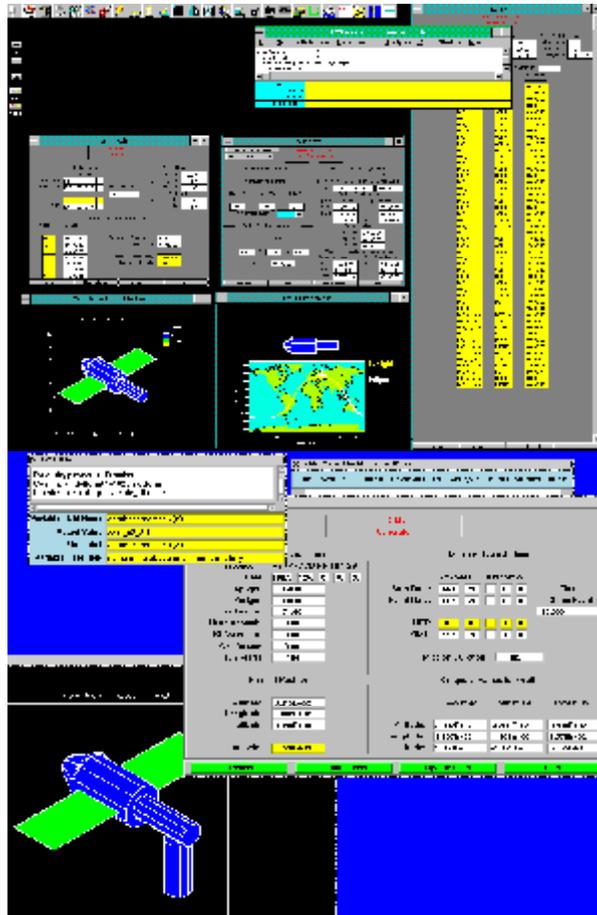


# EWB: The Environment WorkBench Version 4.0

The Environment WorkBench EWB is a desktop integrated analysis tool for studying a spacecraft's interactions with its environment. Over 100 environment and analysis models are integrated into the menu-based tool. EWB, which was developed for and under the guidance of the NASA Lewis Research Center, is built atop the Module Integrator and Rule-based Intelligent Analytic Database (MIRIAD) architecture. This allows every module in EWB to communicate information to other modules in a transparent manner from the user's point of view. It removes the tedious and error-prone steps of entering data by hand from one model to another. EWB runs under UNIX operating systems (SGI and SUN workstations) and under MS Windows (3.x, 95, and NT) operating systems.



*The user interface for EWB 4.0 provides a consistent look and feel for all its models across all supported platforms.*

MIRIAD, the unique software that makes up the core of EWB, provides the flexibility to easily modify old models and incorporate new ones as user needs change. The MIRIAD approach separates the computer assisted engineering (CAE) tool into three distinct units:

- A modern graphical user interface to present information
- A data dictionary interpreter to coordinate analysis
- A database for storing system designs and analysis results

The user interface is externally programmable through ASCII data files, which contain the location and type of information to be displayed on the screen. This approach provides great flexibility in tailoring the look and feel of the code to individual user needs. MIRIAD-based applications, such as EWB, have utilities for viewing tabulated parametric study data, XY line plots, contour plots, and three-dimensional plots of contour data and system geometries. In addition, a Monte Carlo facility is provided to allow statistical assessments (including uncertainties) in models or data.

EWB has modeled interactions for several flight experiments, such as the Solar Array Module Plasma Interactions Experiment (SAMPIE) and the Photovoltaic Array for Space Power Plus Diagnostics (PASP Plus). It has been used to interpret and model data obtained from flight experiments as they were occurring. Such was the case with the Space Experiments with Particle Accelerators (SEPAC), the Tethered Satellite System (TSS-1), and the Plasma Motor Generator (PMG) experiments. EWB also has been used extensively in the design and operation of the Plasma Contactor device for the international space station.

With EWB, engineers can get quick answers right on their desktop to "What if?" type design questions related to space environment interactions. Once a spacecraft's geometry has been defined and orbital parameters entered, the user can interact in real time with the tool to obtain answers from the several available models.