

UPDATE ON EUMETCAST

This Working Paper provides information on the products and services distributed via the EUMETCast System operated by EUMETSAT. Further developments, to prepare for the distribution of Metop global data and products, are briefly described.

CGMS Members are invited to take note.

UPDATE ON EUMETCAST

1 INTRODUCTION

Since the start of EUMETCast broadcast services late 2002, there has been a rapid and significant evolution of the system over recent years. In June 2004 there was an increase of EARS/RSS channel bandwidth to 300 Kbps. In July 2004 the dissemination of the 2nd OSI SAF (France) product “Merged Atlantic Product - Sea Surface Temperature” (MAP-SST). In August 2004 there was a change of Ku-band transponder on Hotbird-6. In October 2004 improved timeliness for Met-5 and Met-7 image segments was achieved. November 2004 saw the start of trial dissemination (3 times per month) of the “Vegetation Index Product” (S10DVI) for African Users, and provided by VITO (Belgium). In January 2005 there was the first end-to-end test (adding 8 Mbps) to simulate the provision of EPS Global Data to meteorological services, with a total system data rate of 12 Mbps.

2 OVERVIEW OF UPLINK & TURN-AROUND SERVICE

Commercial digital TV geostationary satellites are used for data reception and transmission. The Up-link service satellite is Hotbird-6, located at 13 degree East and a Ku-Band transponder is used.

For the turn-around service, Atlantic Bird-3 is used, located at 5 degree West, where a C-Band transponder used.

It will be recalled that the coverage of the two services is as follows:

EUMETCast Ku-Band Coverage

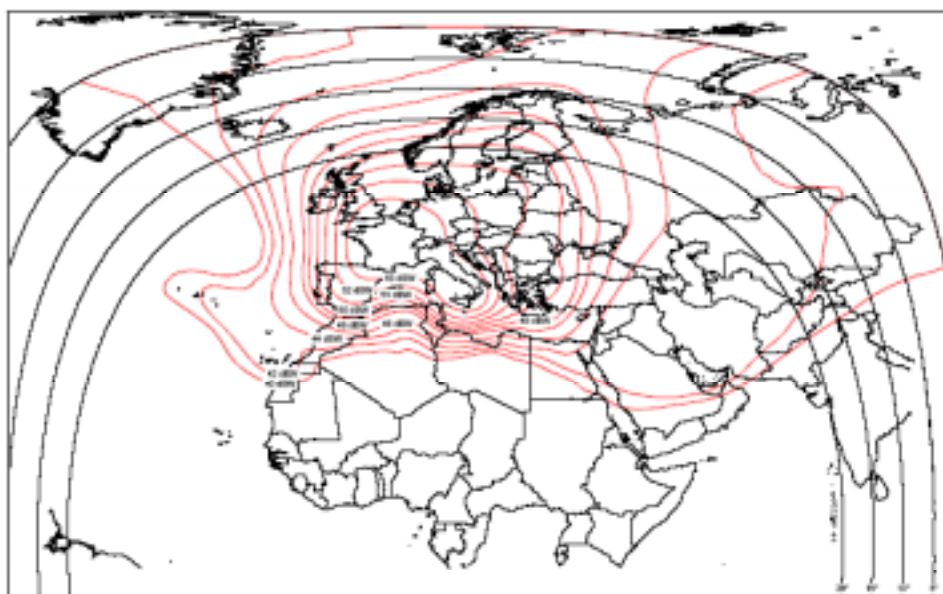
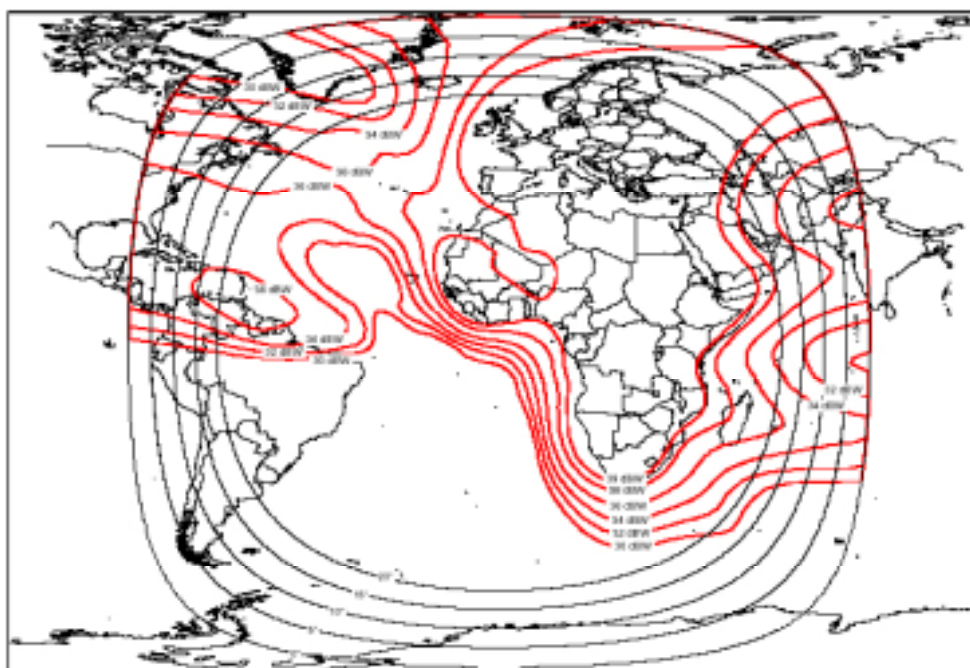


Figure 15. HOT BIRD™ 6 Ku-band Transmitt Coverage

EUMETCast C-Band Coverage



3 CURRENT SERVICES AND AVERAGE DAILY DATA RATE (KBPS)

- High Rate SEVIRI Image Data - data from Meteosat-8 (710)
- Low Rate SEVIRI Image Data - data from Meteosat-8 (15)
- Rapid Scanning Service (RSS) - data from Meteosat-6 (48)
- High Resolution Image (HRI) - data from Meteosat-7 (40)
- Indian Ocean Data Coverage (IODC) - data from Meteosat-5 (42)
- EUMETSAT ATOVS Retransmission Service (EARS) (30)
- Foreign Satellite Data (FSD)-data from GOES-n (MTSAT1-R to come) (14)
- Data Collection and Retransmission (DCP) (7)
- Meteorological Data Dissemination (MDD) (4)
- Meteorological Products from MSG MPEF (39)
- Meteorological Products from Satellite Application Facilities (55)
- DWDSAT (190)
- Basic Meteorological Data (BMD) for WMO RA VI (10)
- Vegetation Product (3 times per month) (3)

4 CURRENT ALLOCATON OF SERVICES TO CHANNELS

PID	Multicast Channel	Services	Bandwidth
500	Channel 1	EARS & Rapid Scan Service	0.300 Mbps
	BMD-RAVI	Basic Meteorological Data for WMO RA VI	0.064 Kbps
	SAF-Europe	Land SAF European Products OSI SAF KNMI Surface Wind Product	0.064 Kbps
300	Channel 2	High Rate SEVIRI (all 12 spectral channels)	1.420 Mbps
301	Channel 3	Low Rate SEVIRI: (IR_016, IR_039, IR_108, VIS006, WV_062) Meteosat-5 HRI (IODC) Meteosat-7 HRI Foreign Satellite Data: (GOES-9/MTSAT, GOES-10, GOES-12) Meteorological Products from MSG MPEF SAF Products (OSI SAF and non European Land SAF Products) DCP MDD Vegetation Product S10NDVI	0.338 Mbps
302	DWDSAT	DWDSAT	1.536 Mbps

- Channels 2 & 3 are fed into the C-Band turn around service

5 BANDWIDTH MANAGEMENT AND SERVICE DIRECTORIES

The data on each channel is transmitted within the constraints of the bandwidth of the respective channel. Within a channel, priorities can be assigned.

Data for each channel is provided via “Service Directories”, where one or more Service Directories are allocated to one channel. Service Directories are implemented on the uplink server. Associated with each Service Directory is a distribution list (users entitled to receive the respective products) and an allocation of bandwidth characteristics. Data Providers transfer their data directly into the Service Directories.

Each data provider is responsible for monitoring his own data. EUMETSAT monitors the end to end service for the data provided by EUMETSAT. EUMETSAT also supports the service monitoring of external data providers, upon request. Each service provider (up-link and turnaround services) is responsible for monitoring its complete service.

6 ENCRYPTION AND DECRYPTION

It will be recalled that encryption is implemented to allow the independent targeting of files towards a single user or group of users. It also enables secure control of access at individual file & user level and is implemented in accordance with EUMETSAT’s data policy using the tq-tellicast server S/W.

It is based upon the Blowfish algorithm (symmetric 128 bit data keys) and is carried out in the EUMETCast uplink server.

Decryption is carried out by the tq-tellicast client S/W in combination with a decryption device called a EUMETCast Key Unit (EKU) and the supporting EKU S/W package. The EKU is a USB device and is used in conjunction with a corresponding username and a user_key/password to enable decryption of licensed (encrypted) services. Only data described as “essential” by WMO can be decrypted without an EKU. The EKUs are distributed by EUMETSAT to registered users.

7 CURRENTLY LICENSED SERVICES

	¼ - hourly 23:45, 00:00, 00:15, ...	½ - hourly 23:45, 00:15, 00:45, ... <i>00:00, 00:30, 01:00, ...</i>	1 - hourly 23:45, 00:45 01:45, ... <i>00:00, 01:00, 02:00, ...</i>	3 - hourly 23:45, 02:45 05:45, ... <i>00:00, 03:00, 06:00, ...</i>	10 minutes <i>00:10, 00:20, 00:30, ...</i>	All formats
High Rate SEVIRI	x	x	x	x		
Low Rate SEVIRI		x	x	x		
HRI from Met-5 & Met-7		x	x	x		
Rapid Scan. Met-6					x	
MDD						x
DWDSAT						x
Vegetation Pr. S10NDVI						x
BMD for WMO RA VI						x

Start of repeat cycle time for SEVIRI data formats (upper row)

Repeat cycle end time for Met-5/6/7 (*lower row, italic*)

Licensing Agent not EUMETSAT for DWDSAT, S10NDVI and RA VI Data

8 CURRENT WMO “ESSENTIAL” SERVICES

	3 - hourly 00:00, 03:00, 06:00, ...	6 – hourly 23:45, 05:45, 11:45, 17:45	6 – hourly 00:00, 06:00, 12:00, 18:00	All formats
High Rate SEVIRI		x		
Low Rate SEVIRI		x		
HRI from Met-5 & Met-7			x	
Foreign Satellite Data	x			
DCP Messages				x
Meteorological (incl. SAFs) Products				x
EARS	4			x

9 EUMETCAST SERVICE AVAILABILILTY

	Ku-Band	C-Band	Perfect RCs
Feb-05	99.97 %	99.75 %	98.98 %
Mar-05	100.0 %	99.28 %	99.32 %
Apr-05	99.96 %	100.0 %	99.27 %
May-05	99.99 %	99.99 %	99.26 %
Jun-05	99.90 %	99.99 %	99.35 %
Jul-05	99.94 %	100.0 %	99.10 %

For the Ku-Band service, the calculation is based on the ratio of the number of successfully (and timely) received files on Reference Reception Stations versus the number of files transferred to the Ku-Band up-link station.

For C-Band, the ratio of the number of successfully (and also timely) received files on C-Band Reference Reception Stations versus the number of successfully received files on the Ku-Band Reception Stations at the C-band up-link site is taken.

The number of perfectly received Meteosat-8 High Rate Repeat Cycles (RC) per month (with the Reference Stations at the MCC) is calculated against the number of scheduled Repeat Cycles. In this calculation, a full High Rate RC consisting of 114 image segments is counted as lost if only one (or more) of these segments was not successfully received or was not meeting its reception timeliness requirement of 5 minutes.

10 EUMETSAT COVERAGE OF SOUTH AMERICA

South America remains the most significant imaged area, to which Meteosat-8 data is not disseminated, particularly Brazil, with similar viewing angles as Spain and Portugal. Whilst the MSG-2 (to become Meteosat-9 once operational) LRIT data will be available to South America, it is not suitable for quantitative applications (i.e. only half-hourly, 5 out of 11 channels, no HRV, lossy compression). However, the EUMETSAT Council endorsed the setting up of a EUMETCast South America service. This will be a Pilot service of 3 years. An ITT was issued at the beginning of August 2005, aiming for a start of this service in January 2006.

The service will, again, be based upon DVB turn-around, like the C-Band Africa service, with up-link from Europe. Only one High Rate channel of 2.1 Mbps, Ku-Band or C-Band will be used. Service provision will either come from satellite operators such as Eutelsat, Hispasat, NewSkies, Panamsat, or from capacity resellers such as Telespazio, T-Systems or Globecast. There will be User administration, as for the European Ku- and African C-Band services (i.e. an EKU will be required).

11 EPS-EUMETCAST CONVERGENCE (EEC)

It is planned that there will be dissemination of EPS Global Data via the EUMETCast system. This effectively replaces the originally foreseen (baseline) EPS Near Real Time (NRT) system. Planning documents were prepared for approval by Delegations in 2004. A representative end-to-end feasibility test has been carried out to verify the proposed design.

Finalisation of system implementation and verification/validation of the Phase I Design is expected in the 4th quarter of 2005.

A contract has been placed with the current Ku-Band service provider, providing an additional 3 Mbps (permanent) from August 2005 (previous bandwidth was 3.75 Mbps).

There will be a permanent 12 Mbps data rate capability from 1 April 2006 (or later if the Metop launch is delayed), allowing comprehensive testing of EPS Global Data dissemination with full/maximum data stream end-to-end performance testing.

There is one beneficial side effect – it allows the temporary dissemination of MSG-2 (Meteosat-9) data during commissioning in the first half of 2006!