

***DiskOnChip GANG Programmer***  
***Revision C***  
***User Manual***

**July 2004**  
**91-SR-004-03-7L Rev. 5.3**

---

---

## DOCUMENT CONTROL INFORMATION

DCO No.:

	<b>Title</b>	<b>Name</b>	<b>Date</b>
<b>Issued by:</b>	Product Manager	Iris Brezner	July 15, 2004
<b>Approved by:</b>	VP Marketing	Ofer Tzur	July 15, 2004

## TABLE OF CONTENTS

<b>1. Introduction to the DiskOnChip GANG Programmer.....</b>	<b>5</b>
1.1. Overview .....	5
1.2. Supported Devices .....	5
<b>2. Device Description.....</b>	<b>6</b>
2.1. General .....	6
2.2. Operating Panel .....	6
2.2.1. Features.....	6
2.2.2. GANG Programmer Buttons .....	7
<b>3. Installation Instructions.....</b>	<b>8</b>
<b>4. Operating Instructions.....</b>	<b>9</b>
4.1. General Guidelines.....	9
4.2. Working With the Scroll Buttons.....	9
4.3. Duplication Guidelines.....	9
<b>5. Duplicating DiskOnChip .....</b>	<b>10</b>
5.1. Overview .....	10
5.2. Reading the Source Device Image.....	10
5.2.1. Reading an Image for a Single Device .....	10
5.2.2. Reading a Cascaded Image Intended for Duplication on Single Devices .....	11
5.3. Programming the Target Units .....	12
5.3.1. Programming Devices from a Single Image .....	12
5.3.2. Programming Single Devices from a Cascaded Master Image.....	13
<b>6. Working with Protected Devices .....</b>	<b>14</b>
6.1. Reading a Protected Master.....	14
6.2. Duplicating to Protected Targets .....	14
<b>7. Q-Menu Operations.....</b>	<b>15</b>
7.1. Verifying the Contents of DiskOnChip.....	15
7.1.1. Single Target DiskOnChip .....	15
7.1.2. Target DiskOnChip that is Part of a Cascaded Array .....	16
7.2. Retrieving Master Image Information .....	16
7.3. Deleting the Master Image from the GANG Programmer .....	16
7.4. Clearing All Log Files .....	17
7.5. Starting New Log Files .....	17

---

7.6. Stopping the Log .....	17
7.7. Downloading a Log File.....	17
7.8. Performing a Self-Test .....	17
<b>8. Shutting Down the GANG Programmer .....</b>	<b>18</b>
<b>9. Error Messages .....</b>	<b>19</b>
9.1. Source DiskOnChip Error Messages .....	19
9.2. Errors Generated During Duplicate or Verify Operations .....	20
<b>10. Known Limitations .....</b>	<b>21</b>
<b>11. Troubleshooting.....</b>	<b>22</b>
<b>12. Q &amp; A .....</b>	<b>23</b>
<b>13. Specifications.....</b>	<b>25</b>
13.1. Software and Hardware.....	25
13.2. Files.....	25
13.2.1. Log File Structure .....	25
13.2.2. Additional File Information .....	25
<b>How to Contact Us .....</b>	<b>26</b>

# 1. INTRODUCTION TO THE DISKONCHIP GANG PROGRAMMER

## 1.1. Overview

The DiskOnChip GANG Programmer is a standalone GANG programmer that can rapidly duplicate DiskOnChip devices. It is intended for generating mass-production quantities of DiskOnChip-based products. The DiskOnChip GANG Programmer has nine sockets, one for the “master” or “source” DiskOnChip device, and eight for the “target” DiskOnChip devices. The DiskOnChip GANG Programmer implements a sophisticated algorithm for programming all DiskOnChip units in parallel to achieve very high programming rates, which can lower production time and costs. Other DiskOnChip packages, such as TSOP-I, TSOP-II, FBGA, and SODIMM can also be programmed using special adapters.

Customers that have to maintain multiple images can store them on a CD-ROM. Revision C of the DiskOnChip GANG Programmer can read source images located on the root directory of the CD-ROM and place them on your target devices. The master DiskOnChip (or source file read from a CD-ROM) is copied to an internal image file, which is then used as the duplication source. The duplication process can be repeated as many times as required, without requiring the master DiskOnChip in the source socket.

The standalone DiskOnChip GANG Programmer is shipped ready to use; simply plug in the power cable and start working.

## 1.2. Supported Devices

The M-Systems DiskOnChip gang programmer supports the entire DiskOnChip product line to date including:

- DiskOnChip Millennium Plus (16MB-64MB), including cascaded devices
- DiskOnChip Millennium: (8MB)
- DiskOnChip 2000 (16MB-1GB)
- DiskOnChip DIMM Plus (32MB-128MB)

Supported form factors include:

- 32-pin DIP: on-board
- 144-pin DIMM: Using a DIMM-to-DIP adapter
- 48-pin TSOP-I: Using TSOP-I-to-DIP ZIF adapter
- 32-pin TSOP-II: Using a TSOP-II-to-DIP ZIF adapter
- 69-ball/63-ball FBGA: Using an FBGA-to-DIP ZIF adapter

## 2. DEVICE DESCRIPTION

### 2.1. General

The DiskOnChip GANG Programmer is composed of a Pentium-class, CPU-based host PC and an operating panel. The operating panel includes the following:

- 1 + 8 sockets for DiskOnChip DIP or DIMM products
- Buttons for controlling GANG operations
- LCD screen
- LED indicators

### 2.2. Operating Panel

#### 2.2.1. Features

The operating panel, shown in Figure 1, has one source socket in the upper left-hand corner, and eight target sockets labeled 1 to 8 below the source socket. Each socket has an indicator LED. The LED status descriptions are defined in Table 1.

An LCD screen located next to the source socket displays status messages and error codes. Seven buttons, located above the target sockets, are used to activate and control the DiskOnChip GANG Programmer.

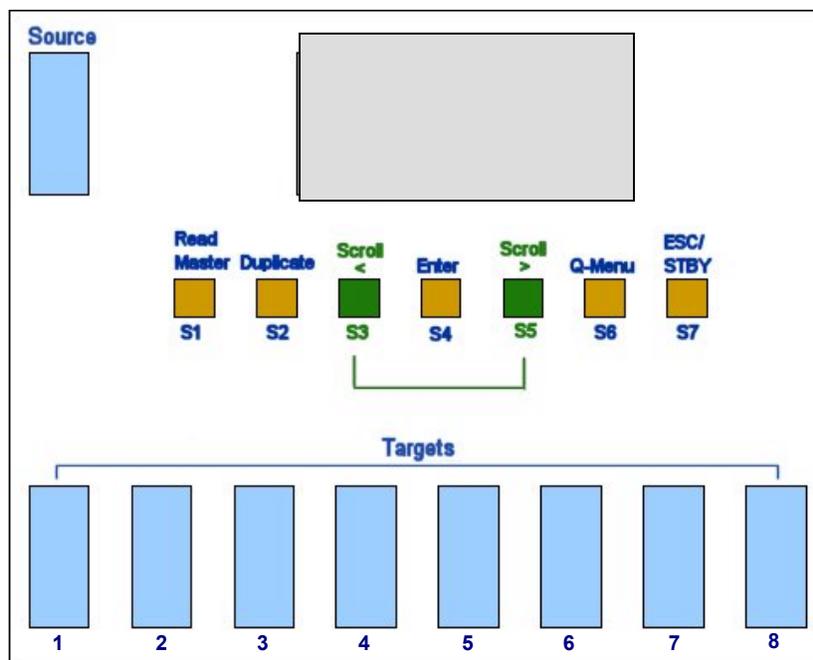


Figure 1: DiskOnChip GANG Programmer Operating Panel

Table 1: LED Status Descriptions

LED	Action	Description
Status	No signal	Inactive
	Flashing	Active
	Green	Last operation successful
	Red	Last operation failed

### 2.2.2. GANG Programmer Buttons

The DiskOnChip GANG Programmer has seven buttons. The following guidelines define the buttons' behavior:

1. The software samples the buttons whenever possible.
2. If any button is pressed (with the exception of the ESC/STBY button) during the execution of a command, it has no affect on GANG Programmer operation.

#### ESC/STBY Button

The ESC/STBY button has the following functionality:

- When ESC/STBY is pressed, the GANG safely stops its current task and displays the following on the LCD screen:

```
Aborting xxxxx
Are you sure?
Yes      No
```

Where: **xxxx** is the operation being aborted (read or duplicate), and **No** is the default answer.

- ESC/STBY is inactive during duplicate and read-master operations.
- Pressing ESC/STBY when the GANG Programmer is in Idle mode invokes the shutdown menu.
- When reviewing the GANG menus, ESC/STBY can also be used to go back one menu (this functionality is similar to the **Back** button in Internet browsers).

Table 2: DIP GANG Programmer Button Functions

Press	To
Read Master	Copy the source image from in the source socket, or the CD-ROM, to an image file on the internal hard disk.
Duplicate	Copy the image file from the hard disk to all the DiskOnChip devices inserted in the target sockets.
Scroll < and >	Scroll up/down or left/right, according to the direction of the arrow.
Enter	The action invoked by this button changes according to the onscreen instructions.
Q-Menu	Invoke a menu with additional options, such as <b>Image Info</b> , <b>Verify Image</b> , or <b>Clear Image</b> . Other options may be added to this menu in the future. See Section 7 for further details.
ESC/STBY	Exit the current operation, or go back one level when browsing menus. Pressing this button when the GANG Programmer is in Idle mode invokes the shutdown menu.

### 3. INSTALLATION INSTRUCTIONS

#### To install the GANG Programmer:

1. Connect the power cord to the power supply.
2. Power on the unit. The following message is displayed:

```
Loading GANG
Software...
Please Wait
(Approx 2 Min)
```

Note: The GANG Programmer may take up to two minutes to initialize.

3. When the boot process is complete, the screen displays the following:

```
GANG Programmer
H/W V.1.0
S/W V5.1.4.4
Date June 2004
```

4. The GANG Programmer is now ready for operation.

#### To shut down the GANG Programmer:

1. Press ESC/STBY while the GANG Programmer is in Idle mode (ready and waiting for instructions). The following message is displayed:

```
Do you want to Exit
and Shutdown?
Yes      No
```

2. Highlight **Yes** using the scroll buttons, and then press Enter. The system saves the current log file and powers down. The following message is displayed:

```
Shutting down
(Please wait)
Good Bye...
```

Note: There is a long wait before the GANG Programmer completes its shutdown process.

3. After the GANG Programmer completes its shutdown sequence, it automatically powers down.

---

## 4. OPERATING INSTRUCTIONS

### 4.1. General Guidelines

To ensure fault-free operation of the DiskOnChip GANG Programmer, observe the following conditions:

- Place the GANG Programmer in a location that is stable, well ventilated, and out of direct sunlight.
- No DiskOnChip devices should be in the GANG Programmer sockets while power is being turned on or off.
- Do not touch the DiskOnChip devices unless the status LED is off, or lit steady green or red.
- Do not turn off the GANG Programmer without first exiting the GANG software using the ESC/STBY button.

It is highly recommended to visit the M-Systems website ([www.m-systems.com](http://www.m-systems.com)) occasionally to benefit from new features and upgrades.

### 4.2. Working With the Scroll Buttons

The scroll buttons are used to navigate the various GANG Programmer menus and operations. Use them to move left or right (for example, when choosing the **Yes** or **No** option) or to move up and down. Navigation through the GANG Programmer menus is cyclic, meaning that scrolling past the last menu item returns you to the first menu item.

**To select a menu option:**

- Use the scroll buttons to highlight the required option, and then press Enter.

Note: The selected menu item flashes continuously until you press Enter or navigate elsewhere.

### 4.3. Duplication Guidelines

The source and target devices *must* be identical. Images cannot be passed between two different devices, even if they have the same capacity. For example, an image read from DiskOnChip 2000 DIP 32MB (MD2202-D32) cannot be placed on DiskOnChip Millennium Plus 32MB (MD2811-D32) and vice versa. This is due to differences in the flash media characteristics of each DiskOnChip model (primarily differences in erasable block sizes or flash media capacity). In addition, all target devices must be identical to each other in all aspects (including voltage).

The GANG programmer also supports programming single DiskOnChip Plus devices that are to be used as part of a cascaded array.

## 5. DUPLICATING DISKONCHIP

### 5.1. Overview

To duplicate a DiskOnChip the following steps must be performed:

- An image is read from a master device, CD ROM, or M-Systems DiskOnKey. The source image is automatically saved to the GANG Programmer hard drive at the end of the Read operation. This step is not required if the source image is already present on the hard drive from a previous duplication operation.
- A duplication operation is initiated, and the GANG Programmer copies the image from the hard drive to the target units.
- The source and target unit images should be compared to verify that they are identical. This is a relatively time-consuming operation, as each device must be compared separately.

These steps are outlined in detail in the sections that follow.

### 5.2. Reading the Source Device Image

#### 5.2.1. Reading an Image for a Single Device

**To read the image from a master device or CD-ROM:**

1. Press Read Master. The LED under the source socket flashes red, indicating that the GANG Programmer is active. The following message is displayed on the LCD screen:

```
Reading from master  
  
Please wait
```

2. If no master device is found, the GANG Programmer asks to search for the source image on a CD-ROM. The following message is displayed:

```
Master device not  
found. Look for IMAGE  
in CD ROM?  
Yes           No
```

3. Select **Yes** (default). The GANG Programmer searches for files with an .IMG extension in the root directory of your CD-ROM. Use the scroll buttons to navigate through the file names.

**Example:**

```
-Image#1.img (32MB)
-Image#2.img (16MB)

<back           More>
```

Scrolling right and left traverses the file names, and then continues through the navigation icons (More>).

4. Select the required file and press Enter. The following is displayed:

```
Reading xxxMB
Completed OK.
Press Duplicate to
commence duplication
```

- Notes:
1. The image of the source DiskOnChip is kept on the hard disk of the GANG Programmer until a new source DiskOnChip is read.
  2. Note: Images kept on CD-ROM should have an .IMG file extension or they will not be recognized by the GANG Programmer.

### **5.2.2. Reading a Cascaded Image Intended for Duplication on Single Devices**

The GANG Programmer supports duplication of single devices that are part of a cascaded lot. However a partial master image cannot be read from a device that is part of a cascaded lot. Therefore, a cascaded image intended for duplicating single devices can only read from either a CD-ROM or an M-Systems DiskOnKey.

If a single device that is part of a cascaded array, is used as the master, DiskOnChip displays the following message:

```
Can't read Partial
Image. Look for
IMAGE in CD ROM
Yes    No
```

## 5.3. Programming the Target Units

### 5.3.1. Programming Devices from a Single Image

**To copy the source image to the target units:**

1. Place up to eight target DiskOnChip devices, identical to the source device (both in capacity and model), into the target sockets. Verify that the polarity is correct.
2. Press Duplicate. The GANG Programmer starts copying the source image to each DiskOnChip device. During the duplication process, the LED for each active socket indicates its status (refer to Table 1). The LCD screen displays the following:

```
Copy in progress...

Socket #   12345678
Status    ✓✓-⌚-X-✓
```

The numbers that appear after **Socket #** indicate the socket number. Each socket number is located just above its status indicator. The following symbols are displayed in the status indicators:

- o ‘✓’ indicates that the operation was successful.
  - o ‘-’ rotates while the socket is active.
  - o ‘X’ indicates an error. This symbol flashes and toggles between the ‘X’ sign and the relevant error code number.
  - o ‘⌚’ indicates that the device is waiting for other sockets to complete a serial operation.
3. When the duplication process is complete, each socket displays its status and the following message is displayed on the LCD screen:

```
Copy completed.

Socket #   12345678
Status    ✓✓✓✓1✓✓
>Cont    See errors
```

A red LED indicates a socket with a fail status. The LCD screen also displays the error code. All DiskOnChip devices that were successfully duplicated (with a green LED) now contain contents identical to the source DiskOnChip device. All DiskOnChip devices with a red LED must be checked.

- If there are no errors, proceed to step 7 by highlighting the **Cont** option (if the option is not highlighted by default) and pressing Enter. If the display indicates that errors occurred, highlight **See errors** using the scroll buttons and press Enter to display a list of the problematic sockets and their error codes.

```
Socket #5 - Err 1
Socket #7 - Err 3
```

Up to four error lines can be displayed per screen. If there are more than four sockets with errors, a **More** option is displayed. Select **More** to advance to the next page (more sockets with errors).

- To view error details, press Enter when the required error line is highlighted.
- After the errors have been reviewed, press ESC to return to the screen shown in step 3.
- Select whether to continue the duplication (default) process or verify the contents of the programmed targets.

```
-Duplicate another
-Verify targets
-Exit
```

To continue duplicating units, replace the programmed target units with new units and press Enter to start a new duplication session.

OR

To verify the target units, leave the programmed units in the GANG programmer and continue with the procedure in Section 7.1.

### 5.3.2. Programming Single Devices from a Cascaded Master Image

#### To program a single device using a cascaded master image:

- When the GANG Programmer detects that a duplication operation has been initiated on a single device using a cascaded master image (extracted from up four DiskOnChip devices cascaded together), the following is displayed:

```
-Copy first floor
-Copy second floor
-Copy third floor
-Copy fourth floor
```

Select the floor you are programming.

Note: You cannot program cascaded devices with an IPL code larger than 512KB.

## 6. WORKING WITH PROTECTED DEVICES

### 6.1. Reading a Protected Master

The relevant password is required to read a protected master (this issue is currently relevant only for DiskOnChip Millennium Plus). As the GANG Programmer does not have a keyboard, the password must be supplied using a floppy diskette. Use the KEYDISK utility included with the DiskOnChip software utilities to create this diskette.

#### To duplicate a protected device:

- When the following screen is displayed after the read operation from the master unit, press Enter:

```
Master image is
protected.
Insert key disk to A:
and press ENTER
```

The software reads the disk and extracts the read and write passwords required to complete the read operation. The passwords are then stored in the image itself. From this point on, the diskette is no longer required.

Note: This does not apply to images read from a CD-ROM.

### 6.2. Duplicating to Protected Targets

The GANG Programmer enables writing to protected targets if the following two conditions are met:

- The target units are partitioned in exactly the same way as the master device and use the same passwords (The size of the partitions may vary, but not their order).
- A Key Disk is supplied for the targets. This is only applicable when all target units use the same password.

When Duplicate is pressed and the targets are protected, the LCD screen displays the following:

```
Target units are
protected.
Insert key disk to A:
and press ENTER
```

If some targets are protected and others are not; the duplication operation fails and the following is displayed:

```
Please remove
protected units from
sockets #:
n,n,n
```

## 7. Q-MENU OPERATIONS

The Q-Menu provides access to operations performed on an infrequent basis, and also enables the user to access the GANG Programmer maintenance options. The Q-Menu includes the following options, discussed in detail in the sections that follow:

- Verify Image
- Image Info
- Clear Image
- Clear All Log Files
- Start New Log File
- Don't Log
- Download Log File
- Self Test

### 7.1. Verifying the Contents of DiskOnChip

#### 7.1.1. Single Target DiskOnChip

To verify the contents of DiskOnChip:

1. Insert the DiskOnChip units to be compared (with an image stored on disk) into the GANG Programmer.
2. Press Q-Menu and select the first option.
3. When the compare operation is complete, the following screen is displayed:

```
Compare completed
Socket #      12345678
Status       ✓7✓✓✓✓✓
>Cont      See Errors
```

4. To compare additional units, replace the verified units with new target units and press Enter (when the **Cont** option is selected) to repeat the operation.

Note: Continue (**Cont**) is the default option.

### 7.1.2. Target DiskOnChip that is Part of a Cascaded Array

When the target is a single device that is part of a cascaded DiskOnChip array, the GANG Programmer analyzes the master image and compares the target image with the appropriate floor of the master image stored on the GANG hard drive, for verification. For example, after verifying a target that is the second device in a cascaded array of three DiskOnChip devices, the following is displayed on the LCD screen:

```
Compared floor 2:
Socket #      12345678
Status       ✓✓✓✓✓✓
Compare again? Y N
```

The verification process for these DiskOnChip devices is the same as the process described in Section 7.1.

Note: If two or more floors have the identical format, the LCD screen may display the incorrect floor number. However, the actual floor compared in the verification process is correct.

## 7.2. Retrieving Master Image Information

To retrieve master image information:

1. Press Q-Menu and select **Image info**. The LCD screen displays the master image data stored on the hard drive. **xxx** represents the capacity required from the target unit.

```
Image size: xxxMB
Target: xxxMB
Format: INFTL
More>
```

2. Press **More** to view the image creation date, and the date the image was placed on the disk. The following is displayed:

```
Modified: DD/MMM/YYYY
<Back
```

## 7.3. Deleting the Master Image from the GANG Programmer

To delete a previously stored master image from the GANG Programmer:

- Press Q-Menu and select **Clear Image**. The following is displayed:

```
Image size is xxxMB
Target size:xxx
Delete? Yes    No
```

Where: **xxx** represents the capacity of the target unit.

---

## 7.4. Clearing All Log Files

To clear all log files:

1. Press Q-Menu and select **Clear all Log files**.
2. When the next screen is displayed, select **Yes**. The following is displayed:

```
Have you backed up your
log files?
Yes - Clear all
No - Cancel operation
```

3. Select **Yes** to clear all log files.

## 7.5. Starting New Log Files

You can start a new log file without deleting the previous log information, which is relevant when duplicating DiskOnChip units from several different projects. To start a new log file, press Q-Menu and select **Start new Log file**.

## 7.6. Stopping the Log

Use this option to stop the GANG Programmer from maintaining a log file. This is not recommended when duplicating protected devices. To stop logging, press Q-Menu and select **Don't Log**.

## 7.7. Downloading a Log File

To download a log file from the GANG Programmer, press Q-Menu and select **Download Log File**. The following screen is displayed:

```
Select Destination:
  A:   E:
Files will be placed
in root directory.
```

Using the scroll keys, select the target destination (either drive A or drive E when using DiskOnKey), and then press Enter.

## 7.8. Performing a Self-Test

To run a self-test program verifying the functionality of the GANG Programmer, press Q-Menu and select **Self Test**.

---

## 8. SHUTTING DOWN THE GANG PROGRAMMER

### To shut down the GANG Programmer:

1. Press ESC/STBY for one second while the GANG Programmer is in Idle mode (waiting for instructions). The following message is displayed:

```
Do you want to Exit
and Shutdown?

    Yes      No
```

2. Select **No** (default) and press Enter. The systems returns to Idle mode.

### **OR**

Select **Yes**. The system saves the current log file and shuts down, and the following message is displayed:

```
Shutting down
(Please wait)

Good Bye...
```

Note: The shutdown process may take up to two minutes.

## 9. ERROR MESSAGES

### 9.1. Source DiskOnChip Error Messages

Table 3 describes the error messages that may be displayed while executing the “Read from Master” operation.

*Table 3: "Read from Master" Error Messages*

Message	Problem	Possible Solutions
"Master DiskOnChip not found in socket"	No DiskOnChip unit is available in the socket.	<ul style="list-style-type: none"> <li>▪ Place DiskOnChip units in the target sockets.</li> <li>▪ Insert a CD-ROM with a source image.</li> </ul>
	The DiskOnChip unit is damaged or was inserted incorrectly into the socket.	Verify DiskOnChip polarity. Try to replace the target unit.
"Master DiskOnChip Error"	The DiskOnChip unit placed in the master socket was recognized, but is faulty.	Replace the target DiskOnChip.
"General Failure"	A general system failure occurred.	Try to reboot.
"No DiskOnChip images found on current CD"	An empty CD was inserted, or no images were found on the CD used.	<ul style="list-style-type: none"> <li>▪ Use the correct CD.</li> <li>▪ Move the images to the root directory of the CD.</li> <li>▪ Verify that all image files have an .IMG extension (for example, source.img)</li> <li>▪ The CD-ROM may be faulty. Contact M-Systems tech support.</li> </ul>
"Master DiskOnChip has bad or unexpected format"	An incorrect format was encountered.	The format of the source DiskOnChip unit is incorrect. Check your master device or contact M-Systems technical support.
"Error writing Master image to disk"	The system failed to write the DiskOnChip image to the hard disk.	<ul style="list-style-type: none"> <li>▪ Is the previous source image write protected?</li> <li>▪ You may need to replace your GANG hard drive. Please contact M-Systems technical support.</li> </ul>
"An unknown error has occurred with the CD. Aborting. Press any key"	The system failed to read the image file from the CD.	The CD-ROM may be faulty or the CD may be damaged.

## 9.2. Errors Generated During Duplicate or Verify Operations

Table 4 describes error codes that may be displayed on the LCD screen while executing a Duplicate or Verify operation.

*Table 4: "Copy to Targets" Error Codes*

<b>Code</b>	<b>Description</b>
✓	OK
1	DiskOnChip is in the socket (the socket is empty).
2	The target DiskOnChip inserted is of a different type than that required by the image.
3	Bad DiskOnChip device.
4	DiskOnChip was found but could not be read.
5	The OTP of the target device is locked.
6	Too many bad blocks on DiskOnChip (replace the target unit)
7	Target and source images are different.
U	The unit in the target socket is unformatted (applicable for verify operations).

---

## 10. KNOWN LIMITATIONS

The following known limitations exist for GANG software version 5.1.4.4:

1. If several DiskOnChip devices are placed in the target sockets in the wrong direction, the GANG Programmer may fail all the target devices, even those that were placed correctly. The error number is 1, and there is no damage to the devices.
2. DiskOnChip 2000 and DiskOnChip Millennium have the same master image file. You can therefore program a mix of target devices without generating an alert from the GANG Programmer.
3. The maximum number of characters that the master image file name can contain is 16 for the name, + 1 for '.' + 3 for the extension 'IMG'. The total number is 20 characters.
4. The GANG software supports a BDK signature only in offset 8, not in offset 0.
5. Starting with GANG software version 5.1.4.2, a new image must be created either by the GANG Programmer (read master function) or the GETIMAGE utility, version 5.1.4.1-beta and higher

The image format of the GANG software version 5.1.4.4 is fully compatible with the image format for version 5.1.4.2.

---

## 11. TROUBLESHOOTING

If you experience a problem while using the GANG Programmer, try to solve it using the following guidelines. If you cannot solve the problem, contact your nearest M-Systems representative for technical support.

**Problem: I pressed the power button, but nothing happened.**

Solution: Make sure that the power cord is plugged in to an outlet.

**Problem: The GANG Programmer boots up, but no message is displayed on the LCD screen and the buttons do not respond.**

Solution: Make sure no floppy diskette was left in the floppy drive. You may connect a screen, keyboard, and a mouse to the GANG Programmer and view BIOS or OS-related setting and errors.

**Problem: One target DiskOnChip unit failed while all the other units passed.**

Solution: Check the error status displayed on the LCD screen.

Are the DIP ZIF sockets closed? Was the faulty DiskOnChip inserted correctly? Try the last operation again. If it fails a second time, look at the DiskOnChip device leads. Are they clean? Are any pins broken? Try another unit in the same socket, and try the failed unit in another socket.

**Problem: One target DiskOnChip unit failed while all the other units passed. I put the unit in a different target socket, but it keeps failing.**

Solution: Is the DiskOnChip voltage correct? Check the error status indicated in the LCD display.

Note: The DiskOnChip unit may be faulty. Contact your nearest dealer.

**Problem: The duplication operation constantly fails on all sockets used.**

Solution: Verify that you are using the correct DiskOnChip model in the target sockets. Use the identical model to the one from which the source image was extracted. Check the error status displayed on the LCD screen.

## 12. Q & A

The following list of questions has been compiled from feedback to M-Systems' technical support team. We recommend reading this chapter before contacting technical support.

**Q: Should I leave the master DiskOnChip in the master socket after it was successfully read to an image file?**

A: No. After the file has been read, it is kept on the internal hard disk until a new source is copied. However, it is recommended to remove the master DiskOnChip and keep it in a safe place as a backup.

**Q: I accidentally pushed Read when the master socket was empty. Have I lost the image file that was stored on the hard disk (the one that was copied last)?**

A: No. The image file is erased/replaced only if Read is pressed while a DiskOnChip is in the master socket.

**Q: Will the GANG Programmer support future DiskOnChip products?**

A: Yes. M-Systems releases a new firmware version for the DIP GANG Programmer each time a new DiskOnChip product is released.

**Q: Do I have to put eight DiskOnChip units in the target sockets every time I perform a duplication process?**

A: No. You can simultaneously duplicate *up to* eight devices. The software automatically detects the sockets that contain DiskOnChip units. All empty sockets are ignored.

**Q: I accidentally programmed the same eight DiskOnChip units twice. Did I cause any damage?**

A: No. You can reprogram the same devices as many times as you want. No damage is caused this way.

**Q: Can I duplicate DiskOnChip using a file from a floppy disk or other storage media, other than the master unit?**

A: Yes. You can read a master image from the root directory of a floppy diskette or a CD-ROM.

**Q: Can I use an 8MByte DiskOnChip as a master and a 16MByte DiskOnChip as the target?**

A: No. The master and the target DiskOnChip must be of the same capacity.

**Q: Can I use an old high-profile 32MByte DiskOnChip (MD2201-D32) as the master unit, and a new low-profile 32MByte DiskOnChip (MD2202-D32) as the target unit?**

**A:** No. The source and target units must be the exact same model, because different models may use different flash devices.

## 13. SPECIFICATIONS

### 13.1. Software and Hardware

Operating system	Windows 2000
CPU	Intel Pentium MMX, 233 MHz
CD-ROM	Slim Type
Floppy disk	One 3.5" floppy (1.44MB), standard size
Power supply	110V/220V (manually selectable)

### 13.2. Files

#### 13.2.1. Log File Structure

The log file contains the following comma-separated fields:

Generic order information	Numeric
Password	Alpha Numeric
Device ID	Alpha Numeric
Customer ID	Alpha Numeric
Image size (MB)	Numeric
Socket number	Numeric
Error code	Numeric
Day	Numeric
Month	Numeric
Year	Numeric
Time	(xx:xx) Numeric

#### 13.2.2. Additional File Information

*Table 5: File Locations and Descriptions*

File Name	Location	Description
ImageFile.img	C:\GANG\	The image file read from the master unit.
ddmmyyyy#n.log	C:\GANG\LOGFILE\	The log files for all duplication operations: <b>ddmmyyyy</b> : The time the file was created. This information does not change if a session is continued over more than one day. <b>#n</b> : Indicates the session number for that day if more than one session is created in a specific day. The default is "#1".

## HOW TO CONTACT US

### USA

M-Systems Inc.  
8371 Central Ave, Suite A  
Newark CA 94560  
Phone: +1-510-494-2090  
Fax: +1-510-494-5545

### Japan

M-Systems Japan Inc.  
Asahi Seimei Gotanda Bldg., 3F  
5-25-16 Higashi-Gotanda  
Shinagawa-ku Tokyo, 141-0022  
Phone: +81-3-5423-8101  
Fax: +81-3-5423-8102

### Taiwan

M-Systems Asia Ltd.  
14 F, No. 6, Sec. 3  
Minquan East Road  
Taipei, Taiwan, 104  
Tel: +886-2-2515-2522  
Fax: +886-2-2515-2295

### China

M-Systems China Ltd.  
Room 121-122  
Bldg. 2, International Commerce & Exhibition Ctr.  
Hong Hua Rd.  
Futian Free Trade Zone  
Shenzhen, China  
Phone: +86-755-8348-5218  
Fax: +86-755-8348-5418

### Europe

M-Systems Ltd.  
7 Atir Yeda St.  
Kfar Saba 44425, Israel  
Tel: +972-9-764-5000  
Fax: +972-3-548-8666

### Internet

[www.m-systems.com](http://www.m-systems.com)

### General Information

[info@m-sys.com](mailto:info@m-sys.com)

### Sales and Technical Information

[techsupport@m-sys.com](mailto:techsupport@m-sys.com)

This document is for information use only and is subject to change without prior notice. M-Systems Flash Disk Pioneers Ltd. assumes no responsibility for any errors that may appear in this document. No part of this document may be reproduced, transmitted, transcribed, stored in a retrievable manner or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise, without prior written consent of M-Systems.

M-Systems products are not warranted to operate without failure. Accordingly, in any use of the Product in life support systems or other applications where failure could cause injury or loss of life, the Product should only be incorporated in systems designed with appropriate and sufficient redundancy or backup features.

Contact your local M-Systems sales office or distributor, or visit our website at [www.m-systems.com](http://www.m-systems.com) to obtain the latest specifications before placing your order.

© 2004 M-Systems Flash Disk Pioneers Ltd. All rights reserved.

M-Systems, DiskOnChip, DiskOnChip Millennium, DiskOnKey, DiskOnKey MyKey, FFD, Fly-By, iDiskOnChip, iDOC, mDiskOnChip, mDOC, Mobile DiskOnChip, Smart DiskOnKey, SmartCaps, SuperMAP, TrueFFS, uDiskOnChip, uDOC, and Xkey are trademarks or registered trademarks of M-Systems Flash Disk Pioneers, Ltd. Other product names or service marks mentioned herein may be trademarks or registered trademarks of their respective owners and are hereby acknowledged. All specifications are subject to change without prior notice.