	A	B	C	D	E	F	G
1	**Title**	**Background**	**Justification for Space Flight & Experiment Description**	**Flight Requirements**			
2				**Orbit**	**Altitude**	**Inclination**	**Correlative Environment**
3	Relativistic electron & energetic proton experiment (REEPER)	Two autonomous detectors, High Energy Electron Telescope (HEET) and Energy Proton Telescope (HEP) have been developed and need to be flight validated. Measurement ranges: HEET - 3-30 MeV electrons; HEP - 25-450 MeV protons.	Perform a space experiment to validate HEET and HEP. Measurements would be available as correlative data for other testbed experiments.	Near equatorial GTO			Energetic particle populations
4	RadFET dosimeters/ temperature monitors	The RadFET dosimeters/temperature monitors are developed and could be used to provide correlative environments measurements.	No validation required. Range for total ionizing dose: 0.3 - 1000 kRad				Total ionizing dose (TID)
5	LPD charged particle spectrometer	This spectrometer is developed and could be used to provide correlative environments measurements.	No validation required. Measurement range is 1-250 MeV for protons, 0.5-20 MeV for electrons; 6-250 MeV for alpha particles; >1.5 MeV/nucleon ions 100 kcps, 32 particle-energy spectral bins, custom G-factor 0.05 - 0.3 cm^2 sr				Charged particles
6	LPM energetic particle spectrometer	This spectrometer is developed and could be used to provide correlative environments measurements.	No validation required. Measurement range is 1-150 MeV for protons, 0.3-1 MeV for electrons; >3 MeV/nucleon for ions 200 kcps, 12 particle-energy spectral bins, G-factor 0.2 cm2 sr ; +/- 30 deg FOV				Energetic charged particles
7	Atomic oxygen monitor	This spectrometer is developed and could be used to provide correlative environments measurements.	No validation required. Monitor has adjustable flux sensitivity (1-90 min temporal resolution at LEO). Monitor is a temperature-controlled, carbon actinometer-based atomic oxygen monitor.				Atomic oxygen
8	Plasma spectrometer	Characterize the plasma environment (electrons and ions) from a few eV to tens of keV so that this plasma data will allow a determination of spacecraft potential.	A number of spectrometers with flight heritage are available.				
9	Inter-Mars tissue equivalent proportional counter (ITER)	This counter measures linear energy transfer spectrum (estimate LET spectra) in a tissue equivalent medium. It has flown in the Shuttle payload bay on 12 missions.	No validation required. The LET spectrum is recorded at 2 second cadence in 512 pseudologarithmic-spaced channels				Linear Energy Transfer (LET) spectrum
10	Extra-vehicular charged particle directional spectrometer (EV-CPDS)	This spectrometer consists of 3 independent charged particle telescopes mounted on International Space Station (ISS) truss. It has onboard data storage and command and telemetry via a 1553B interface. Instrument should be on the ISS in Jan 2002 with a planned minimum life of 5 years. Spares are being built. ISS measurements should be available through NSSDC.	No validation required. Each telescope measures incident ion energy in the range of 10-450 MeV/amu, mass from 1-23, and arrival direction +/- 2 deg. Electrons with energies less than 2 MeV can be detected. The telescope aperture is about 60 deg.				Charged particles, angular flux distribution
11	Compact Environmental Anomaly Sensor (CEASE)	CEASE is a single, compact instrument that measures all aspects of the the space radiation environment of primary operational interest.	This instrument is validated & mature, nearly risk-free, and permits extrapolation to other spacecraft and orbits where CEASE is used. It measures total dose, High Linear Energy Transfer (LET) dose, Low LET dose, spectra of electrons from 0.5 keV to multi-MeV, spectra of protons 0.7 to >100 MeV, and single event effects particles.				Dose, electron and proton spectra
12	ESA-500 (electrostatic analyzer)	This is a nested, quadraspheric electrostatic analyzer. It measures the energy spectrum of electrons and protons, 30 eV - 30 keV, and also measures the angular distribution.	No validation required. The analyzer has flown on Shuttle and will fly on DMSP soon. It provides the environmental information necessary to understand spacecraft charging and its hazards.	GEO or lower altitude polar			Electrons and ions, 30 eV-30 keV

	A	B	C	D	E	F	G
1	**Title**	**Background**	**Justification for Space Flight & Experiment Description**	**Flight Requirements**			
2				**Orbit**	**Altitude**	**Inclination**	**Correlative Environment**
13	High energy proton telescope	This telescope measures the energy spectrum of penetrating protons. It measures the differential spectrum 25 - 450 MeV, the integral flux greater than 450 MeV, and has 12 degree angular resolution.	This is a mature instrument, extensively tested and calibrated, & awaiting flight. It provides the environmental information necessary to understand the most penetrating portion of the space radiation environment.	GTO near equatorial inclinaiton is best			Energetic protons
14	High linear energy transfer (LET) radiation spectrometer	This spectrometer measures LET, a key parameter in characterizing the environment effects for other experiments.	No validation required.	Any	Any	Any	Incident particle radiation
15	Particle environment monitor	This compact instrument measures the particle environment.	No validation required. Proton and heavy ion flux and spectra are key parameters in characterizing space environment effects.	HEO	HEO	HEO	
16	Fluxmeter	This low-power, light weight, single package space particle monitor is combined with an array of MOS dosimeters to quantify the changes in radiation that may produce space environment effects.	This concept will provide a way of quantifying the variable radiation environment for individual experiments and locations on SET.	HEO	HEO	HEO	Dose & particle flux in LET bins
17	Spacecraft charging environment monitor	Traditional spacecraft charging has been identified in both geostationary altitudes and in the auroral ionosphere. For serious charging to occur, the ambient population must have a large component with energies > 7 KeV. This monitor measures electrons and ions involved in charging and has been incorporated on DMSP spacecraft.	No validaiton required. This monitor measures electrons responsible for negative charging of spacecraft (> 7 keV). It also measures the flux of ions to determine the energy of the charging peak.	LEO polar/MEO/GEO	> 600 km to 6.5 RE	~90deg in LEO, <10 deg GEO	
18	Deep dielectric charging environment monitor (CEASE)	During the CRRES mission, the largest number of upset events were due to > 0.1 MeV electrons burying themselves in dielectric materials. Many spacecraft anomalies are believed to be due to deep dielectric discharges.	No validaiton required. It measures the flux of electrons with energies greater than 100 keV to determine the correlation between the frequency of occurrence electrons with fluxes greater than 100 keV and the occurrence and intensity of the resultant effects.	GEO/GTO		<10 deg GEO	0.1-2 MeV electrons