Penny & Giles – Product Support

Document Number	:	PS1231
Revision / Date	:	5 / August 22, 2011
Document Title	:	OQAR BAD MEDIA Message
Equipment Affected	:	OQAR
Part Numbers	:	D52000-XXXXX (All OQAR versions) D51556 & D51557
Classification	:	Information

1. Introduction.

This purpose of this document is to help the Optical Quick Access Recorder (OQAR) operator understand what causes the "BAD MEDIA" error message, answer questions relating to this message and advise what can be done to recover from this situation.

2. What should I do when the OQAR displays the "BAD MEDIA" message?

Remove and replace the optical disk currently in the OQAR with another disk that has been certified good.

WARNING : Should the OQAR prove to be faulty and therefore be the cause of the "BAD MEDIA" message, it should be understood by the operator that any optical disks removed from this faulty OQAR may have been 'damaged' by the OQAR resulting in their subsequent failure if they are inserted into other good OQAR.

Note. 1. Refer to the section titled 'What should I do with a "BAD MEDIA" disk?' for information on how to handle the suspect optical disk media.

3. Why does the OQAR display the "BAD MEDIA" error message?

The OQAR may indicate "BAD MEDIA" on the front panel Interactive Control/Display (ICD) when it is unable to access the optical disk for writing and reading purposes. This error message may be displayed for several reasons, however the three main reasons are:

a) Because of a failure of the magneto optical (MO) Drive unit used inside the OQAR, or

b) Because the disk itself has been "damaged" in another OQAR (with a faulty MO Drive) or by the use of an inappropriate disk ejection method, or

c) Because the disk (if new and previously unused) has not been Low-Level formatted before first use.

4. When will the OQAR display the "BAD MEDIA" error message?

The OQAR may display this message at the time that the disk is inserted into the OQAR or at some point in time after the disk has been inserted into the OQAR when the OQAR is unable to complete a reading or writing function.

5. What happens when a disk is inserted into the OQAR?

Before the optical disk can be used by the OQAR it must be accepted by the MO Drive and be acceptable to the OQAR software. When the disk is inserted into the OQAR, the MO Drive detects a disk insertion and then tries to 'mount' the DOS volume on the media. During this mounting process it reads and checks various areas of the media, i.e. Boot Block (1st sector specifying the DOS format parameters), FAT (File Allocation Table on the media) and Directory table.

If the MO Drive fails to correctly access the Boot Block or FAT it will report an error code to the OQAR via the SCSI bus and the OQAR will display the "BAD MEDIA" error message.

If the disk is successfully mounted then the OQAR attempts to read the last sector on the media as specified in the Boot Block, but if this sector is bad then the OQAR will fail causing the "BAD MEDIA" error message to be displayed. This error is undetectable using DOS tools such as Norton's Disk Doctor and Windows Scandisk, as this sector is out of the DOS range. The sector read is performed by an IFX call (File Executive software system that is part of the OQAR Real Time Operating system). To correct the problem with the media it has to be either low-level formatted or the sector in error re-mapped by a custom utility.

6. BAD Sector Check on media insertion

When a disk is inserted for the first time, the OQAR checks the FAT and directory tables for BAD sectors, if any sectors are found to be BAD the media is rejected by the OQAR (" BAD MEDIA \ PRESS EJECT ").

The failure of the MO Drive unit is the most likely cause of the Bad Media message. However when the MO Drive fails it can corrupt the optical disk so that it will report "BAD MEDIA" even when it is inserted into a 'good' OQAR. It is important to ensure that all optical disks that show "BAD MEDIA" are correctly formatted as detailed in 'high & low level formatting' below.

7. Is the media actually bad?

It is possible for the optical disk media data sector areas to be 'damaged' after being used in an OQAR (because of a failure of the MO Drive or incorrect disk removal), however it is also possible to correct this 'damage' by formatting the optical disk.

Imperfections and defects in the optical disk surface will typically not be corrected by formatting the optical media, however when there are a limited number of physically damaged sectors it is possible to map these out of the data area by using the appropriate software. Due to the relatively low cost of the optical media it is not recommended that the operators use this technique to correct for this problem.

8. What should I do with a "BAD MEDIA" disk?

When a disk has reported "BAD MEDIA" on the OQAR ICD then the disk should not be used in another OQAR until the disk has been evaluated and/or 'low-level' formatted.
In order to verify if the optical disk contains 'bad sectors' the operator may use the Scandisk software function of Windows 95/98/2000/NT – with the 'Thorough' option enabled.

Scandisk will evaluate all system and data sectors on the optical disk, and if enabled to do so, will attempt to recover or return the bad sectors and the disk to normal operation. Depending upon the capability of your hardware and the size of the optical media this process may take from 10 to 20 minutes to be completed. Formatting of the optical disk is detailed below.

9. High & low level formatting.

When the MO Drive in the OQAR fails it may result in some sectors of the optical disk being wrongly identified as bad - when in fact the sectors are good - but it is the drive that is faulty. In addition the failure of the MO Drive can result in the boot sector and file attributes table of the optical disk being corrupted making the disk unusable.

10. High level format.

High level formatting can be performed by using the format function in Windows 95/98/2000/NT. Typically a high level format will take 10 seconds to complete. This will **not** correct the bad sectors problem and will only cause the FAT to be re-written.

11. Low level format.

Low level formatting can be performed using the software provided by the MO Drive manufacturer, or by using the BIOS function of your SCSI card. The low level format will take between 10 to 20 minutes to format one disk. If you are using a Fujitsu DynaMO Optical Drive connected to your PC then you should also have received the DynaMO software from Fujitsu which you should install on your PC. This software will include a format option where you can perform a high level format and a low level format when you select a check box.

Note. 2. Please consult the software documentation supplied with your MO Drive for further details on how to use the formatting software.

If your SCSI card has a BIOS ROM fitted then when you boot up your PC you will see a message on the screen from the SCSI card indicating how you can access the BIOS functions. The Adaptec range of SCSI cards indicate that if you press CTRL+A you can enter the BIOS functions. These functions also include a low level format option.

WARNING : Take great care when using these SCSI Card BIOS functions because as well as allowing access to the MO Drive attached to your computer the BIOS functions will also allow format access to any SCSI hard drives attached to your computer.

Notes. 3. Please consult the BIOS function documentation supplied by your SCSI Card manufacturer/supplier for further details on how to use the BIOS functions.

4. After performing a low level format of the disk you should also perform a high level format.

12. What is the Event Log?

The OQAR includes an event monitoring system that will maintain a record of any optical disk accessing, reading and writing problems – called the event log. The event log is maintained in the FLASH memory of the OQAR and may be recovered from the OQAR and used to help analyse the nature of the failure experienced by the equipment.

A common failure mode of the MO Drive typically results in the MO Drive being unable to mount the disk when it is inserted or power is restored to the system and are reported as "Cannot Mount" event codes in the FLASH.ELF file.

Note 5. In software versions prior to release version 9.00, these "Cannot Mount" event codes would be generated every 3 or 4 seconds when the MO Drive had failed to mount the optical disk. The event log is limited to accumulating 8192 events before discarding the oldest to make room for new ones, therefore in less than 3 hours the entire event history for this OQAR – possibly going back many weeks or months – would be replaced by thousands of the same "Cannot Mount" event.

13. Why should I upgrade my OQAR to the latest software?

Version 9.00 (and later) software will only record 3 of these "Cannot Mount" events for each disk insertion and power cycle, thus preserving the operational event history file to assist in the appropriate fault or failure analysis process. The current OQAR software versions are 8 for the Resident (or Kernel) software code, and 12 for the Uploadable (or Application) software. This software has been developed with several features to help the OQAR cope with variations in the quality of the optical media and the possible failure of the MO Drive unit in the OQAR. More detail regarding these software versions are included in the Service Bulletins D52000-6XXXX-31-30 and D52000-4XXXX-31-25.

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