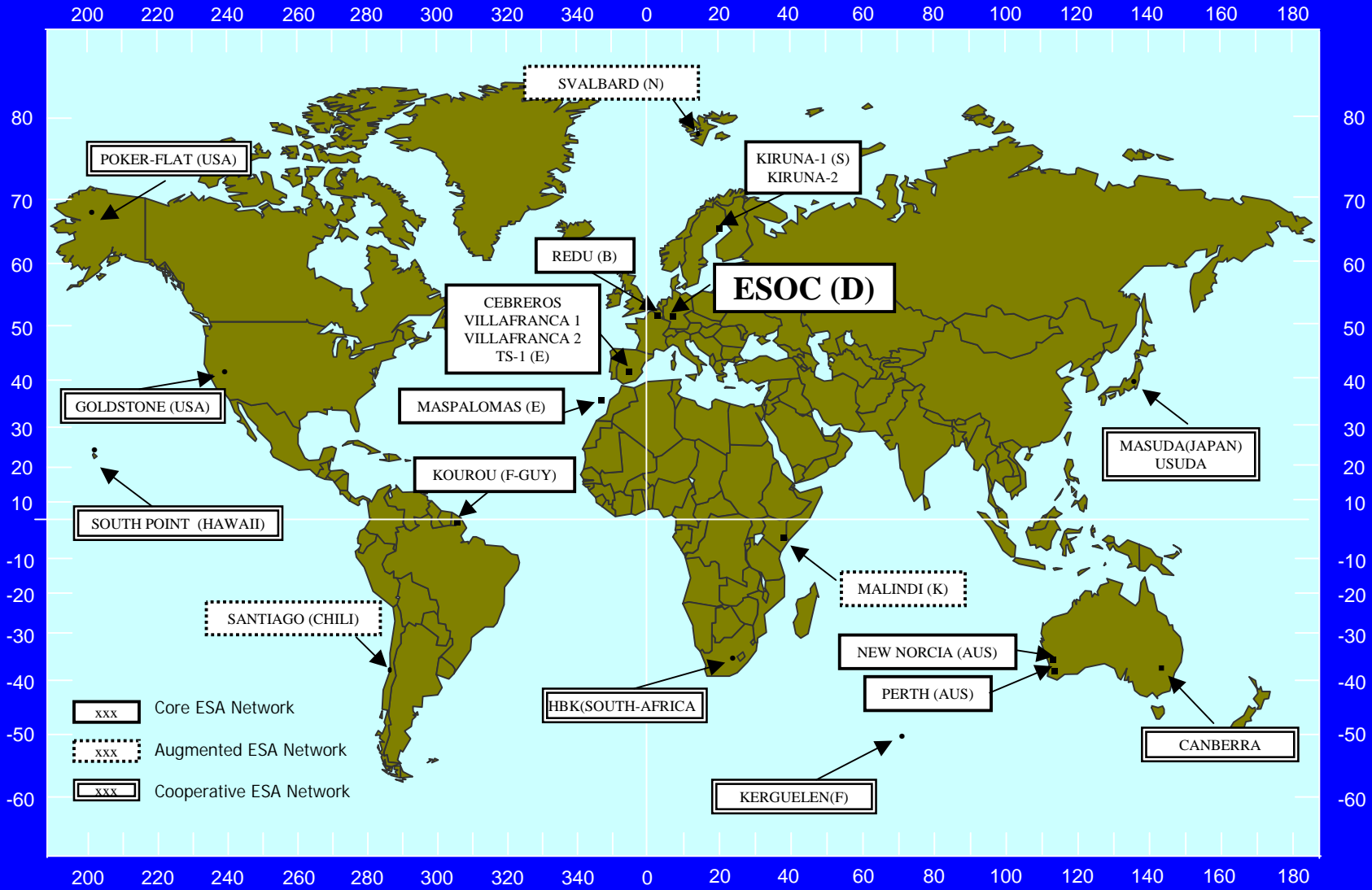


ESA Tracking assets

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ESA Cooperative Network (subset)

Tracking assets for cross-support

■ Core ESA Network

- The ESA core Network is the set of stations or terminals owned by ESA and operated under direct ESA control: Cebreros, Kiruna, Kourou, Maspalomas, New Norcia, Perth, Redu and Villafranca

■ Augmented ESA Network

- The ESA augmented Network includes additional stations rented on an extensive period, in order to augment the data return from the satellites during the LEOP and Routine phases. The stations are: Malindi(ASI/CRPSM), Santiago(CEE) and Svalbard(NSC/KSAT).

■ Cooperative ESA Network

- The ESA cooperative Network includes the stations of external Space Agencies with whom an Agreement or a Frame Contract has been concluded. It includes the following Agencies: CNES, DLR, JAXA, NASA and SSC/Prioranet



General

- Station Interfaces are CCSDS Compatible
 - Modulation
 - Coding
 - Packet Telemetry
 - Packet Commanding
 - Space Link Extension (SLE) services
 - Orbit Information



Kiruna

■ Kiruna – 1

- 15m antenna.
- S and X band downlink G/T 27.7 (S) and 36.9 (X) at 5 degrees elevation EIRP 71 dBW (S)
- IFMS and Cortex's have been deployed
- Bit rates up to 4 Mbps; potential for higher bit rates with new versions
- SLE services (CLTU, RAF, RCF) available at ESOC.
- SLE services (CLTU, RAF, RCF) at the station by end 2003

■ Outstanding upgrading activities

- Full TCP/IP communications (end 2004)
- Replacement of up and down converters (2004-2005)
- Deployment of a new TM/TC system TMTCS (end 2005)

Kiruna

■ Kiruna-2

- A second 13m antenna is available as well: G/T 21.4 (S) and 35.6(X) EIRP 69 DBW (S).
Shared base-band equipment

KIRUNA - 1



K o u r o u

■ Kourou

- 15m antenna.
- S and X band up and downlink – Upgrade performed in X-band
- G/T 29.1 (S) and 37.5 (X) at 5 degrees elevation
- EIRP 81.2 dBW (S); 82.8 dBW (X)
- IFMS deployed
- Bit rates up to 2 Mbps
- SLE services (CLTU, RAF, RCF) available at ESOC.
- SLE services (CLTU, RAF, RCF) at the station by end 2005

■ Outstanding upgrading activities

- Replacement of up and down converters (2005)
- Deployment of a new TM/TC baseband system TMTCS (2005)

M a s p a l o m a s

■ Maspalomas

- This Station has been upgraded for Cluster II in 2002
- 15m antenna.
- S and X band downlink G/T 28.6 (S) and 37.5 (X) at 5 degrees elevation
- S band uplink; EIRP 72.1 dBW (S)
- IFMS deployed
- Dual X.25 or TCP/IP communications available
- Bit rates up to 2 Mbps
- SLE services (CLTU, RAF, RCF) available at ESOC.
- SLE services (CLTU, RAF, RCF) available at the station as from 2005



Maspalomas



New Norcia

■ New Norcia

- This first ESA deep space station has been successfully handed over to Operations in December 2002.
- 35m antenna.
- S and X band downlink G/T 40 (S) and 49.5 (X) at 5 degrees elevation
- S and X band uplink; EIRP 97 dBW (S) and 107 dBW (X)
- IFMS deployed
- TCP/IP communications available
- Bit rates up to 2 Mbps
- SLE services (CLTU, RAF, RCF) available at ESOC.
- SLE services (CLTU, RAF, RCF) will be available at the station as from end 2005 with the deployment of the TMTCS



New Norcia



Perth

■ Perth

- 15m antenna.
- S and X band downlink G/T 27.5 (S) and 37.5 (X) at 5 degrees elevation
- S band uplink; EIRP 78 dBW (S) ** No access to the deep space band **
- IFMS deployed
- TCP/IP communications available
- Bit rates up to 2 Mbps
- SLE services (CLTU, RAF, RCF) available at ESOC.
- SLE services (CLTU, RAF, RCF) available at the station as from end 2005

■ Future upgrading activity

- Deployment of the new TM/TC system (2005)
- Replacement of up and down converters (2005)
- X-band uplink upgrade (2004-2005) – On-going activity



R e d u

■ Redu

- 15m antenna, used mainly as routine station for Integral
- S band downlink G/T 29.6 (S) at 5 degrees elevation
- S band uplink; EIRP 72.5 dBW (S)
- IFMS deployed
- TCP/IP communications available
- Bit rates up to 2 Mbps
- SLE services (CLTU, RAF, RCF) available at ESOC.
- SLE services (CLTU, RAF, RCF) available at the station as from 2005

■ Future upgrading activity

- Deployment of the new TM/TC system (2006)
- Replacement of up and down converters (2006)

V i l s p a - 1

■ Vilsba-1

- 15m antenna
- S band downlink G/T 28.9 (S) at 5 degrees elevation
- S band uplink; EIRP 72.9 dBW (S)
- Bit rates up to 0.5 Mbps
- SLE services (CLTU, RAF, RCF) available at ESOC.
- SLE services (CLTU, RAF, RCF) available at the station as from 2005

■ Future upgrading activity

- TCP/IP communications (2004)
- deployment of the IFMS (2006)
- Deployment of the new TM/TC system (2006)
- Replacement of up and down converters (2006)
- Replacement of the Servo system and front-end controller (2004)



V i l s p a - I I

■ Vilsba-2

- 15m antenna
- S band downlink G/T 29.0 (S) at 5 degrees elevation
- S band uplink; EIRP 79 dBW (S)
- Bit rates up to 0.5 Mbps
- SLE services (CLTU, RAF, RCF) available at ESOC
- SLE services (CLTU, RAF, RCF) available at the station as from 2005

■ Future upgrading activity

- TCP/IP communications (2004)
- Deployment of the IFMS (2005)
- Deployment of the new TM/TC system (2006)
- Replacement of up and down converters (2006)
- Upgrade to X-band up and downlink (2005-2006)



Transportable Station TC-1

- Transportable station (TS-1)
 - 5.5m antenna
 - S band downlink G/T 19.0 (S) at 5 degrees elevation
 - S band uplink; EIRP 70 dBW (S)
 - Bit rates up to 4 Mbps
 - SLE services (CLTU, RAF, RCF) available at ESOC and at the station
- Future upgrading activity
 - TCP/IP communications (2004)
 - Replacement of up and down converters (2006)

V i l s p a - 4

■ Vilsba-4

- 12m antenna
- This antenna is at present being upgraded for X band uplink and X and Ka bands downlink.
- The Ka band part is 31.8 to 32.3 GHz.
- Ka band G/T at 5 degrees elevation is 45.5 dB/K (46.5 at 30 deg)
- The X band G/T at 5 degrees elevation is 35.3 dB/K
- The X band EIRP is 80 dBW
- Bit rates up to 4 Mbps (more if dedicated baseband equipment available)
- SLE services (CLTU, RAF, RCF) available at ESOC

- This terminal is planned to be used in August 2004 for the KATE experiment on SMART-1.



Vilspa



Future Deep Space Station in Cebreros (Spain)

■ Cebreros

- 35m antenna.
- X-band up and downlink
- Ka band downlink. The Ka band downlink frequency is 31.8 to 32.3 GHz.
- Ka band uplink planned in 2010 for Bepi-Colombo
- X-band EIRP = 107 dBW; X-band G/T = 50.8 dB/K
- Ka band G/T = 55.8 dB
- SLE services (CLTU, RAF, RCF) will be available at the station as from end 2005.
- Bit rates up to 2 MBps.

- This antenna is planned to be procured before the end of 2005 and will be used initially for Venus-Express (X/X only)



CEBREROS

