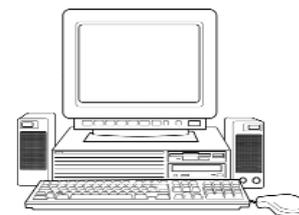


Optimising EUMETCast Reception using a RAM disk



(Updated December 2006 to include MetOp reception)

Arne van Belle - Co-ordinator, Radio Observers, Werkgroep Kunstmanen

EUMETSAT recommends the use of quite a powerful PC for the reception of *EUMETCast*, its DVB dissemination route for Meteosat-8 images and the many other data products that are now being transmitted using the Hot Bird 6 satellite. This is not without reason! From experiments it has become clear that a low-specification PC rapidly becomes overloaded and starts to lose image segments (horizontal segments of the picture remain blank).

After a thorough study of the complete reception process, experiments and discussions with David Taylor, I concluded that the hard disk is mainly to blame. By reserving part of the PC memory as a **RAMdisk**, and instructing the reception process to use this instead of the hard disk, you can receive *EUMETCast* using a much lower specification PC.

A clean installation of Windows 2000 (Service Pack 3 or higher) plus sufficient memory in your PC is a first requirement. Windows 98 and ME are not suitable. In these operating systems, the reception buffer is too small and it is this problem that causes many missing segments.

The RAMdisc approach also works with Windows XP, but tends to load the CPU and memory a bit more compared with Windows 2000, especially on older PCs where resources may be scarce.

Why Does a RAMdisk Help?

The *TelliCast* software uses a temporary file (called '0.fsy') to buffer the received data stream. All received data is 'dumped' directly into a database to keep up with the continuous stream. Only later is this database analysed and the data assembled into complete files. There is a separate file for each segment of image data.

From my experiments it has become clear that you can lose segments at times when there is a lot of activity on the hard-disk. At these moments, *TelliCast* is not able to access the database in the *0.fsy* file quickly enough and therefore loses some of the incoming data stream.

As a side-effect you may notice that, during bad reception conditions or when using a slow PC, the *0.fsy* file size increases rapidly. This is because the database is becoming clogged with incomplete data that could not be converted into files.

By telling *TelliCast* to maintain this database on RAMdisk you can drastically improve access times and so prevent data loss.

Tests have shown that the total time devoted to disk read/write operations (% Disk Time) decreases from 30% to 7% when *TelliCast* is using a RAMdisk instead of the hard disk. With the much higher data volumes resulting from MetOp I expect this figure to be much higher now. Should '% Disk Time' exceed 90%,

this would not bode well for the system. Remedial action such as the addition of additional hard drives would be needed. See:

http://www.wilsonmar.com/1perfmon.htm#O_Disk

Before using the RAMdisk I had to be very cautious when moving decoded images to my *GeoSatSignal* processing PC: I even had to lower my network transfer speed to 10 Mbit/s to prevent segment loss. But now I don't suffer from lost segments when moving an entire day's worth of images at 100 Mbit/s.

But you *do* need sufficient memory in the PC and to take care to limit tasks on it. Using 384 Mb of memory I can receive and decode all HRIT channels and FSD (GOES-W and GOES-E, the Americas; Meteosat-7, Indian Ocean; MTSAT-1R, Australasia) as well as run *MSG Animator* (although updating only one animation).

If you plan to receive Ears-AVHRR and MetOp Global data, make sure you have at least 512 MB RAM. For receiving and processing this data on a single PC use at least 1024 MB of RAM.

Also, disable all other tasks like virus scanner, screensaver, automatic updates etc. to free up as much memory as possible. But never use an unprotected PC to perform downloads from the Internet.

Adapting Your EUMETCast PC to run with RAMdisk

I assume that you already have the *Skystar2* DVB card, *TelliCast* software and the ECU installed on this PC. Download the *RAMdisk* software (just 93 kb) from:

<http://tech.groups.yahoo.com/group/MSG-1/files/>

by following the link: => **AR-Soft-RAMdisk.zip**

Please note that you **must** be a member of the MSG-1 Yahoo group to access this file. Group membership is free and unrestricted.

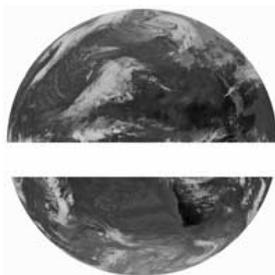
RAMdisk is a free program suitable for Windows NT, Windows 2000 and Windows XP. Install your RAM disk, by double-clicking on the *RAMdisk* setup.exe file.

- Go to Start, Settings, Control Panel and double-click the 'RAM disk' icon
- Set the drive letter to 'Z:' and click on the 'Geometry' tab
- Set 'Disk size' using the slider or arrow keys left/right

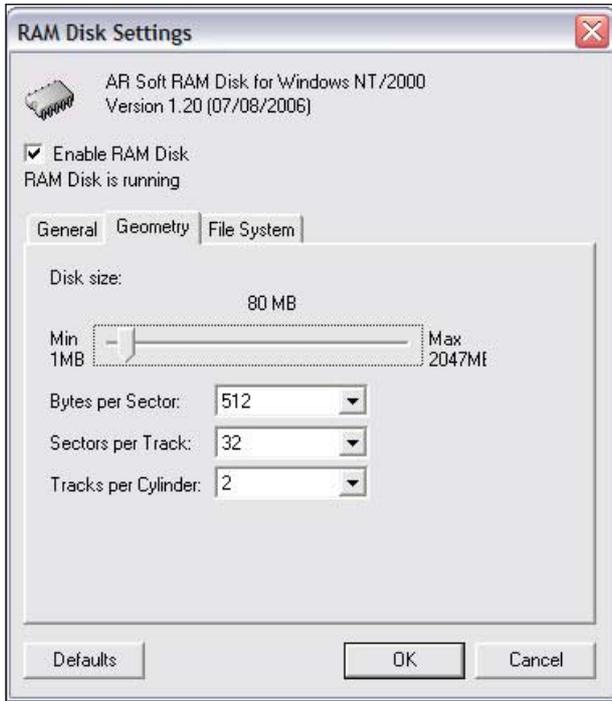
Recommended RAM Disk size are:

- MSG only - 30 MB
- MSG + EARS-AVHRR - 40 MB
- MSG + EARS-AVHRR + EPS-global - 80..130 MB
- All PID's and Data channels - 250 to 500 MB

Windows XP users must change *System Restore* settings to exclude the RAMdisk; see Geo Quarterly No 11 page 39.



A Meteorosat-8 channel-9 IR image illustrating a missing segment
© EUMETSAT 2005



Setting the size of the RAMdisc

Now Reboot the PC

Next, make a backup of the folder:

C:\Program Files\T-Systems\BusinessTV-IP

called

C:\Program Files\T-Systems\BusinessTV-IP-backup

If you are using an older setup you will find all the files in a folder named folder **C:\TelliQue** but the changes mentioned below are the same.

Edit the file 'recv.ini'

- Change 'log_file_number = 30' to 'log_file_number = 2'
- Change also 'log_level = normal' to 'log_level = quiet'

These changes ensure that *TelliCast* does less logging and causes less hard disk access. A side effect is that you will only see errors in the log, not the normal messages.

Under [locations] add the line below

file_database_directory=Z:\receiving

This entry instructs *TelliCast* to place the *0.fsy* file on the RAMdisk, in the 'receiving' folder, and not on the hard disk.

Under [parameters] add the line below

(If this line already exists, then only change the number)

file_database_size = 83 000 000

Note: the spaces are only shown to make the number clearer: enter it without spaces, as '83000000'.

This ensures that the *0.fsy* file cannot overflow the RAMdisk.

You need to restart *TelliCast* to make these changes effective. *TelliCast* will create a file called '*0.fsy*' in 'Z:\receiving\'. Within a couple of minutes data should be coming in again.

Points to watch during first week running with RAMdisk

The free space on Drive Z: should never be less than 1 MB; if necessary increase the RAM disk size a bit.

Check Task Manager, Performance and 'Memory usage' regularly. The average over a day should be below the total amount of physical memory. A temporary peak can be handled by paging to hard disk but excessive paging will lead to segment loss. If necessary free up memory by de-selecting channels in *MSG Data Manager* or installing more RAM.

Normally the hard disk LED will light up regularly in short bursts. But if the LED lights up almost continuously for several minutes the load on the disk might be too high.

You should be aware that older hard disks not only have a smaller capacity but also have a lower transfer rate. Replacing an older hard drive by a more modern one with 7200 rpm and an 8 Mb buffer can improve the overall performance of an older PC considerably. But be careful with large hard disks (over 40 GB). Check in your motherboard manual about using large hard disks as to use them you may need to upgrade your BIOS.

Footnote

There may be limits on the size of a RAMdisk using the free ARSoft *RAMdisk* product. I have known a 75 MB RAMdisk allowed in a 512 MB Windows 2000 system, a 132 MB RAM disk on a 1 GB system and a 300MB RAMdisk in a 2GB one.

If you set higher sizes on the above systems, the ARSoft program does run but the RAMdisk turns out to be smaller than configured. If you set the size of RAM disk excessively high, there will be no RAMdisk loaded at all. You can see this as an error in the Event Viewer.

This article originally appeared (in Dutch) in the December 2004 issue of **De Kunstmaan** under the title: 'Optimalisatie van EUMETCast Ontbangst d.m.v. een Ramdisk'. De Kunstmaan is the magazine of Werkgroep Kunstmanen

<http://www.kunstmanen.nl>

This reprint in English appeared in the June 2005 issue of **GEO Quarterly**, the magazine of the Group for Earth Observation (GEO).

<http://www.geo-web.uk>

