

Microsoft MS-DOS CD-ROM Extensions Version 2.21

TESTDRV Test Utility

TESTDRV is a rigorous test utility for CD-ROM device drivers to verify that the drivers adhere to specifications. This driver test attempts to fully exercise all possible calls to the device driver and record the driver's progress.

Setup for TESTDRV

TESTDRV assumes that MSCDEX and the appropriate device driver are installed. During initialization, TESTDRV reads the driver profile from the file TESTDRV.PRO which assigns the device status defaults for the test. The following example shows a typical TESTDRV.PRO file:

```
;          This          is          a          sample          TESTDRV.PRO
;  Comments  start  with  ';'  and  continue  to  the  newline
DriverName   = MSCD000    ;  The  driver  to  test  (specified
                           ;  as  argument  to  the
                           ;  <drivername>.SYS  command  line
WriteDevice  = f          ;  This  device  is  not  writable
Redbook      = t          ;  This  device  supports  Redbook
                           ;  Addressing
RawMode      = t          ;  This  device  supports  raw
                           ;  mode  data
Prefetch     = t          ;  This  device  supports
                           ;  prefetching
AudioControl = t          ;  This  device  supports  audio
                           ;  channel  manipulation
Audio        = t          ;  This  device  supports
                           ;  audio/video  information
AudioChannels = 2         ;  Number  of  supported  audio
                           ;  channels
Interleave   = f          ;  This  device  does  not  support
                           ;  Interleave  mode
InterleaveSize = 0        ;  Interleave  size  (may  range
                           ;  between  0-255)
InterleaveSkip = 0        ;  Interleave  skip  (may  range
                           ;  between  0-255)
Eject        = t          ;  This  device  supports  software
                           ;  eject  requests
UPC          = t          ;  This  device  implements  UPC  code
                           ;  reading
Output       = HEXDUMP.TXT ;  Output  hex  dumps  to  this  file.
                           ;  Blank  assignment  sends  output
                           ;  to  stdout
RedReadSectors = 3:8:3,8:2:4 ;  List  of  sectors  to  read  in
                           ;  ReadL  tests  (Redbook  form)
HSGReadSectors = 0024180c,00ff3421 ;  List  of  sectors  to  read
                           ;  in  ReadL  tests  (HSG  form)  hex
                           ;  only
;  <EOF>
```

If the profile variables are not set in the TESTDRV.PRO file, they will default to the values shown above (except for the sector selections).

Running TESTDRV

To run the test simply install your device driver, initiate MSCDEX, and execute TESTDRV.EXE. The default operation of TESTDRV can be modified through command line flags and arguments. Either a hyphen (-) or a forward slash (/) denotes the flags. The following command line flags and arguments are available:

filename Alternate driver profile. (default: TESTDRV.PRO)

/A Attended operation, qualifying interactive tests. (default: unattended operation)

/I Override disk recognition on control disk. That is, behave as if the disk is unknown even if it is a member of the Test Set. (default: if recognized, several data matching tests are qualified).

/T Terse output, no hex dumps and fewer diagnostic messages.

/[#] Where # is a digit between 0 and 7, the drive number.

In unattended (default) mode, all tests will be verified by both successful completion, given an acceptable request, and successful error recovery, given an unacceptable request. The output has the following format:

```
[Command Code.Subcommand Code]  [Status]  [Command[:Subcommand]]:
[Test Comment]
```

For example, the test for the location of the driver head may return:

```
3:12  TESTING          IOCTLI:  QInfor:          BUSY:DONE:
3:1   TESTING          IOCTLI:LocHead:          BUSY:DONE:
      #1 Qinfo: Cntrl 1, Track 19, P/Index 1, Track Running Time
0:0:0
Disk           running          time:           47:35:0
Location of Head 47:35:0
```

Commands that return sector data or device dependent data will dump output in hexadecimal. If the disk is a recognized test disk and recognition is turned on (default), sector data will be compared to correct values and only the status returned.

Attended and Unattended Operation

Several calls to the driver cause or report physical changes in the drive unit or require that audio disk information be played through audio channels like conventional audio CD players. These states should be confirmed by an operator. A series of YES/NO queries and simple directions allow the operator to

quickly step through these tests. In order to allow for operator-free testing, a set of alternate best-guess tests can be executed instead of the ones that require confirmation. Attended testing is a super-set of unattended testing and should be considered the most complete run of the test program.

For example, the following sequence occurs in the attended mode:

```

132          TESTING          PlayReq:          BUSY:DONE:
Playing          track          from          47:35:0
          Can    you    hear    music    playing?    [Yncq]_
132          PlayReq: Request Completed Successfully.

```

For a successful sequence, music would play and the tester would respond with 'Y'.

Control Disk Verification

The test for verifying read data requires the Microsoft Bookshelf and Microsoft Programmer's Library to be used as control disks. The test procedure reads data from the control disks then compares both raw and cooked data for correspondence with archived data. If the test is run without the control disks, the data read is dumped in hexadecimal and ASCII format to the specified output.

Nonstandard CD-ROM Features

Several driver commands derive their results or actions from hardware dependent features of the driver. Since not all drivers can be supported in a general release, special features of a device driver may not be adequately tested. (For example, write commands apply to few CD-ROM drives and are only minimally supported by error recovery tests.) If the hardware dependent CD-ROM device driver document describes the results of a driver request as undefined, the request will be tested for simple completion and error recovery. Requests that return data will dump the data to the selected output in hexadecimal and readable ASCII format.

Other Tests For CD-ROM Drives

CD-ROM drives are a natural companion to multimedia applications. The performance of many multimedia applications is dependent on the rate that data is streamed from the CD-ROM. You can use the CDSPEED program described in the next chapter to test the data rate of CD-ROM drives.

As the user base and popularity of the Multimedia Extensions to Windows expands, the demand for compatible CD-ROM drives will increase. The MUSICBOX application provided with Windows with Multimedia 1.0 provides a good platform to test the operation of you CD-ROM drive and driver. In addition to identifying incompatible behavior between a CD-ROM driver and MUSICBOX, the following tests help verify that the CD-ROM drive can properly play Redbook audio.

1. Load Windows with Multimedia 1.0 on your system.

2. Start Windows.
3. If necessary, remove the disc from the CD-ROM drive.
4. Start MUSICBOX and observe the operation of the system.
Some drivers hang the system for a minute or more when MUSICBOX is started. The delay should be no more than a few seconds.
5. Put an audio CD in the CD-ROM drive with MUSICBOX going.
6. Seek to the next track with MUSICBOX and observe operation.
Some drivers do not support seek. Other drivers seek when playing but not when its stopped. Others seek when stopped but not when playing. Users expect the CD-ROM drive to seek when they are playing audio CDs.
7. Put MUSICBOX on repeat and make sure it repeats. Some drivers do not repeat.
8. Check that the status (time, track) is accurate.
Some drivers pass inaccurate information back to MUSICBOX.
9. Play to the end of the CD and let it stop.
Some drivers fail when they play to the end of a CD.