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Document history

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with specific inputs supplied by L.C. Chiappetti, G.C. Perola and taken from the Data Analysis Working Group document: "A Proposal for the organization of the activities concerning the SAX data analysis calibration, distribution and archive (The "Centro Dati Scientifici"), December 15th, 1987.

The document has been examined in a number of plenary discussion within the SAX Ground Segment Working Group extended to the SAX Data Analysis Working Group.

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1 INTRODUCTION

1.1 Scenario

The general framework of a typical Ground System for an astronomical satellite mission include several functions, which may be distributed among various locations and entities (see fig. 1.1) according to mission-dependent motivations.

This section, first describes the general framework, then it presents the SAX Ground System and its major entities: the SAX Ground Segment and the SAX Scientific Data Centre.

The general framework section is not part of the requirements and is provided for information only.

1.1.1 General Framework -

A typical astronomical mission, particularly if of the observatory type, consists in a series of observations of celestial targets, each of which is requested by a scientific user (the observer). In general the would-be observer submits a proposal of observation(s) to a recognised central body (normally an Agency), in response to a solicitation, which normally takes the form of an Announcement of Opportunity. The collection of all submitted proposals needs some processing (inclusive of filing, technical feasibility assessment, scientific judgement of merit). A Time Allocation Committee is generally the body in charge of the peer review of the scientific merits. Only approved proposals enter the Mission Observing Program.

Such Program is then transmitted to a Mission Planning team, which generates, with a stepwise process, the timeline of the individual observations, attempting also to optimize the overall mission efficiency. In doing this competences are needed both on the spacecraft side (e.g. to compute manoeuvres and related constraints) and on the payload side (e.g. to translate the observers' wishes into payload configurations and finally list of telecommands).

All necessary telecommands are then uplinked at due time by Spacecraft Control.

Data incoming from the satellite are received from a Ground Station, which may be at a different location from the Control Centre. At the Control Centre raw data are filed for temporary use, and archived. Some of the processing done at the Control Centre is standard (spacecraft data monitoring, attitude and orbit determination), some other may require payload specific competences (payload quick look).