

18. Instruments of Opportunity

GOES N-P spacecraft were designed with provisions to accommodate up to two additional observational instruments, which are referred to as instruments of opportunity (IOO). The provisions include space on the nadir facing Imager/Sounder mounting plate, structural support capabilities, a defined clear field of view, power capacity, launch vehicle lifting capacity, thermal radiator area, telemetry and command channels, and data downlink bandwidth over the multi-use data link (MDL). In addition, the IOOs are provided with the inherent attitude control and knowledge capabilities and contamination control attributes of the GOES spacecraft.

Table 18-1 summarizes key spacecraft instrument accommodation parameters. The entries in the table refer to total IOO accommodations, which would necessarily be shared if two IOOs were flown on any single spacecraft. Additional details, including interface requirements on the IOOs, can be found in *Interface Requirements Document for Geostationary Operational Environmental Satellite (GOES) N-Q Instruments of Opportunity*, BSS GA27082, February 1999.

Table 18-1. Key IOO Accommodation Provisions

Parameter	Value
Mass	35 kg
Unobstructed fields of view	10° cone about nadir
Power source voltage	42 V
Maximum operational power	150 W
Telemetry channels	1 8-bit analog 9 8-bit conditioned analog
Command channels	6 pulse 1 serial
Science data down-link bandwidth	100 kbps
Timing signals	1 Hz pulse accurate to 1 msec plus 24 bit time tag
Heat dissipation	Roughly 100 to 250 W for mission allowable temperatures of roughly 5 to 70°C, respectively
Attitude control accuracy	Normal to spacecraft nadir face pointed to earth's center within 0.1° 3 sigma
Attitude knowledge accuracy	112 μrad 3 sigma at 8 Hz
Attitude stability	35 μrad 3 sigma over 1 sec

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Note that as of the date of publication of this document, no IOOs have been identified for flight on GOES N spacecraft. Instruments previously considered for flight included a lightning mapper, a volcanic ash tracker, and a special event storm staring imager. All future IOO flight opportunities are as announced, selected and arranged by the GOES Program Office at NOAA.