MASS, POWER, DATA RATE & POINTING
(FOR COOPERATIVE STUDY ASSESSMENT ONLY)

Instrument	Mass (kg)		Power (W)				Data Rate (kbps)		Data Storage per Orbit (Gb)	Pointing (arcsec)				Dimensions (mm)			Mounting Surface (Normal)	Instrument FOV (Relative to Nadir)	Unobstr. Thermal FOV
	Alloc.	w/25%	Alloc.	w/25%	Peak	w/25%	Average	Peak		Control	Knowledge	Stability	Jitter	X	Y	Z			
TES	290	363	275	344	290	363	4900	6200	28.9	108	108	36/sec	15 over 16 sec	1300	1460	1000	Nadir	Track (+45º/ -71º) Cross (±45º)	(-Z) Face (±75º)
HIRDLS	130	163	155	195	230	288	50	100	0.31	900/all axes	120 pitch 120 roll 180 yaw	(Note 1)	(Note 2)	1420	1190	1370	Nadir	Track (+22.1º/+27.3º) Cross (-21º /+43º)	(+Y) Face (±85º)
MLS (GHz Channels)	225	281	195	244	NA	NA	NA	NA	NA	1800 pitch 180 roll 1800 yaw	100	(Note 5)	50/s p/r 1800/s y 0.1 to 30s	1300	1730	1800	Velocity Vector	Track (+55º to +77º) Cross(±5º)	(Cold Space)
MLS (THz Channel)	55	69	105	131	NA	NA	NA	NA	NA	1800 pitch 180 roll 1800 yaw	100	(Note 5)	50/s p/r 1800/s y 0.1 to 30s	400	800	950	Nadir	Track (+55º to +77º) Cross(±5º)	(Cold Space)
MLS Spectrometer	95	119	95	119	NA	NA	NA	NA	NA	NA	NA	NA	NA	550	650	900	NA	NA	(Cold Space or Nadir)
MLS (Total) (Note 3)	375	469	395	494	455	569	100	100	0.59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ODUS	40	50	50	63	70	88	100	100	0.59	1800 pitch 1800 roll 3600 yaw	900	TBD	360/ 200msec	500	500	300	Nadir	Track (±0.8º) Cross (±60º)	TBD

Note 1: Long term stability - 180 arcsec pitch/roll/yaw, short term stability - 60 arcsec pitch/roll/yaw, Rate - 30 arcsec/sec pitch/roll/yaw.
Note 2: Equivalent s/c angular accel. < 1.9 radian/sec^2 rms, equivalent s/c angular motion < 3.1 arcsec rms, equivalent s/c translational accel. < 0.19 g rms (Detail in HIRDLS EID)
Note 3: MLS will have one spacecraft electrical interface
Note 4: 705km 98.2 degree inclination sun synchronous orbits for all spacecraft
Note 5: Stability requirements covered by control and jitter requirements

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- Mass to Orbit Assumption: 804 kg
  - 5 kg for Separation Hardware (which stays with satellite)
- Structure must avoid 45 Hz to 65 Hz
- System shall be Single Fault Tolerant
- Instrument delivery dates:
  - March, 2001 -- TES, ODUS, HIRDLS
  - December, 2001 -- MLS
- Launch dates:
  - September, 2001 -- TES
  - December, 2001 -- HIRDLS/ODUS
  - June, 2002 -- MLS
- Ascending node crossing times:
  - HIRDLS/ODUS 3:30 PM
  - MLS 1:45 PM
  - TES 10:30 AM (May shift to 1:30 PM based on coordination of data)

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- Downlink/Data Storage parameters
  - Nominally one contact with ground station per orbit
  - Nominal science downlink time should be 50% of the average time over ground stations
  - Data Rate shall be capable of downlinking 2 orbits worth of science data in one long contact
  - Data storage device shall be capable of storing 2 orbits of data, with error correction overhead, plus a 25% margin