you can run from the main "Standard Jobs" menu for auto-processing. The example screens provided in **Smart Copy** mode are common to all the Standard Jobs options when you execute the <**Enter**> and <**F1**> key commands. You can also view other option screens (invoked by the key commands identified at the top of each screen) to view the default settings. ***Remember that when using the default "Greystone Standard Jobs" operations, the settings are automatically set by the program and cannot be changed.***

Smart Copy

This mode copies the entire source master drive to designated targets, keeping the basic source's partition structure intact. If the file system of a source partition is unknown and the source and target drives have matching heads and sector/track configuration, the target partition size will be set equal to the source partition, and the contents will be "partition mirror" copied. If the file system is known (with FAT12, FAT16, FAT32, NTFAT, or NTFS), the target partition size will be automatically adjusted, based on the ratio of the capacity of the source drive to the capacity of the target drive. Data will be copied file-by-file, adjusting target FAT size, and cluster size as needed.

Smart Copy - Standby Screen
Command key: <Enter>

Highlight the **Smart Copy** mode option and press **<Enter>** to view the standby/drive status screen.

```
                          Smart Copy

        <F1> Start copy <F7> Edit CHS trans. <F10> = Set system options
                 <Enter> = Edit copy options for selected target
     <V> Verify previous copy <Delete>  = Disable target position <F9> = View data

     Source Drive                      Capacity Status
       WDC AC3400L                        3815 Drive ready
     Target Drives
         1 QUANTUM FIREBALL_TM3840A       3682 Drive ready
         2 FUJITSU M1638TAU               2452 Drive ready
         3 ST5 1080A                      1034 Drive ready
         4 IBM-DAQA-32160                 2014 Drive ready
         5 QUANTUM FIREBALL ST6.4 A       6150 Drive ready

     Fri, 29 Jan 1999                              08:36:57 AM    .

     Status: Idle                                  Cable Select: On
```

Before executing **Smart Copy**, you can view the settings the program has automatically allocated for the master and target drive partitions.

Master drive partition details
Command key: <Enter>

To view the master drive's configuration, while in the job standby screen, use the arrow keys to highlight-select the source drive and press **<Enter>**. The following identifies the drive description and partition status.

```
                          Smart Copy
         <Esc> = Return to main screen, , <F10> = Set system options

        Source Model Number:  WDC AC34000L
              Serial Number:  WD-WT3510266621
              Firmware Rev:   24.39E26            Cylinders:  7752
         Megabyte Capacity:   3815                   Heads:  16
              Total Sectors:  781416          Sectors/Track:  63
     R/W Multi: 16  LBA mode: Yes             ATA PIO Mode:  4

     Source Drive partitions        Cluster usage:
       Size    Type    System     Size Highest #  Used  /  Total
     1  2016   HUGE    MSWIN4.1   [64]     12601   9268    64512   ( 14% )
     2  1795   HUGE    MSDOS5.0   [64]         1      2    57600   (  0% )

     Fri, 29 Jan 1999                              08:36:57 AM    .

     Status: Drive ready                           Cable Select: On
```

Press **<Esc>** to go back to the Smart Copy job standby screen.

Target drive partition details
Command Key: <Enter>

To view a target drive's setup parameters, while in the job standby screen, use the arrow keys to highlight select the target drive you want to check and press <**Enter**>. The following screen identifies the drive description and allocated partition status.

```
                        Smart Copy
            <Esc> = Return to main screen    <F10> = Set system options

  <F7> = Edit CHS translation parameters  <F8>=Copy traget setup to other targets
       Target 1 Model Number:  QUANTUM FIREBALL_TM3840A
               Serial Number:  396621616730
                Firmware Rev:  A6B.2000        Cylinders:  7480
           Megabyte Capacity:  3682                Heads:  16
               Total Sectors:  7539840     Sectors/Track:  63
      R/W Multi: 16  LBA mode: Yes        ATA PIO Mode:  4

  Source Drive partitions       Target Partition Setup:   Disk Mode: Smart
      Size   Type   System              Size
   1  2016   HUGE   MSWIN4.1    1 ->    1945   Smart Copy
   2  1795   HUGE   MSDOS5.0    2 ->    1732   Smart Copy
  Fri, 29 Jan 1999                                     08:36:57 AM  .
  Status: Press <space> to change disk mode             Cable Select On
```

Press <**Esc**> to go back to the job standby screen.

Run Smart Copy
Command key: <F1>

Press <**F1**> to automatically execute the **Smart Copy** operation. The source/target drives, and files names as they are being copied are displayed.

```
                        Smart Copy
                   Common PIO mode = 4
                Common R/W multiple block size = 16
  Source Drive                    Capacity Status
    WDC AC3400L                     7340 1:  < file name >
  Target Drives
    1 QUANTUM FIREBALL_TM3840A     7340  46%  [    ] ——
    2 FUJITSU M1638TAU            2452  46%  [    ] ——
    3 ST5 1080A                   1034  46%  [    ] ——
    4 IBM-DAQA-32160              2014  46%  [    ] ——
    5 QUANTUM FIREBALL ST6.4 A    6150  46%  [    ] ——
  Fri, 29 Jan 1999                                     08:36:57 AM  .
  Status: Duplicating                                   Cable Select On
```

The following sequence of "end of copying" screens will be displayed after processing is complete, prompting you when the drives are safe to remove.

```
                        Smart Copy

   <F1> Start copy <F7> Edit CHS trans. <F10> = Set system options
            <Enter> = Edit copy options for selected target
            <V> Verify previous copy <Insert>  = Enable target

Source Drive                         Capacity Status
   WDC AC3400L                         7340   7248 Files
Target Drives
   1 QUANTUM FIREBALL_TM3840A          7340   100%
   2 FUJITSU M1638TAU                  7340   100%
   3 ST5 1080A                         7340   100%
   4 IBM-DAQA-32160                    7340   100%
   5 QUANTUM FIREBALL ST6.4 A          7340   100%

     ┌────────────────────────────────────────────────────┐
     │  Shutting down drive power, please wait a moment.    │
     └────────────────────────────────────────────────────┘

Fri, 29 Jan 1999                              08:36:57 AM   .
────────────────────────────────────────────────────────────
Status: Duplicating                      | Cable Select On
```

```
                        Smart Copy

   <F1> Start copy <F7> Edit CHS trans. <F10> = Set system options
            <Enter> = Edit copy options for selected target
            <V> Verify previous copy <Insert>  = Enable target

Source Drive                         Capacity Status
   WDC AC3400L                         7340   7248 Files
Target Drives
   1 QUANTUM FIREBALL_TM3840A          7340   100%
   2 FUJITSU M1638TAU                  7340   100%
   3 ST5 1080A                         7340   100%
   4 IBM-DAQA-32160                    7340   100%
   5 QUANTUM FIREBALL ST6.4 A          7340   100%

     ┌────────────────────────────────────────────────────┐
     │  Waiting for drives to come to a Complete Stop.      │
     └────────────────────────────────────────────────────┘

Fri, 29 Jan 1999                              08:36:57 AM   .
────────────────────────────────────────────────────────────
Status: Duplicating                      | Cable Select On
```

```
                        Smart  Copy

                         Job Results:
        Target 1:     Operation complete.  229 MB copied
        Target 2:     Operation complete.  228 MB copied.
        Target 3:     Operation complete.  229 MB copied
        Target 4:     Operation complete.  228 MB copied.
        Target 5:     Operation complete.  229 MB copied
                     Elapsed time = 3:49
              Press <Esc> to return to job select screen

         ┌──────────────────────────────────────────────┐
         │          Safe to remove Drives Now.          │
         └──────────────────────────────────────────────┘

     Fri, 29 Jan 1999                          08:36:57 AM   .
 ┌──────────────────────────────────────────────┬──────────────┐
 │ Status: Operation complete - press target number for detail │ Cable Select On │
 └──────────────────────────────────────────────┴──────────────┘
```

Mirror Copy

The disk **Mirror Copy** mode is valid only for target drives which have the same number of cylinders, heads and sectors per track as the source drive. For Mirror Copy mode, the maximum number of megabytes to be copied must be defined. To duplicate identical drives, zero (0) for the back megabytes, and 65535 (maximum) for the front megabytes is normally set. This ensures that the entire drive is copied sector for sector.

Highlight the **Mirror Copy** option and press **<Enter>** to view the drive status.

Press **<F1>** to automatically execute the **Mirror Copy** operation. The source, target drives and percent copied is displayed.

A final "Job Results" screen will be presented after the process is completed.

Test Disk

Selecting the "**Test disk**" option enables you to test the capacity of the drive you specify. This mode will read blocks of data from the selected target drive, save the data in RAM, write a test pattern to the same area of the target disk, read back and verify the test pattern, write the original data back to the disk, and verify that the original data was written back correctly. If any errors occur, the process will be stopped and the errors reported. The test process will be repeated for successive blocks on the disk. The front MB and back MB fields will specify what portion of the disk will be tested in this manner. The default values are set to test the full disk: Front MB = 65535 and Back MB = 0. If you only want to test a portion of the drive, you can specify different begin and end parameters to test.

DOD Wipeout

This is a Smart Option. Please refer to *Chapter 5*, page 5-11.

Chapter 4
User-Defined Operations

One of the great features of the D-105 DataFast is that it allows you to create and save user-defined jobs. This chapter will describe the different user-defined options that are available to you when setting up custom disk operations. No changes can be made to the source (master) drive, but you can selectively control (and save) the job operations you wish to run on the target drives.

The following flow diagram provides a basic overview of the program's scheme and key commands.

Boot from the program disk or type <u>GO</u> at the DOS prompt

Other Command Options:
<F1> Execute a job
<F2> Create new job
<F3> Edit name of user-job
<F4> Save job
<F5> Smart Options
<F6> Set Password
<F7> Edit CHS Translation
<F9> View Data Screen
<F10> Set System Options
<Alt><F4> Exit Program
<Ins>/<del> Enable/disable target

Greystone Standard Jobs Screen **<Tab>** **User Defined Jobs: Screen**

<Enter>

Standby Master/Targets Drive Status Screen

NOTE: From the Greystone Standard Jobs screen, there are NO user-definable options in the detail screen.

Use **arrow** keys to select Master/Target1/Target2

Press **< Enter>** key to select detail screen

User-Defined Options For Target Drive Setup

Details of selected Master/Target Drive

Disk Mode:
Smart
Partition (SO)
Clear Disk
Test Disk
Mirror
DOD Wipeout (SO)

MBs
Front
Back

Partition Copy Smart Option

Add/Delete Target Partitions

Partition Copy Mode
Smart
Format only
Blank
Mirror

Target Partition(s) Size

Link/Unlink
Master-to-Target Partitions

Note: SO = Smart Option

The following sections describe the user-defined options available to you.

4-1 User-Defined Jobs:
Command key: <Tab>

When you first boot the D-105 (using the program disk), the program will open to the main Greystone Standard Jobs screen. You have the choice of pressing **<F1>** to automatically run one of the selected job options, pressing **<Enter>** to view the default auto-set parameter screens before running a job, or pressing the **<Tab>** key to enter the user-defined job menus. (You can also press **<Tab>** again at any time to go back to the Greystone Standard Jobs mode.)

Note that the information at the top of all screens shows the command key functions that are available to you from that screen.

"Greystone Standard Jobs" screen after bootup:

```
                    Greystone D-105 software version 5.11
        Press <F1> to execute job immediately, <Enter> to review job setup.
       <Tab> to select list of user defined jobs, <F2> to copy job to user list.
                        Press <Alt-F4> to exit program.

    Greystone Standard Jobs:
        Smart Copy
        Mirror Copy
        Test Disk
        DOD Wipeout


    Fri, 29 Jan 1999                                       08:36:57 AM    ●
    Status: Select  job - use or keys to browse list.          Cable Select On
```

Press the **<Tab>** key to advance to the user-defined jobs screen. Below is the User Defined Jobs screen after pressing **<Tab>**:

```
                    Greystone D-105 software version 5.11
        Press <F1> to execute job immediately, <Enter> to review job setup.
       <F2> create new job  <F3> Edit job description  <Tab> = Standard jobs
                        Press <Alt-F4> to exit program

    User Defined jobs:
        Default User Defined Job

    Fri, 29 Jan 1999                                       08:36:57 AM    ●
    Status: Select job using cursor keys to browse list.       Cable Select On
```

You will see one highlighted default job called "Default User Defined Job". Press the <**Enter**> key.

4-1.1 Default User Defined Job
Command key: <Enter>

```
                    Default User Defined Job

       <F1> Start copy, <F7> Edit CHS trans. <F10> = Set system options
                <Enter> Edit copy options for selected target
 <V> = Verify previous copy  <Delete> = Disable target position  <F9> = View data
  Source Drive                              Capacity Status
    WDC AC3400L                               3815  Drive ready
  Target Drives
   1 QUANTUM  FIREBALL_TM3840A          3682 Drive ready
   2 FUJITSU M1638TAU                   2452 Drive ready
   3 ST5 1080A                          1034 Drive ready
   4 IBM-DAQA-32160                     2014 Drive ready
   5 QUANTUM FIREBALL ST6.4 A           6150 Drive ready

   Fri, 29 Jan 1999                             08:36:57 AM   ●
  Status: Idle                                       Cable Select On
```

This presents the standby drive status menu screen. From this screen you can view the details of any of the drives by using the cursor arrow keys to highlight-select the drive you want to view or change, then press <**Enter**>. The following screen example shows the details of the *source* drive with partition information. No changes can be made to the source drive's parameters.

```
                    Default User Defined Job
         <ESC> = Return to main screen, , <F10> = Set system options

   Source   Model Number: WDC AC3400L
               Serial Number:  WD-WT3510266621
              Firmware Rev: 24.39E26          Cylinders:  7752
         Megabyte Capacity: 3815                  Heads:  16
              Total Sectors: 7814016       Sectors/Track:  63
   R/W Multi: 16  LBA mode: Yes           ATA PIO Mode:  4

   Source Drive partitions      Cluster usage:
     Size  Type   System     Size Highest #  Used  /  Total
   1 2016  HUGE  MSWIN4.1  [64]   12601  9268    64512  ( 14%)
   2 1795  HUGE  MSDOS5.0  [64]       1     2    57600  (  0%)

   Fri, 29 Jan 1999                             08:36:57 AM   ●
  Status: Drive ready                               Cable Select On
```

Number of sectors per cluster   Highest cluster number used   Total clusters used   Total clusters

The following screen shows the details of the *Target 1* drive.

```
                    Default User Defined Job

  <Esc> = Return to main screen, , <F10> = Set system options
           <Insert> target partition <Delete> target partition
 <F7> = Edit CHS translation parameters <F8>Copy target setup to other targets


    Target 1 Model Number:  QUANTUM FIREBALL_TM3840A
           Serial Number:  396621616730
           Firmware Rev:  A6B.2000        Cylinders:  7480
      Megabyte Capacity:  3682              Heads:  16
          Total Sectors:  7539840      Sectors/Track:  63
 R/W Multi: 16  LBA mode:  Yes        ATA PIO Mode:  4

 Source Drive partitions    Target Partition Setup:   Disk Mode: Partition

    Size   Type   System              Size   Copy mode
 1  2016   HUGE   MSWIN4.1        1   2016=Smart Copy
 2  1795   HUGE   MSDOS5.0        2   1662=Smart Copy

   Fri, 29 Jan 1999                            08:36:57 AM   ●
  Status: Select  job - use or keys to browse list.        Cable Select On
```

The user can define the copy method to use for the target detail screen. The method to use may be selected using the **<Spacebar>** to cycle through the Disk Mode options. (Note that the screen options will change with each mode change.)

Partition
DOD Wipeout ⎤ *These are Smart Options*

Smart
Test Disk
Mirror ⎤ *These are normal options*
Clear Disk

Disk Mode: Smart

Selecting the Disk Mode "**Smart** " option will display the drive and source/target partition information. This mode copies the entire source drive to designated targets, keeping the basic source partition structure intact. *If the file system of a source partition is unknown and the source and target drives have matching heads and sector/track configuration, the target partition size will be set equal to the source partition, and the contents will be "partition mirror" copied.* If the file system is known, the target partition size will be automatically adjusted based on the ratio of the capacity of the source drive to the capacity of the target drive. Data will be copied file-by-file, while adjusting target FAT type, FAT size, and cluster size as needed.

No changes can be made using this mode.

```
                       Default User Defined Job

         <Esc> = Return to main screen, , <F10> = Set system options
                        <Insert> target partition
                    <F7> = Edit CHS translation parameters
           Target 1 Model Number:  QUANTUM FIREBALL_TM3840A
                   Serial Number:  396621616730
                   Firmware Rev:  A6B.2000         Cylinders:  7480
               Megabyte Capacity:  3682              Heads:  16
                   Total Sectors:  7539840    Sectors/Track:  63
         R/W Multi: 16    LBA mode: Yes              PIO Mode:  4

         Source Drive partitions     Target Partition Setup:   Disk Mode: Smart
            Size    Type    System            Size    Copy mode
         1  2016    HUGE    MSWIN4.1          1945   Smart Copy
         2  1795    HUGE    MSDOS5.0          1732   Smart Copy

         Fri, 29 Jan 1999                                    08:36:57AM   .

         Status: Press <space> to change disk mode          Cable Select On
```

Disk Mode: Test disk

Selecting the "**Test disk**" option enables you to test the capacity of the drive you specify. This mode will read blocks of data from the selected target drive, save the data in RAM, write a test pattern to the same area of the target disk, read back and verify the test pattern, write the original data back to the disk, and verify that the original data was written back correctly. If any errors occur, the process will be stopped and the errors reported. The test process will be repeated for successive blocks on the disk. The front MB and back MB fields will specify what portion of the disk will be tested in this manner. The default values are set to test the full disk: Front MB = 65535 and Back MB = 0. If you only want to test a portion of the drive, you can specify different begin and end parameters to test.

```
                      Default User Defined Job

   <Esc> = Return to main screen, , <F10> = Set system options
                      <Insert> target partition
                 <F7> = Edit CHS translation parameters
      Target 1 Model Number:  QUANTUM FIREBALL_TM3840A
               Serial Number:  396621616730
               Firmware Rev:  A6B.2000          Cylinders:  7480
          Megabyte Capacity:  3682                  Heads:  16
               Total Sectors:  7539840      Sectors/Track:  63
   R/W Multi: 16    LBA mode:  Yes              PIO Mode:  4

   Source Drive partitions     Target Partition Setup:    Disk Mode: Test disk
      Size   Type    System                 Front MB    Back MB
   1  2016   HUGE    MSWIN4.1                  6555        0
   2  1795   HUGE    MSDOS5.0

   Fri, 29 Jan 1999                                      08:36:57 AM   .

   Status: Press <space> to change disk mode          Cable Select On
```

Disk Mode: Mirror

This mode is valid only for target drives which have the same number of heads and sectors per track as the source drive. You may specify front and back megabytes, which set the amount of data copied from the front of the drive (starting with the logical sector 0), and from the back of the drive (ending with the highest logical sector). If the total number of megabytes exceeds the capacity of either the source or target drive, the entire drive will be duplicated. Normally, to duplicate identical drives, you would enter zero for the back megabytes and 65535 (maximum) for the front. This would ensure that the entire drive is copied sector for sector.

```
                    Default User Defined Job

   <Esc> = Return to main screen, , <F10> = Set system options
                    <Insert> target partition
               <F7> = Edit CHS translation parameters
     Target 1 Model Number:  QUANTUM FIREBALL_TM3840A
             Serial Number:  396621616730
             Firmware Rev:  A6B.2000        Cylinders:  7480
         Megabyte Capacity:  3682              Heads:  16
            Total Sectors:  7539840     Sectors/Track:  63
  R/W Multi: 16    LBA mode:  Yes           PIO Mode:  4

  Source Drive partitions    Target Partition Setup:   Disk Mode: Mirror
     Size   Type    System               Front MB   Back MB
  1  2016   HUGE    MSWIN4.1               6555         0
  2  1795   HUGE    MSDOS5.0

  Fri, 29 Jan 1999                               08:36:57AM   .
  Status: Press <space> to change disk mode         Cable Select On
```

Disk Mode: Clear Disk

Selecting the "**Clear Disk**" option enables you to allocate the area of the drive you want to be erased. The default values are set for the full disk: Front MB = 65535 and Back MB = 0. If you only want a portion of it erased, you can specify different begin and end parameters. Clear Disk will write 0's, or a user-specified pattern to all the selected sectors on the target drive.

```
                    Default User Defined Job

        <Esc> = Return to main screen, , <F10> = Set system options
                    <Insert> target partition
             <F7> = Edit CHS translation parameters
     Target 1 Model Number:  QUANTUM FIREBALL_TM3840A
             Serial Number:  396621616730
            Firmware Rev:  A6B.2000         Cylinders:  7480
       Megabyte Capacity:  3682               Heads:  16
           Total Sectors:  7539840    Sectors/Track:  63
  R/W Multi: 16    LBA mode:  Yes          PIO Mode:  4

  Source Drive partitions     Target Partition Setup:   Disk Mode: Clear Disk
     Size   Type   System              Front MB    Back MB
  1  2016   HUGE   MSWIN4.1               6565         0
  2  1795   HUGE   MSDOS5.0

  Fri, 29 Jan 1999                                  08:36:57 AM   .
  Status: Press <space> to change disk mode          Cable Select On
```

Disk Mode: Partition

This is a Smart Option. Please refer to *Chapter 5*, page 5-7.

Disk Mode: Wipeout

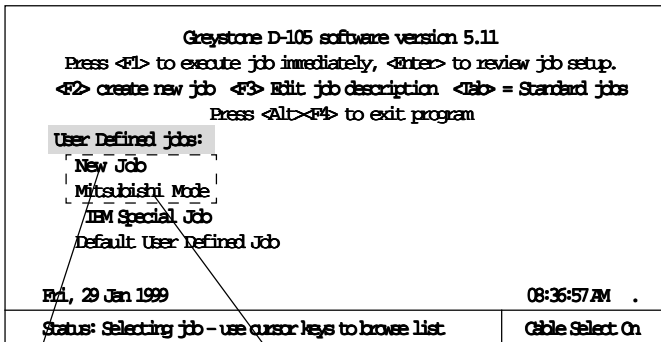This is a Smart Option. Please refer to *Chapter 5*, page 5-11.

4-2 Other User-Defined Settings

At the top of each screen you will see certain options that can be viewed when a certain function command key is pressed. This section will describe these options.

4-2.1 Create a New Job
Command key: <F2>

To create a new user-defined job, press <**F2**>. A new job will be created and added to the top of the User Defined Jobs: list screen. You may enter a descriptive job name at this point, or press <**Esc**> to keep the default name. After typing a new filename, press <**Enter**> to save the name and then press <**Enter**> again to edit the new job setup.

```
┌────────────────────────────────────────────────────────────┐
│            Greystone D-105 software version 5.11             │
│   Press <F1> to execute job immediately, <Enter> to review job setup. │
│  <F2> create new job  <F3> Edit job description  <Tab> = Standard jobs │
│                Press <Alt><F4> to exit program               │
│  User Defined jobs:                                          │
│   ┌ New Job ──────────────────┐                              │
│   │ Mitsubishi Mode          │                              │
│   │ IBM Special Job          │                              │
│    Default User Defined Job                                 │
│                                                              │
│  Fri, 29 Jan 1999                           08:36:57 AM   .  │
│ ─────────────────────────────────────────────┬────────────  │
│  Status: Selecting job – use cursor keys to browse list │ Cable Select On │
└────────────────────────────────────────────────────────────┘
```

New job added   **Other user-defined jobs**

4-2.2 Edit User Defined Job Name
Command key: <F3>

You can edit the name description of jobs in the User Defined Jobs: list (see above screen). To edit, highlight a current job description, and press <**F3**>. You may then change the description and press <**Enter**> to save the new description, or press <**Esc**> to cancel any edits and restore the previous description.

4-2.3 Edit CHS Translation
Command key: <F7>

You can edit the cylinders, heads, and sectors/tracks translation settings by pressing <**F7**>. The purpose is to allow FAT16 to address drive larger than 504MB. The maximum values that can be set are 64 heads, 63 sectors/track and 1024 cylinders. This option can be tricky to set, so it is recommended that you always use the "**Automatic**" setting. However, there are three options available. Use the <**Spacebar**> to select the option.

None　　　　No translation is performed. Drives with more than 1023 cylinders will use LBA (Logical Block Address) mode in the partition sector.

Automatic　Automatic translation will halve the cylinder count and double the head count until the number of cylinders is less than or equal to 1023. This is the recommended default setting.

Manual　　　The number of heads and sectors per track may be specified directly and the drive will be instructed to reset its internal translation parameters to these values.

```
                   Default User Defined Job

  Target 1 translation parameters

  <ESC> = Edit

                    Translation mode:    Automatic

                       Native              Translated
     Heads:              16                  128
     Sectors/track:      63                  63
     Cylinders:          7480                935

     Capacity:          3683 MB             3682 MB

   Fri, 29 Jan 1999                              08:36:57 AM   .
  Status: Press <space> to change translation mode   | Cable Select On
```

4-2.4 View Data
Command key: <F9>

The following lists the function of the keys you can use to view drive data from the <F9> standby screen:

PageDown	Move ½ sector towards end of disk
PageUp	Move ½ sector towards front of disk (sector 0)
<F11>	Cycles through sector smart display modes
+	Move one sector towards end of disk
-	Move one sector towards front of disk (sector 0)
Up Arrow	Move cursor to LBA sector input field
Down Arrow	Move cursor to CHS cylinder input field
Left Arrow	Move cursor to the left in the LBA/CHS input fields
Right Arrow	Move cursor to the right in the LBA/CHS input fields
Enter	Accept LBA/CHS user input
Alt-F	Enter in search string
Alt-G	Search for string starting at current sector
F3	Search for string starting at current sector
F7	Save current sector to disk
Tab	Show same sector on next disk
Shift-tab	Show same sector on previous disk

<F9> allows you to look at the data that exists on a drive when you are in the Standby Drive Status screen. Highlight-select a drive and press **<F9>** to view the data. Only half the sector can be seen on the screen at a time, but you can save the whole sector's data to a floppy disk by pressing **<F7>**. The data will be saved to a text file with the same name as the sector number being saved.

To view a specific area of the drive, you can set the cylinder, head, sector or LBA sector locations. The LBA (Logical Block Address) runs in consecutive numbers.

The following is a partial sample of what you might expect to see for viewing the drive data when **<F9>** is pressed.

```
   Drive 1  <Alt-F1> = Edit sector                                    <ESC>=Exit
   <F11> = Display as partition table                      <F7> = Save display to file
       LBA Sector:    0
         Cylinder:    0           Head:       0        Sector:    1

  0000:  33  C0  8E  D0  BC  00  7C  FB  50  07  50  1F  FC  BE 1B  7C    X3@< -:{}-|>-|
  0010:  BF  1B  06  50  57  B9  E5  01  F3  A4  CB  BE  BE  07 B1  04    ?..PW9e.s$X>>.1.
  0020:  3B  2C  7C  09  75  15  83  C6  10  E2  F5  CD  18  8B 13  8B    8,|.u.F.bM.
  0030:  EE  83  C6  10  49  74  16  3B  2C  74  F6  BE  10  07 4E  AC    rF.It.8,tv>.N.4<.t.
  0040:  3C  00  74  FA  BB  07  00  B4  0E  CD  10  EB  F2  89 46  25    <.tz;..4M.knF$F
  0050:  3A  C4  75.......

   Fri,  29 Jan 1999                                         08:36:57 AM   .

  Status:  Displaying data
```

**Starting byte   Data byte   Data byte
number   display**

<Alt-F1> allows you to edit the sector data. Use the arrow keys to select the bytes to edit. Type in the new hexadecimal value for the edited byte. Press **<Enter>** to accept new value. When editing is complete, press **<Esc>**.

Select '**Yes**' to save changes, or '**No**" not to save and exit the edit mode, or '**Cancel**' to continue editing.

```
  Editing sector:  0
  Press <Esc> to exit

  0000:  33  C0  8E  D0  BC  00  7C  FB  50  07  50  1F  FC  BE 1B  7C    X3@< -:{}-|>-|
  0010:  BF  1B  06  50  57  B9  E5  01  F3  A4  CB  BE  BE  07 B1  04    ?..PW9e.s$X>>.1.
  0020:  3B  2C  7C  09  75  15  83  C6  10  E2  F5  CD  18  8B 13  8B    8,|.u.F.bM.
  0030:  EE  83  C6  10  49  74  16  3B  2C  74  F6  BE  10  07 4E  AC    rF.It.8,tv>.N.4<.t.
  0040:  3C  00  74  FA  BB  07  00  B4  0E  CD  10  EB  F2  89 46  25    <.tz;..4M.knF$F
  0050:  3A  C4  75.......

   Fri,  29 Jan 1999                                         08:36:57 AM   .

  Status:  Displaying data
```

                    **Data byte   Data byte
                                          display**

<F11> allows the sector data to be displayed in different ways. Press
<F11> to scroll through the following types of data display screens.

Partition Table Display Screen:

Use the arrow keys to highlight the start of a partition. Push **<Enter>** to
jump to the start of the partition. If the file system is a FAT file
system, the D-105 will automatically display the information in the
appropriate format.

```
Drive 1 <Alt-E> = Edit sector                                    <ESC> = Exit
<F11> = Display as boot sector                         <F7> = Save display to file
LBA Sector:      0
    Cylinder:    0    Head:  0    Sector: 1
Partition sector data
                        Start.                  End            LBA      LBA
#         Type  A    Cyln  Head  Sec    Cyln  Head  Sec      Start   Length
1        FAT32  *       0     1    1     933   254   63         63 15004647
2          EXT         934     0    1     934   254   63   15004710    16065
3       Unused           0     0    0       0     0    0          0        0
4       Unused           0     0    0       0     0    0          0        0

80   01   01   00   0B   FE   FF   A5   3F   00   00   00   E7   F3   E4   00
00   00   C1   A6   05   FE   FF   A6   26   F4   E4   00   C1   3E   00   00
00   00   00   00   00   00   00   00   00   00   00   00   00   00   00   00
00   00   00   00   00   00   00   00   00   00   00   00   00   00   00   00

                                        Computed link sector:          6
                                Computed LBA extended partition base:   3

Fri, 29 Jan 1999                                                08:36:57 AM  .

  Status: <Enter> to follow link, <Backspace> to go back
```

Boot Sector Display Screen:

Use the arrow keys to highlight the root directory address. Press
<Enter> to go to the root directory sector screen.

```
Drive1 <Alt-F1> = Edit sector                              <EX> = Edit
<F11> = Display as boot sector                    <F7> = Save display to file
LBA Sector:       63
      Cylinder:    0    Head:  0    Sector:  1               Boot Sector Info

BytesPer Sector:             512      SectorsPerCluster:          8
ReservedSectors:              32      NumberofFATs:               2
                                      TotalSectors:        15004647
MediaDescriptor:             F8h      SectorsPerFAT:          14625
SectorsPerTrack:              63      Heads:                    255
HiddenSectors:                63
PhysDrive:                   128      CurrentHead:                0
Signature29:                 29h      Serial_number:       306711D5
VolLabel:              NO  NAME       SystemID:               FAT32
           FAT32 Info:                ExtFlags:               0000h
FS_Version:                    0      RootDirStrtClus:            2
FSInfoSec:                     1      BkUpBootSec:                6

[Root dir. address]         29345     [Cluster 0 address]     29329

Fri, 29 Jan 1999                                        08:36:57AM  .
Status: <Enter> to follow link, <Backspace> to go back
```

Directory Sector Display Screen:

To view root directory files: Use the arrow keys to highlight the *Starting Cluster* of any data file. Press <**Enter**> to display file data, or to enter subdirectory where you can highlight the start of any data file to display the file data.

To view subdirectory files: Use the arrow keys to highlight the *directory*, press <**Enter**>, then highlight the *Starting Cluster* of any data file to display the file data. The <**Backspace**> key can be used to move back through the sectors that were previously selected.

```
Drive 1 <Alt-F1> = Edit sector                                    <ESC> = Exit
<F11> = Display as raw data                              <F7> = Save display to file
LBA Sector:        29345
    Cylinder:       31    Head: 0    Sector: 51                     Directory Info
Filename                         Start Cluster        Size
SUHLOG     DAT                          3            5166
BOOTLOG    PRV                          5           24721
BOOTLOG    PRV                         12           25054
COMMAND    COM                         19           93812
DETLOG     OLD                         42            1019
AUTOEXEC.BAT                           43             244
CDROM          (Directory)             44               0
DOS            (Directory)             53               0
CONFIG     ORG                        261              55
AUTOEXEC.ORG                          262              12
CONFIG     DOS                        264              45
CONFIG     SYS                        265             103
DETLOG     TXT                        266           71659
MSDOS      SYS                        284            1650
~MSSETUPT      (Directory)            285
                   Link Sector:     29353
Fri, 29 Jan 1999                                               03:36:57 AM   .
  Status: <Enter> to follow link, <Backspace> to go back
```

4-2.5 Set System Options
Command key: <F10>

Press <**F10**> to view the System Options screen, which allows you to set several global parameters that are common to all jobs. Use the cursor keys to select a parameter and type in a new value, or press the <**Spacebar**> to enable an option. Press the <**Alt-F10**> keys to display statistics of the total number of jobs run, total megabytes copied, etc. (since day one). Any changes may be undone by using the <**F4**> key.

```
                        System Options
                 Press <F4> to undo changes, <Esc> to exit
                 Press <Alt-F10> to display system statistics
    [   5]   Drive power-up delay (seconds)
    [   5]   Drive power-settling  time (seconds)
    [  20]   Drive command timeout (seconds)
    [   7]   Drive spindown time (seconds)

    [   X]   100% read-back verification
      [ ]    1% read-back verification
      [ ]    Quick verify with ATA Read Verify
      [ ]    50% Verificatin, read-back or Quick
                  Data logging options:
      [ ]    Log all jobs
      [ ]    Log failed jobs
      [ ]    Log details

      [ ]    Display filenames during Smart Copy
      [ ]    Read/Write Multiple Sectors
      [ ]    Enable Cable select
      [ ]    Enable LBA translation
      [ ]    Enable Interrupt 13 translation
      [ ]    Start with user jobs screen

   Fri, 29 Jan 1999                                   03:36:57AM   .

    Status: Editing system options
```

Definitions of the System Options are listed below:

Drive control options:

Drive power-up Delay
When the disk drives are powered up, a time delay is used to prevent simultaneous drive spin-up power surges from overloading the power supply. This parameter sets the time delay in seconds between each drive spin-up. (Default is 5 sec.)

Drive power-up settling time (seconds)
This is a time delay used after power is applied to allow the power to settle and the drive to come up to speed before further interrogation and recalibration of the drive. (Default is 5 sec.)

Drive command timeout
This is the time allowed for a drive to respond to a command before declaring a timeout error. If the drive does not respond within the allowed time, it has failed – indicating a problem, such as not connected. Most drives will respond in 5 seconds. (Default is 15 sec.)

Drive spindown time (seconds)
This is the time allowed for spin down after power is turned off to the drives and before the '*Safe to remove drive*' message is displayed. (Default is 7 sec.)

Data verification options:

100% read-back verification
When selected, 100% of the data on the target drives is read back and compared to the source drive after the duplication process.

1% read-back verification
When selected, 1% of the data on the target drives is read back and compared to the source drive after the duplication process.

Quick verify with ATA Read Verify
If this option is selected, an IDE Read-Verify command will be performed after duplication process is complete. Unlike the normal verify option, no data is transferred from the disk during the quick verify operation. The IDE drive does an internal check on data integrity and returns a "good" or "bad" status indication only. If the normal verify operation is ON, it will override this quick verify option.

<User % specified> Verification, read-back or Quick data logging options
When selected, the user-specified percentage of the data on the selected target drives is read back and compared to the source drive after the duplication process. The user may specify the % to be verified by using the arrow keys to highlight the percentage amount, then type in the % for verification. (Default is 50%)

Data logging options:

These options set the type of job information that you want to be saved in the LOGFILE.TXT file for future tracking. Note that the information saved in this file will loop back and copy over the oldest data when there is no more disk space.

Log all jobs
When this option is checked, all jobs will be recorded in the LOGFILE.TXT file. The following information is logged:

- Date and time
- Type of copy
- Source and target drives
- Status of copy operation
- Total MBytes copied
- Time it took to do copies
- Startup and shutdown times of the program

Logs failed jobs
When this option is checked, and the "Log all jobs" option is unchecked, only failed jobs will be recorded in the LOGFILE.TXT file. (A failed job can be a job that is halted before completion. The same information is displayed as in the "Log all jobs" option.

Log details
When this option is checked, additional information about drives is logged.

Other Option:

Display filenames during Smart Copy
This setting affects the Smart Copy job screen as a job is running. If not selected, filenames as they are being copied will NOT be displayed. Only the % of copying status will show.

Read/Write Multiple Sectors
If Read/Write Multiple errors occur during duplication, this option allows you to disable the ATA defined "Read Multiple" and "Write Multiple" functionality for drives that do not correctly support it. The duplication process will take a little longer with this option disabled.

The following is a sample printout of a portion of the LOGFILE.TXT set to print "**Log all jobs**" and "**Log all details**":

```
                                           (SAMPLE of Failed Jobs)
->Program shutdown at Fri May 23 09:01:57 1997

**Fri May 23 09:01:53 1997
  Smart Copy
Source:   TOSHIBA MK1926FCV              S/N: Z6C16264
Target  1: TOSHIBA MK1926FCV             S/N: Z6C16279
          Status: Cancelled by user
Total MB copied = 5
Elapsed time = 0:07 ( 2 failed copies)
```

```
** Fri May 23 09:01:13 1997          (SAMPLE of Good Jobs)
  Smart Copy
Source:   TOSHIBA MK1926FCV                S/N:Z6C16264
Target 1: TOSHIBA MK1926FCV                S/N:Z6C16279
          Status: Operation complete. 118 MB copied.
Target 2: TOSHIBA MK1925FCV                S/N:Z6C16281
          Status: Operation complete. 118 MB copied.
Total MB copied = 235
Elapsed time = 5:31

-> Program startup at Fri May 23 08:55:05 1997
== Log file created: Fri May 23 08:55:05 1997
```

The following is a sample printout of a portion of the LOGFILE.TXT set to print "**No details**" and "**Log failed jobs**":

```
**Fri May 23 08:53:53 1997
  Smart Copy
Total MB copied = 6
Elapsed time = 0:08 ( 2 filed copies)

-> Program startup at Fri May 23 08:52:15 1997
== Log file created: Fri May 23 08:52:15 1997
```

The following is a sample printout of a portion of the LOGFILE.TXT set to print "**Log failed jobs**" and "**Log details**":

```
** Fri May 23 06:55:03 1997
  Mirror Copy
Source:   TOSHIBA MK1926FCV              S/N:Z6C16264
Target 1: TOSHIBA MK1926FCV              S/N:Z6C16279
        Status: Bad source drive
Target 2: TOSHIBA MK1925FCV              S/N:Z6C16281
        Status: Bad source drive
Total MB copied = 199
Elapsed time = 69:33 ( 2 failed copies)

** Thu May 22 16:04:09 1997
  Smart Copy
Source:   TOSHIBA MK1926FCV              S/N:Z6C16264
Target 1: TOSHIBA MK1926FCV              S/N:Z6C16279
        Status: Bad source drive
Target 2: TOSHIBA MK1925FCV              S/N:Z6C16281
        Status: Cancelled by user
Total MB copied = 44
Elapsed time = 1:17 ( 2 failed copies)
-> Program startup at Fri May 23 08:55:05 1997
== Log file created: Fri May 23 08:55:05 1997
```

Enable Cable Select
When selected, allows all drives to use 'Cable Select' mode on the D-105.

> **NOTE:** For D-102 models, the Cable Select mode must be individually set using the hardware jumpers adjacent to the 40-pin connector for each drive. To enable Cable Select on the D-102A, place a jumper on the two pins closest to the power connector.

Enable LBA Translation
When enabled, this option will ensure the translated heads value will be a power of 2. When disabled, the translated heads value may or may not be a power of 2.

Enable Interrupt 13 Translation
When enabled, drives larger than 4GB with 16 heads will automatically have their head count reduced to 15 heads for translation purposes.

Start with user jobs screen
When selected, the program will display the user job screen on power up.

4-2.6 Enable/Disable Target Drive
Command keys: <Ins> <Del>

A target drive may be disabled (powered down) by selecting the drive in the Standby screen and pressing the <**Del**> key. This option may be used when you need to copy to fewer targets. To re-enable a disabled target (or to reinitialize a target drive that is already powered up), select the drive and press the <**Ins**> key.

```
                          Smart Mode

        <F1> Start copy, <F7> Edit CHS trans. <F10> = Set system options
                  <Enter> Edit copy options for selected target
    <V> = Verify previous copy  <Delete> = Disable target position  <F9> View data

      Source Drive                  Capacity Status
         ST51080A                     1034  Drive ready
      Target Drives
       1 QUANTUM  FIREBALL_TM3840A       3682 Drive ready
       2 FUJITSU M1638TAU               2452 Drive ready
       3 ST5 1080A                      1034 Drive ready
       4 IBM-DAQA-32160                 2014 Drive ready
       5 QUANTUM FIREBALL ST6.4 A       6150 Drive ready

   Fri, 29 Jan 1999                                 08:36:57 AM   .

   Status: Idle
```

Chapter 5
Smart Options

The *Smart Option* suite of utilities is designed to make your Datafast hard disk duplicator more productive and useful. The Smart Option utilities and their functions are listed below. (Note: the fill-in boxes are provided as a handy reference for recording the required Smart Option key number for unlocking each Smart Option purchased.)

When calling Greystone to activate a Smart option, please have the *Internal Serial Number* displayed in the "Enable Smart Options" screen <**F5**> available to give to the Greystone representative.

Wipeout Smart Option: performs the Department of Defense Sanitize operation eradicating all information from the hard disk.

Smart Option key:

Database Smart Option: records all duplication information in a database format that can be imported into many popular database programs for analysis and job tracking.

Smart Option key:

NTFS Smart Option: copies only the data on an NTFS volume, which greatly reduces the time required to duplicate disks with the Microsoft Windows NT file system.

Smart Option key:

Partition Smart Option: lets the system manager or operator select the partitions and the order of the selected partitions that can be duplicated from the source disk drive to the target disk drive.

Smart Option key:

Smart Options Information Box

Note that at the startup of your Datafast Hard Disk Duplicator, a dialogue box listing the current *enabled* and *disabled* Smart Options will be displayed.

5-1 How to Enable Smart Options

Any of the Smart Options can be "unlocked" for immediate use by ordering directly from Greystone Peripherals. Each Smart Option requires an *unlock* number key in order for it to be enabled. To place your order and obtain an *unlock* key, call

Greystone Peripherals at *(408) 866-4739,*

and ask for your sales representative, or ask for Sales, if you do not know your sales representative.

The unlock number is keyed to the *internal* serial number of the duplicator, which can be found on the bottom line of the **Key Number** entry dialogue box of the Smart Option menu. Please make a note of this internal number, plus the hardware serial number (located on sticker on the back of your duplicator) before calling Greystone.

Refer to the following steps to enable Smart Options.

1. Insert the DataFast software diskette into the floppy drive and start the DataFast duplicator.

2. Smart Options can be enabled from the **Smart Option** menu. To activate the **Smart Option** menu, press **<F5>** from the **Jobs** menu screen.

3. When the **Smart Option** menu is displayed, use the up and down arrow keys to move the cursor to the desired option to be enabled.

4. Press the **<Space bar>** to enable the selected Smart Option.

5. Record the internal serial number displayed on the bottom line of the Key Number entry box of the Smart Option screen. Also record the serial number located on the back of the duplicator.

6. Call Greystone Peripherals at (408) 866-4739 and ask for a Sales Rep to place order and obtain the correct Smart Option Key for the option you wish to enable. *Note: a fill-in box is provided on the previous page as a handy reference for you to write in the Smart Option Key number for unlocking each purchased Smart Option.*

7. Type in the Smart Option Key number in the Key Number entry dialog box of the Smart Option screen. If the key is accepted, a

check mark will appear in the box next to the selected Smart Option.

8. Press the <**Esc**> key to exit back to the Jobs menu.

5-2   Smart Options Operations

The following sections describe the Smart Options

5-2.1 NTFS Smart Option

The NTFS Smart Option performs a mirror copy of only the data on an NTFS partition, from the source to the target drives. A 2GB partition requires approximately 8 minutes to duplicate and verify in the standard NTFS Partition Mirror copy mode that is part of all Greystone IDE duplication products. The *NTFS Smart Option* will enhance the duplication process by only copying the data from the source drive to the target drives and NOT copying blank sectors. A typical 2GB partition with 500 MB of actual data will take less than 2 minutes to duplicate and verify using the NTFS Smart Option. About 6 minutes is saved with the NTFS Smart Option. Using a NTFS source drive with a data load that is 20% the size of the NTFS partition, it is possible to duplicate approximately 25 drives using the NTFS Smart Option in the same time it takes to duplicate 5 drives using the standard NTFS Partition Mirror copy.

5-2.2 Database Smart Option

The Database Smart Option records process information in a delimited file for importation into many popular database applications. The delimiter defaults to a comma, but may be any desired character, such as a tab or semi-colon.

Record types

The following is a list of database records created using the Database Smart Option.

> **Database File Creation**
> Field 1 - Record type number
> Field 2 - Blank
> Field 3 - Date
> Field 4 - Time
> Field 5 - Record description string

Session Start
    Field 1 - Record type number
    Field 2 - Last used Job Number
    Field 3 - Date
    Field 4 - Time
    Field 5 - Record description string
    Field 6 - Software version number

Session End
    Field 1 - Record type number
    Field 2 - Last used Job Number
    Field 3 - Date
    Field 4 - Time
    Field 5 - Record description string

Job Start
    Field 1 - Record type number
    Field 2 - Job Number
    Field 3 - Date
    Field 4 - Time
    Field 5 - Job Name
    Field 6 - Number of active targets
    Field 7 - Verification percentage
    Field 8 - PIO Mode
    Field 9 - Read/Write multiple sector count

Job End
    Field 1 - Record type number
    Field 2 - Job Number
    Field 3 - Date
    Field 4 - Time
    Field 5 - Record description string
    Field 6 - Total megabytes copied
    Field 7 - Total elapsed time in seconds
    Field 8 - Number of failed targets

Drive Description
    Field 1 - Record type number
    Field 2 - Job Number
    Field 3 - Blank
    Field 4 - Blank
    Field 5 - Drive Number
    Field 6 - Source/Target drive indicator
    Field 7 - Drive Identification string
    Field 8 - Drive Serial Number
    Field 9 - Drive Status - 1-disabled, 0-good copy, -1-drive error
    Field 10 - Megabytes copied
    Field 11 - Copy result string

Event
> Field 1 - Record type number
> Field 2 - Job Number
> Field 3 - Blank
> Field 4 - Blank
> Field 5 - Drive Number
> Field 6 - Source/Target drive indicator
> Field 7 - Last LBA sector number
> Field 8 - Last drive command
> Field 9 - Number of retries
> Field 10 - Last command descriptive string
> Field 11 - Last section descriptive string
> Field 12 - Last sub-section descriptive string

Files Copied
> Field 1 - Record type number
> Field 2 - Job Number
> Field 3 - Blank
> Field 4 - Blank
> Field 5 - Record description string
> Field 6 - Number of good files copied
> Field 7 - Number of deleted files skipped

5-2.3 Partition Mode Smart Option

The Partition Mode Smart Option can be used to choose one or more partitions from the source drive to be duplicated to the target drives. In addition to choosing one or more partitions, the partitions can also be resized and/or reordered on the target drives. Each target drive configuration can be determined independent of the other target drives. With this option, a source drive can be constructed containing many different software loads, each of which can be duplicated individually to target drives.

When in the Detail mode screens, the parameters shown in this screen can be user-defined using the **DataFast Partition Smart Option**. The same options apply if you had selected one of the other *Target* drives. (The shaded boxes indicate the user-definable fields explained in section 4-1.1.)

```
                      Default user Defined job
      <Esc> = Return to main screen, , <F10> = Set system options
               <Insert> target partition <Delete> target partition
  <F7> = Edit CHS translation parameters <F8>Copy target setup to other targets

     Target 1 Model Number:  QUANTUM FIREBALL_TM3840A
             Serial Number:  396621616730
            Firmware Rev:  A6B.2000          Cylinders:  7480
        Megabyte Capacity:  3682               Heads:  16
            Total Sectors:  7539840      Sectors/Track:  63
  R/W Multi: 16  LBA mode: Yes          ATA PIO Mode:  4

  Source Drive partitions      Target Partition Setup:    Disk Mode: Partition

     Size    Type   System               Size    Copy mode
  1  2016   HUGE   MSWIN4.1        1    2016=Smart Copy
  2  1795   HUGE   MSDOS5.0        2    1662=Smart Copy

   Fri, 29 Jan 1999                                08:36:57 AM    ●
  ┌──────────────────────────────────────────────┬──────────────┐
  │ Status: Select  job — use or keys to browse list. │ Cable Select On │
  └──────────────────────────────────────────────┴──────────────┘
```

From the "Detail mode" menu screen (displayed above), the Partition Smart Option provides features that allow you to change the factory set values for your custom needs. The following sections describe how to use these advanced features.

The "**Disk mode:**" option enables you to switch to the desired job operation (listed below) by using the <**Spacebar**> to select . (Note that the screen options will change with each mode change.)

Partition
DOD Wipeout ⎤ — *These are Smart Options*

Smart
Test Disk
Mirror
Clear Disk ⎤ — *These are normal options*

Disk Mode: Partition

When in the "**Partition mode**", you can change the partition values that were initially set by "Smart Copy" mode. The default settings show the size of the first partition on the *source* drive and all partitions on the *target* drives are proportionately sized.

The Partition mode allows you to:

- set the number of partitions on a target drive (up to 10 partitions)
- manually adjust the size of the partitions on the target drives
- set the source-to-target partition link for duplication
- set each partition's Copy mode: Format only, Blank, Smart Copy, or Mirror Copy

Adding/Deleting Partitions
Command keys: <Ins> <Del>

You can easily add or delete partitions on the target drive by using the <**Ins**> and <**Del**> keys. To add a new target partition, use the cursor keys to select an existing partition "Size" field and press the <**Ins**> key. A new partition line will be added to the bottom of the list of previously defined partitions (if any), and the cursor will be moved down automatically to select the new partition where you can set its parameters.

You can add up to ten (10) partitions. Each partition will be automatically configured in evenly distributed sizes.

To delete a partition, use the cursor keys to select the "Size" field of the partition to be removed. Then, press the <**Del**> key.

Setting a Partition Size

To change a partition size, use the arrow keys to highlight the desired partition's **Size** field on the target drive. Manually type in the desired partition size in megabytes. The partition size must be in a range acceptable to the file system that is to be duplicated on it.

File System Types:

Before you change the partition size, you should review the following information on file system types. The maximum and minimum size allowed for a partition can vary, depending on the file system you are using.

FAT16   Cannot access partitions greater than 2GB. (Used by all versions of DOS, Windows 3.1 and Windows 95A.)

FAT32   Allows drives greater than 2GB to contain a single partition; partitions cannot be less than 512MB. (Used by Windows 95B.)

FAT12   Basically the same as FAT16, but for smaller drive partition sizes up to 64MB.

NTFAT   Cannot access partitions greater than 4GB. (Used by all versions of Windows NT.)

Note that as you change a partition size, other partition sizes will be adjusted to proportionate allocations determined by the remaining amount of space on the drive .

Setting the Partition Copy Mode

You can set the partition's "Copy Mode" by highlighting its "Copy mode" field and pressing the **<Spacebar>** to select one of the following modes:

Partition *Smart* copy mode
This mode supports FAT32, FAT16, FAT12, NTFAT and NTFS source partitions. It will copy any size FAT partition to any size target partition that is within the limits of the source file system, copying file-by-file, adjusting the boot sector, directories and FATs accordingly. Erased files, marked bad sectors and unused sectors (off the master partition) are not copied. Windows 95 long filename information is copied. (The copying will automatically fall back to partition Mirror mode if the source partition file system is unknown.)

Partition *Blank* mode
This mode will create a partition table entry, but will not copy any data.

Partition *Format Only* mode
This mode creates an empty partition with an empty root directory and FAT. Either FAT16 or FAT 32 formats may be copied. In order for a formatted partition to be bootable, a bootable partition of the same type must exist on the source drive. The source drive must contain the format information for FAT16 or FAT32. A FAT16 source cannot be used to create a FAT32 target and vice-versa.

Partition *Mirror* mode
This mode copies to a target partition in a manner similar to the disk Mirror mode, where the source and target heads and sectors per track configuration must be the same, and sectors from the selected source partition are copied directly to the target partition. It is different from the Disk Mirror Copy mode in that the user-defined front and back megabytes copying option is not allowed. The target partition size will automatically be set equal to the source partition size.

Linking Source-to-Target Partitions
Command keys: <Ins> <Del>

Unless you are using Disk Mode: Smart, a source partition must always be "linked" to a target partition to where it will be copied to.

- If you add partitions, you must remember to unlink them from the original source/target relationship.
- The "Copy mode" setting for partitions that are not linked must be set to "Blank".

To link source/target partitions
Move the cursor to the "**Size**" field of the target partition to be linked, then press the cursor **<left-arrow>** key. Then, use the up and down arrow keys to select the desired source partition and press the **<Ins>** key to set a link. The cursor will jump back to the "Size" field of the target partition and an *arrow* will be displayed showing the link between the selected source and target partitions.

To remove a link

Move the cursor to the "**Size**" field of the target partition you wish to unlink, then press the cursor <**left**-**arrow**> key. Then, press the <**Del**> to unlink. Note that the arrow indicating the link should disappear.

Use the <**F8**> key to copy the setup to other targets.

Once you have verified all these parameters, you can press <**Esc**> to return to the Standby screen to set up other targets or perform other options. Press <**F4**> to save the current job settings under the user-defined job name.

```
                     Default User Defined Job

     <F1>=Start copy <F7>=Edit CHS trans. <F10>=Set system options
              <Enter>=Edit copy options for selected target
      <V>=Verify previous copy <Delete>=Disable target  <F9>=View data
                  <F4>=Save current drive settings

Source Drive                      Capacity Status
   WDC AC3400L                       7340   Drive ready
Target Drives
   1 QUANTUM FIREBALL_TM3840A        7340  Drive ready
   2 FUJITSU M1638TAU                7340  Drive ready
   3 ST5 1080A                       7340  Drive ready
   4 IBM-DAQA-32160                  7340  Drive ready
   5 QUANTUM FIREBALL ST6.4 A        7340  Drive ready

Fri, 29 Jan 1999                              08:36:57 AM   .
Status Idle                                   Cable Select On
```

5-2.4 DOD Wipeout Smart Option

The Department of Defense has determined a procedure for sanitizing a hard disk drive. This procedure is specified in document DoD 5220.22-M Chapter 8 Section 3 (8-306).

The Wipeout Smart Option Procedure

The disk sanitization is performed in the following steps:

- Overwrite all addressable locations with a character
- Overwrite all addressable locations with the complement of the character
- Overwrite all addressable locations with a random character
- Verify all addressable locations were overwritten with the random character

Chapter 6
Password Protection

Password protection is used to control what jobs can be executed. This feature is particularly important for guaranteeing the integrity of a job when other users may be involved with the duplicating process. A password can be set so only a selected job can be executed. No other function can be performed without the password.

From any screen, press <**F6**> to set or clear the password. If no password has previously been set, pressing <**F6**> will display the following Set Password screen:

```
                Greystone D-105 software version 5.11
    Press <F1> to execute job immediately, <Enter> to review job setup.
    <Tab> to select list of user defied jobs,  <F2> to copy job to user list.
                     <Tab> = Standard jobs
                  Press <Alt-F4> to edit program
   Greystone Standard Jobs:
      Smart Copy
      Mirror Copy
      Disk Test
      Wipeout            **** Set Password****
                         Please Enter Password

   Fri, 29 Jan 1999                              08:36:57 AM   .

   Status: Select job using cursor keys
```

Set the password by typing up to 12 alpha/numeric characters. Press <**Enter**> to set.

To turn off password protection, press **<F6>** and enter the current password. When asked to enter a new screen password, press the **<Enter>** key to clear.

```
                 Greystone D-105 software version 5.11
         Press <F1> to execute job immediately, <Enter> to review job setup.
         <Tab> to select list of user defied jobs,  <F2> to copy job to user list.
                      Press <Alt-F4> to edit program
      Greystone Standard Jobs:
         Smart Copy
         Mirror Copy
         Disk Test
         Wipeout        This option is password protected.
                          Please Enter Password

      Fri, 29 Jan 1999                              08:36:57 AM  .
      Status: Select job using cursor keys                    Secured
```
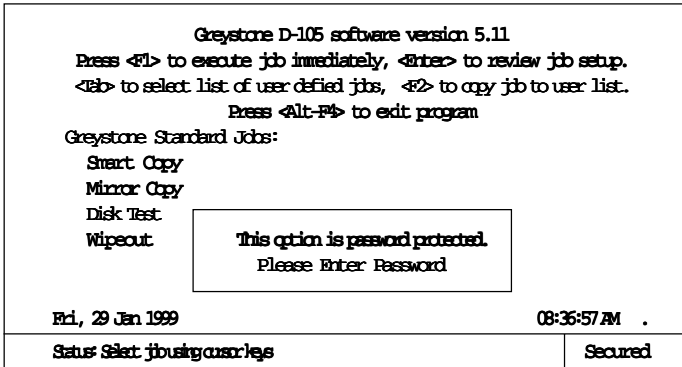
HINT: Steps to allow only one job to be executed:

1. At the standard job screen, select the job to be executed.

2. Press **<F2>** to copy job to User Job list.

3. Highlight the Default User Defined Job and press the **<Del>** key to remove the Default User Defined Job from the User Job list.

4. Press **<F10>** to go to System Options screen.

5. Select the '**Start with user jobs screen**' option and press **<Esc>** to return to User Job screen.

6. Set the password. This will allow only the job copied to the User Defined Jobs menu to be executed.

Chapter 7
Questions & Answers

This chapter covers some of the basic questions and answers that may help you regarding the use of the D-105 duplicator.

7-1 General

Q: **When calling Tech Support, what information should I have handy?**

A: The *serial number* from the back of the duplicator. The *version of software* when the duplicator was purchased.

Q: **How do I change the Time and Date on the duplicator?**

A: Exit the duplication software by pressing the <**Alt**> and <**F4**> keys. At the DOS prompt, type **TIME** to change the time. Type **DATE** to change the date. After the time and date are set, type **GO** to restart the duplication software.

Q: **I want to duplicate a multiple partition disk drive.**

A: From the "Greystone Standard Jobs" screen select "Smart Copy". The target drive will contain the same partition structure as the source drive. The partition sizes on the source drive will be adjusted to fit onto the target drive. For example, given a source drive with three partitions using 40%, 35% and 25% of the disk, the target drive will also be partitioned with three partitions that use 40%, 35% and 25% of the disk. When a FAT16 partition on a target disk will be larger than 2 GB, the partition is limited to 2 GB and additional partitions are allocated on the target drive. If more control over partitioning is desired, press the <**Tab**> key from the Greystone Standard Jobs screen to go to the User Jobs screen and create a new user job, where all the partition allocations can be controlled by the user.

Q: **What happens if an error is detected on a target drive or source drive during the duplication process?**

A: If the error is detected on the source drive, the duplication process will halt and an error box with the detected error will be displayed. If the error is detected on a target drive, the drive is disabled and the duplication process continues. At the end of the duplication process the drive with the error is reported as a bad drive and the error is logged to the log file if error logging is enabled.

Q: **When should I connect the disk drives to the D-105?**

A: Greystone Peripherals recommends starting the D-105 and waiting for the "Greystone Standard Jobs" screen to appear before connecting the master and target drive(s).

Q: **When I duplicate my Windows 95 1.6 GB disk drive to a 6 GB disk drive, I end up with three partitions on the 6 GB disk drive. I only want one partition on the 6 GB disk drive. What should I do?**

A: Your Windows 95 1.6 GB disk is formatted with the 'FAT16' file system. The FAT16 file system supports partitions up to 2 GB. When duplicating the FAT16 file system, the target disk is automatically partitioned into 2 GB partitions. In other words, a 6 GB disk will be partitioned into three 2 GB partitions. This is a limitation of the FAT16 file system. A possible solution is to obtain the FAT16-to-FAT32 converter from the Microsoft® Web site and upgrade the source disk drive to the FAT32 file system. The FAT32 file system will support a single partition on any size disk drive.

Q: **I want to duplicate NTFS, can I do it?**

A: Yes. The NTFS partition on the target disk drive will be the same size as the partition on the source drive. The remaining space on the target drive is available for allocation using FDISK or Disk Administrator. Target drives must be the same size, or larger than the source drive.

Q: **How do I change my screen colors?**

A:: You can change the screen colors by editing the **Hardware.ini** file on the D-105's program disk. REMEMBER: ALWAYS MAKE A BACKUP COPY OF THE BOOT DISK BEFORE MAKING ANY CHANGES TO THE BOOT DISK. Set "ColorDisplay = 1" to enable color display. Each screen item's foreground and background color can be set. The color is set using a two digit number, the first digit is the background color and the second digit is the foreground (text) color. The colors are assigned to the digits as follows:

0 - Black	**4** - Red	**8** - Grey	**C** - Lt Red
1 - Blue	**5** - Magenta	**9** - Lt Blue	**D** - Lt Magenta
2 - Green	**6** - Brown	**A** - Lt Green	**E** - Yellow
3 - Cyan	**7** - White	**B** - Lt Cyan	**F** - Lt White

Q: **How do I contact Greystone Peripherals?**

A: For Technical Support call: **(408) 866**-**4739**
Monday - Friday
9:00 a.m. to 5:00 p.m. PST

For Sales, call toll free: **(800) 600**-**5710** or **(408) 866**-**4739**

To order by Fax call: **(408) 866**-**8328**

Q: **Does Greystone Peripherals, Inc. have a World Wide Web page?**

A: Yes. Greystone Peripherals, Inc. can be found on the World Wide Web at **http://www.grystone.com**. Check our Web site often for exciting new product announcements, information about our existing product lines and product upgrade information.

7-2 Smart Options

Q: How do I activate a Smart Option?

A: Press <**F5**> to activate the Smart Option menu screen. Using the up and down arrow keys select the Smart Option you want to activate. Push the <**Space bar**> to activate the Smart Option. When the Smart Option Key entry box appears, enter the Smart Option Key and push the <**Enter**> key. If the Smart Option Key is correct, a checkmark will appear in the box next to the selected Smart Option.

Q: How do I get a Smart Option Key?

A: When the Smart Option Key entry box is displayed, write down the internal serial number that is displayed on the bottom line of the box. Write down the serial number that is on the back of the duplicator, (usually near the power plug). Call Greystone Peripherals at (408) 866-4739 and ask to speak to the person responsible for Smart Option sales.

Q: How do I know that my selected Smart Option has been activated?

A: As the duplicator starts up, the enabled and disabled Smart Options information box will be displayed. The operator can activate the Smart Options menu <**F5**> key at any time to view options that have been enabled.

For Technical Support call:	**(408) 866-4739**
	Monday - Friday
	9:00 a.m. to 5:00 p.m. PST
For Sales, call toll free:	**(800) 600-5710** or **(408) 866-4739**
To order by Fax call:	**(408) 866-8328**
World Wide Web:	**http://www.grystone.com**
	http://www.greystoneperipherals.com
Fax-Back:	**(408) 866-6956 Ext. 401**