# IBM CUSTOMER INSTALLATION INSTRUCTIONS

## FBM 18P6634

## FFBM. Update IBM 3580 or 3581 Tape Drive Firmware using SCSI or a Field Microcode Replacement (FMR) tape.

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**Status:** Field Use

# Before Installation

## 1.0 Machines Affected:

This FBM affects the following IBM products:

- IBM 3580 model L11
- IBM 3580 model H11
- IBM 3581 model L17
- IBM 3581 model H17

when the tape drive in these products has firmware version below 25D4.

The contents of this FBM are as follows:

- 18P6634 - FBM (ECA014)
  - 19P6181 - 1 CD - with drive microcode (25D4)
  - 19P6167 - 1 diskette - with drive microcode (25D4)
  - 19P6184 - 1 FMR tape - with drive firmware (25D4)
  - 18P6437 - Installation Instructions

## 2.0 Purpose and Description

**Note:** Provided with these instructions is media containing drive firmware at the version recommended for all 3580 or 3581 machines. IBM recommends that you visit the LTO web site at **http://www.ibm.com/storage/lto** periodically to ensure your machines are always at the latest available version, and that you download the latest version and install it on your machine if they are not. You will find the firmware versions in the Technical Support section of the web site.

Listed below are the release or fix notes for the 25D4 version of drive firmware.

**Fixes incorporated into firmware release 25D4 from 1550:**

Most fixes are the result of IBM internal testing and are categorized below. Problems reported by drive users are listed individually.

**Defect/Error Processing** 24 fixes
**Reporting** 13 fixes
**Multi Initiator** 6 fixes
**Wrap Change operation** 7 fixes
**Support for new DRAM** 1 change

1. This code version adds support for a new DRAM on the drive card. Drives with this new DRAM require this support, so never downlevel any drive that originally came with drive firmware version 25D4 or higher to any version of drive firmware lower than 25D4.
2. Drive returns Check Condition if it receives CDB which has a non 0 in the LUN# field. Change not to check LUN field in CDB.
3. 16E0 firmware had a problem that occasionally resulted in corrupted CM and incorrect WRITE PASS values. Later firmware versions could still have a problem reading the tapes that had this original problem since we read ahead and might see an old dataset beyond EOD with a write pass value that could hang the drive. Checking is added to deal with this odd event appropriately.
4. If read request length is nearly 16MB, the residual length is not correct. Corrected the code so that it added an offset into residual length.
5. Conversion rule for serial number reporting between SCSI Inquiry and label on the drive was requested. Modified conversion rule for the serial number in SCSI Inquiry. The returned serial number will be consistent with the label on drive. The change in reporting methodology only effects new drives.

6. Drive did not handle invalid parameter list for Log Sense command. Firmware changed to return Check Condition with proper sense.
7. Default setting for Data Set Separator detection criteria was the same for READ operation as for WRITE operation. The criteria should be less stringent for the read operation. Change the setting of READ criteria to be less than WRITE.
8. A bug in the firmware caused a single-character display "A" error to occur when trying to locate to a very large record that spans several recorded datasets. The error window occurs when one or more small records and the beginning of a very large record occur in the same-recorded dataset.
9. Firmware fix **to avoid unintended overwrite condition that may occur when** appending data using certain software applications: If a tape had been written so that an "end of data mark" is at the beginning or end of tape, and an application appends new data after a SCSI read command rather than a SCSI space or locate command, a potential **unintended** data overwrite condition can occur. Note: This problem has **not been observed** with Veritas NetBackup or Veritas Backup Exec.
10. Interrupted read transfer causes misposition. Firmware version 1CS0 correctly reported good status when a read data transfer was interrupted by a SCSI bus error, or a SCSI command from another host. This results in the wrong length of data being sent to the host, repeated data sent to the host, or, if a write command was issued after the read, could result in overwriting data on tape.
11. The maximum REQ/ACK offset was lowered from 0x1F to 0x0F to resolve timing problems seen in cases of long SCSI buses or slow host bus adapters
12. Improved servo error handling at beginning and end of tape
13. Firmware has improved read recovery to prevent unintentional rewind.
14. Check for cartridge loaded and CM data present before servicing request for capacity log data
15. Added EOP bit in Read Position support
16. Enhancement to handle CM corruption
17. Drive invalidation of buffered data to force a physical read retry
18. New function for midtape recovery performance.
19. Fix to clear the internal logged error when it finds the target. "Maint Status Good" will be returned for all "drive offline" commands
20. Drive no longer hangs after a request for 0xD0 page
21. Added support for "tape System Area Write Failure" Tape Alert (52)
22. Added power on time to log page 0x0C
23. Added Universal Cleaning Cartridge Support
24. Read Buffer command with buffer ID 7 now returns the last 10 commands and Initiator ID, command execution status and associated sense data (if any).
25. Firmware now optimized for handling SCSI bus integrity problems
26. Fixed error recovery procedure hang during locate.
27. Fixed long delay (>45 seconds) on first load after power on.
28. Improved handling of medium error 03/3B/00 (sequential positioning error) during write.
29. No Tape Alert reported for expired cleaning cartridge.
30. Incorrect Volser reported in sense data.
31. Space filemark for condition when read operation attempts to read over EOD
32. Firmware error (SCD "3") reported on Space operation
33. Fixed problem that occasionally left CM (Cartridge Memory) in an open state and reported a "6" on the single character display.

Problem was introduced in firmware version 1550.

34. Improved the synchronization of data during compression optimization. Failure to maintain proper synchronization could result in lost or incorrect data that is undetected by a user.
35. SCSI hang during read operation.
36. Additional checking circuit for detection of error condition in the case of overlength or underlength reads.
37. Possible locate problem due to an incorrect memory pointer

# 3.0 Installation Time (Average)

Total time for the drive firmware update will be approximately 1/2 hour for either 3580 or 3581.

# Installation

## 4.0 Details Of Installation - 3580 only

To update code on a 3581, go to 5.0, “Details Of Installation - 3581 only” on page 9.

### 4.1 Determine the Drive Firmware Version - 3580 only

**Attention:** Before you continue, make sure that no tape cartridge is in the drive, and that the host server is not using the 3580.

To determine the version of drive code using the 3580 display, start by turning off power to the drive. Then turn on power to the drive and observe the display on the front of the drive. The first three digits of the drive firmware version will be displayed for approximately five seconds.

- If the drive firmware version is lower than 25D (such as firmware version 22U) then you should install the new drive firmware included with this kit. Go to 4.2, “Update Drive Firmware - 3580 Only” on page 6.
- If the drive firmware is already at 25D or higher do not continue with these instructions - the drive firmware has already been updated.

**Note:** In most cases the host server provides alternate methods of determining the Inquiry information - including the code version - of attached SCSI devices. These methods (such as TapeUtil or NTUtil) may be used if you are familiar with them, but they are not covered in these instructions.

## 4.2 Update Drive Firmware - 3580 Only

**Attention:** When updating drive firmware, do not power-off the 3580 Tape Drive until after the update is complete or the drive may become unusable.

To update code using SCSI, go to 4.2.1, “Update Drive Firmware using SCSI - 3580 Only.”

To update code using an FMR tape, go to 4.2.2, “Update Drive Firmware using an FMR tape - 3580 Only” on page 7.

### 4.2.1 Update Drive Firmware using SCSI - 3580 Only

Use the following information to assist you in downloading drive firmware from your server (host system) over the SCSI bus using the device drivers and utilities supplied by IBM.

For instructions on using the IBM device drivers and utilities (NTUTIL or TAPEUTIL), refer to the *IBM Ultrium Device Drivers Installation and User's Guide* that was shipped with the library. For the latest version of the User's Guide, visit the web at http://www.ibm.com/storage/lto.

For additional instructions on using NTUTIL and TAPEUTIL to update firmware over the SCSI bus, visit the web at http://www.ibm.com/storage/lto, then do the following:

- Under **Need More Information?**
  - Click on: **Technical Support**.
- Under **Products**
  - Choose the: **3580 Ultrium Tape Drive**.
- Under **Downloads**
  - Click on **Firmware**.
- Click on **IBM 3580 Ultrium Tape Drive Firmware**.
- Under **Downloadable Files**
  - Click on **Updating IBM Ultrium Tape Device Firmware (FMR)**.
  - Follow the instruction provided on the web page.

**Note:** It may be necessary to disable or remove a device driver supplied with a commercial backup application before using the device driver and utilities supplied by IBM. Refer to the *IBM Ultrium Device Drivers Installation and User's Guide* and the documentation provided with your backup application software to determine if there are conflicts.

After installing new firmware, verify the installation by using the inquiry command available on the utilities menu of your server, or observe the 3580 display on a power off/on cycle (see section 4.1, “Determine the Drive Firmware Version - 3580 only” on page 5).

**Note:** Some backup application software packages will not reflect the firmware change until the registry is refreshed by rebooting the server.

## 4.2.2 Update Drive Firmware using an FMR tape - 3580 Only

__ 1. Locate the FMR tape provided with this kit. Do not load it into the tape drive at this time, but have it ready to load later in this procedure.

__ 2. Make sure that the host application is not using the tape drive.

__ 3. Make sure that no tape cartridge is in the drive.

__ 4. Make sure that the following message appears on the message display (you may need to turn the power off, then on again for the message to appear):

```
Ultrium Tape Drive
Drive Empty
```

__ 5. In the following step you will put the drive into maintenance mode. While the drive is in maintenance mode, as soon as each step is completed you must perform the next step. If you do not perform the next step within 60 seconds the drive will automatically exit from maintenance mode. If this occurs, go to 6 and start again.

__ 6. Press the unload button 3 times within one second. The Single-character Display (SCD) should change to '0' and the following message should be displayed:

```
Maint Mode - Select
Exit Maint Mode
```

**Note:** If the SCD does not show '0', wait a few seconds and try again.

__ 7. Press the unload button two times. The SCD should change to **2** and the following message should be displayed:

```
Maint Mode - Select
Update Drive FW
```

**Note:** If you cycle past the desired code, press the unload button again to cycle to the next selection, and repeat until the SCD changes back to '2'.

__ 8. Press and hold the unload button for 3 seconds. The SCD should change to **C** and the following message should display:

```
Update Drive FW
Load Drv FMR Tape
```

__ 9. Insert the FMR tape into the drive. The SCD should change to **2** and the following messages should display:

```
Update Drive FW
Tape Loading ===>
```

followed by:

```
Update Drive FW
Reading ===>
```

followed by:

```
Update Drive FW
Completed!
```

followed by:

```
Cartridge Unloading
In Progress
```

followed by:

```
Ultrium Tape Drive
Drive Empty
```

**Note:** During the above sequence the drive loads the FMR tape, reads the new firmware image from the tape, and stores the new firmware image into the drive. It then rewinds the FMR tape, unloads it, and resets to activate the new firmware.

__ 10. Verify that the firmware update completed successfully by checking the drive firmware version as described in 4.1, “Determine the Drive Firmware Version - 3580 only” on page 5.

- If the drive firmware version is 25D or higher, the firmware update completed successfully.
- If the drive firmware version is still lower than 25D, the firmware update failed. Retry the firmware update. If the error continues, contact your IBM Service representative.

# 5.0 Details Of Installation - 3581 only

To update code on a 3580, go to 4.0, “Details Of Installation - 3580 only” on page 5

## 5.1 Determine the Drive Firmware Level - 3581 only

**Attention:** Before you continue, make sure that no tape cartridge is in the drive, and that the host server is not using the 3581.

To determine the version of drive firmware using the 3581 display, perform the following steps:

**Note:** In most cases the host server provides alternate methods of determining the Inquiry information - including the code version - of attached SCSI devices. These methods may be used if you are familiar with them, but they are not covered in these instructions.

__ 1. The message display should show **LdR READY** (if the autloader is configured for RANDOM mode) or **SEQ READY** (if the autoloader is configured for SEQUENTIAL mode). If it does not show one of these READY messages, turn off power to the 3581, then turn on power to the 3581 and wait for the power on sequence to complete.

__ 2. Press the NEXT button. While continuing to hold the NEXT button, also press the MODE button, and hold both buttons for 5 seconds. The message display should show **dIAG MENU**

**Note:** If the message display does NOT show **dIAG MENU**, wait a few seconds then try again.

__ 3. Press the MODE button to scroll through the diagnostic menu tasks until the message display shows **dSP FW**. This menu item is used to display the firmware version of the drive and the autoloader.

**Note:** If you scroll past the **dSP FS** menu item just continue to press the MODE button until the menu cycles back to it.

__ 4. Press the SELECT button. The message display should show **dSP LdR FW**

__ 5. Press the NEXT button. The message display should show **dSP dRV FW**.

__ 6. Press the SELECT button. The message display should show **dR FW NNNN** (where NNNN is the version number of the drive firmware).

__ 7. Record the drive firmware version in the following space for use later in this procedure._____

__ 8. Press the SELECT button. The message display should show **LdR READY** or **SEQ READY**.

__ 9. If the drive firmware version is lower than 25D4 (such as firmware version 22UD) then you should install the new drive firmware included with this kit. Go to 5.1.1, “Update Drive Firmware” on page 10.

__ 10. If the drive firmware is already at 25D4 or higher do not continue with these instructions - the drive firmware has already been updated.

## 5.1.1 Update Drive Firmware

**Attention:** When updating drive firmware, do not power-off the 3581 Tape Drive until after the update is complete or the drive may become unusable.

To update code using SCSI, go to 5.1.2, “Update Drive Firmware using SCSI - 3581 Only.”

To update code using an FMR tape, go to 5.1.3, “Update Drive Firmware using an FMR tape - 3581 Only” on page 11.

## 5.1.2 Update Drive Firmware using SCSI - 3581 Only

Use the following information to assist you in downloading drive firmware from your server (host system) over the SCSI bus using the device drivers and utilities supplied by IBM.

For instructions on using the IBM device drivers and utilities (NTUTIL or TAPEUTIL), refer to the *IBM Ultrium Device Drivers Installation and User's Guide* that was shipped with the library. For the latest version of the User's Guide, visit the web at http://www.ibm.com/storage/lto.

For additional instructions on using NTUTIL and TAPEUTIL to update firmware over the SCSI bus, visit the web at http://www.ibm.com/storage/lto, then do the following:

- Under **Need More Information?**
  - Click on: **Technical Support**.
- Under **Products**
  - Choose the: **3581 Ultrium Tape Autoloader**.
- Under **Downloads**
  - Click on **Firmware**.
- Click on **IBM 3581 Tape Autloader Firmware**.
- Under **Downloadable Files**
  - Click on **Updating IBM Ultrium Tape Device Firmware**.
  - Follow the instruction provided on the web page.

**Note:** It may be necessary to disable or remove a device driver supplied with a commercial backup application before using the device driver and utilities supplied by IBM. Refer to the *IBM Ultrium Device Drivers Installation and User's Guide* and the documentation provided with your backup application software to determine if there are conflicts.

After installing new firmware, verify the installation by using the inquiry command available on the utilities menu of your server, or by using the 3581 diagnostic menu (see section 5.1, “Determine the Drive Firmware Level - 3581 only” on page 9).

**Note:** Some backup application software packages will not reflect the firmware change until the registry is refreshed by rebooting the server.

## 5.1.3 Update Drive Firmware using an FMR tape - 3581 Only

__ 1. Locate the FMR tape provided with this kit. Do not load it into the tape drive at this time, but have it ready to load later in this procedure.

__ 2. Make sure that the host application is not using the tape drive.

__ 3. Make sure that no tape cartridge is in the drive.

__ 4. The message display should show **LdR READY** (if the autloader is configured for RANDOM mode) or **SEQ READY** (if the autoloader is configured for SEQUENTIAL mode). If it does not show one of these READY messages, turn off power to the 3581, then turn on power to the 3581 and wait for the power on sequence to complete.

__ 5. Press the NEXT button. While continuing to hold the NEXT button, also press the MODE button, and hold both buttons for 5 seconds. The message display should show **dIAG MENU**

**Note:** If the message display does NOT show **dIAG MENU**, wait a few seconds then try again.

__ 6. Press the MODE button to scroll through the diagnostic menu tasks until the message display shows **UPG dRV FW**. This menu item is used to update drive firmware using an FMR tape.

**Note:** If you scroll past the **UPG dRV FW** menu item just continue to press the MODE button until the menu cycles back to it.

__ 7. Press the SELECT button. The message display should show **Ld FMR 2**

__ 8. Insert the FMR tape into slot 2, then press SELECT. A series of messages will display as the FMR tape is moved into the drive, then the message display should show **READING FW**.

__ 9. When the update process is completed, the autoloader unloads the tape and returns it to storage slot 2. **RMV SLOT 2** blinks on the message display.

__ 10. Remove the FMR tape from slot 2, then press SELECT. **LdR READY** displays.

__ 11. Allow at least three minutes for the drive to reset and activate the new firmware.

**Note:** If **dRIVE PGRM** and error indicator E appear on the message display this indicates that an error occurred while updating the drive firmware. Verify that you loaded the correct FMR tape, then go back to 5.1.1, “Update Drive Firmware” on page 10 and repeat the update process. If the problem persists, contact your IBM Service Representative.

__ 12. Verify that the firmware update completed successfully by checking the drive firmware version as described in 5.1, “Determine the Drive Firmware Level - 3581 only” on page 9.

- If the drive firmware version is 25D4 or higher, the firmware update completed successfully.
- If the drive firmware version is still lower than 25D4, the firmware update failed. Retry the firmware update. If the error continues, contact your IBM Service representative.