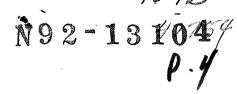
provided by NASA Technical Reports Serv

870-14, Rev. AF



GIOTTO EXTENDED MISSION (GEM)

(Cooperative)

TDS Mgr: D. Enari

NOPE: R. Rose

Project Mgr: M. Grensemann (ESTEC)

MOM: D. E. B. Wilkins (ESOC)

LV/Range: Ariane/CSG

Launch Date: July 15, 1985

Projected SC Life/DSN Support:

Project Responsibility: European Space Agency (ESA)

Source: SIRD December 1990

Sponsor: ESA

Program Manager: G. Strobel

A. MISSION DESCRIPTION

The primary objectives of the Giotto Extended Mission (GEM), are to determine the composition and physical state of the Grigg Skjellerup comet's nucleus; to determine the processes that govern the composition and distribution of neutral and ionized species in the cometary atmosphere.

Prior objectives of Giotto were the same as those for Halley's comet in March, 1986.

B. FLIGHT PROFILE

Giotto consists of a single European Space Agency (ESA) spacecraft that was launched in 1985 from Centre Spatial Guyanis in French Guiana on an Ariane launch vehicle. After a successful launch into geostationary orbit and a heliocentric transfer trajectory, the spacecraft successfully encountered Halley's comet in 1986.

One month after encountering Halley's comet, March 1986, the spacecraft was placed in hibernation in a heliocentric orbit slightly less than 1 A.U. Between February 1990 and July 1990 the spacecraft was successfully reactivated, checked out, placed on a trajectory course to intercept comet Grigg Skjellerup in July 1992. The spacecraft has been in hibernation since July 1990.

C. COVERAGE

1. Coverage Goals

The telecommunication link threshold is influenced by the distance of the spacecraft from the Sun and the aspect angle of the spacecraft with respect to the Sun and Earth. Additional coverage is being provided by the DLR Weilheim, Germany, and ESA Perth, Australia, tracking stations. Stage I and Stage II of the Giotto Extended Mission have been completed. The DSN is committed to supporting the Stage III SIRD, whose requirements are listed below.

The DSN expects to meet these coverage goals even though requirements are in excess for the 70-m and 34-m standard subnets. View periods and other user requirements are not in direct conflict with Giotto during the Stage III support.

Mission Phase	Period	(30 days) Passes/Month	Antennas
Stage I			
Reactivation Phase	2/90 - 3/90	30	70-m
Scientific Payload Check Out Phase	4/90	15	34 STD
Near Earth Phase	5/90	28	34 STD
Stage II			
Earth Flyby and Hibernation III	7/90	None	None

870-14, Rev. AF

Mission Phase	Period	(30 days) Passes/Month	Antennas
Stage III			
Reactivation Phase	5/92	21	70-m
Cruise Operations	6/92	16	70-m/34 STD
Rehearsals and	6/92 - 7/92	12	70-m/34 STD

2. Network Support

The support provided by the DSN is indicated in the following table:

System	Goldstone	Canberra	Madrid
	12 14 15 16	42 43 45 46	61 63 65 66
S-band TLM	P P	РР	P P
X-band TLM	P P	P P	P P
S-band CMD	P P	P P	P P
S-band TRK	P P	Р Р	P P
X-band TRK	P P	P P	P P

D. FREQUENCY ASSIGNMENTS

Frequencies are allocated according to the following table:

System	Uplink (MHz)	Downlink (MHz)	Polarization
S-band TLM		2298.703704	RCP
X-band TLM	<u></u>	8428.580248	RCP
S-band CMD	2116.72	-	RCP
S-band TRK	2116.72	. <u>-</u>	RCP
X-band TRK		8428.580248	RCP

E. SUPPORT PARAMETERS

The support parameters for the Telemetry, Command, and Support Systems are listed below:

(1) Telemetry

Data Streams

1 (S- or X-band)

Format

PCM/PSK (uncoded/coded) 46.080 kHz for 360 b/s

Subcarrier Frequency

276.480 kHz for 5760, 23040

and 46080 b/s

Record

DODR Required

(2) Command

Format

PCM/PSK

Bit Rate

125/8 b/s (15.625 b/s)

Subcarrier Frequency Subcarrier Waveform 16 kHz Sine

(3) Support

Uplink Power

Up to 20 kW (34-m),

100 kW (70-m)

Antenna Rate

Sidereal

Antenna Angle Data

Not Required

Doppler Rate

Moderate to High

Range Format

Standard DSN

Recording

. Analog

Not Required

. Digital

Required

F. TRACKING SUPPORT RESPONSIBILITY

The allocation of responsibilities for tracking support is listed in the following table:

Mission Phase

Support Responsibility

Stage I

DSN/ESA-Perth/DLR-Weilheim

Stage II

DSN/ESA

Stage III

DSN/ESA-Perth/DLR-Weilheim