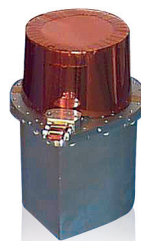
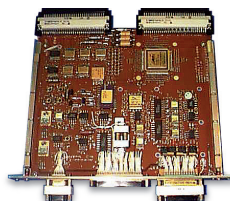


TES-OBS On-Board Calibration Subsystem

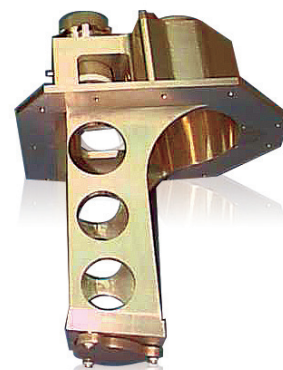
The Tropospheric Emission Spectrometer (TES) instrument is a high resolution FTS, developed by JPL for the NASA's Aura polar orbiting platform.



Spatial Calibration Source



OBCS Control Electronics



On-Board Radiometric Source

TES helps understanding the atmosphere's chemistry, especially in the troposphere and can distinguish the concentration of gases at different altitude because of its high spectral resolution. Aura has been launched on July 15, 2004. The mission studies the Earth's ozone, air quality and climate.

ABB Analytical Measurement built the On-Board Calibration Subsystem (OBCS) for the TES instrument. The OBCS consists of a temperature controlled on-board Radiometric Source (OBRS), a Spatial Calibration Source (SCS) and their control electronics board. OBCS allows the radiometric and spatial calibration of the TES instrument during flight.

The compact high emissivity cavity of the OBRS produces an IR calibration signal in the range 650 to 3050 cm^{-1} . Its cylindrical cavity, ended with a cone shape and coated on the inside with Enhanced Martin Black, is thermally insulated and equipped with heaters and PRT's. The radiometric signal is commandable from ambient to 340K at a radiometric accuracy better than 0.1K (end of life) in brightness temperature and with stability better than 0.015K over any 60 second period. The cavity effective emissivity is greater than 0.998 over the above spectral range and over the full aperture of 65 mm. A radiometric

model has been developed and validated by test within 0.05K in brightness temperature.

The SCS is an optical device providing an IR image of a line source that is used along with the scanning motion of the TES instrument pointing mirror to spatially characterize the relative position of the TES detectors. The line source temperature is adjustable by command. The orientation of the line source is aligned very precisely. Vibration tests have been performed to verify the device ability to survive launch conditions. The OBS control electronics consists of the analog and digital electronics required to monitor and control the OBRS and SCS. It is using a VME bus interface to communicate with the TES instrument.

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