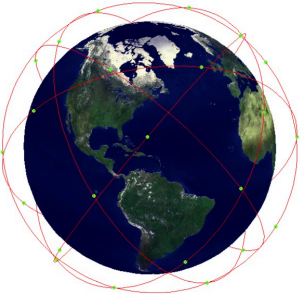


# ControlPlan™

## Satellite Operations Planner

Princeton Satellite Systems ControlPlan solves complex, multi-constraint problems to support the decision-maker



ControlPlan is user-centric, decision support software that produces courses of action within complex decision spaces. The software uses a flexible framework with optimization libraries to leverage the right mathematical tool for each problem.

### What It Does

The ControlPlan planning framework supports tradeoff analyses of multiple courses of action. The design provides users the ability to develop and store a diverse set of plans to accommodate a wide range of scenarios. Within each scenario, courses of action that meet system and mission constraints are developed using user-defined, mission-specific criteria.

Tradeoff analysis between plans is performed through detailed displays that provide a time-phased representation and user-defined charts, tables and graphs comparing the plans.

ControlPlan's efficient computational engine allows the user to receive immediate feedback to apply modifications of his or her plans in real-time.

### User In Control

ControlPlan has the planner at the heart of its design. It allows the user to apply the most advanced mathematical tools in creating a set of optimal plans while freeing them to impart a mission focus. The easy-to-use front-end allows any subsystem engineer to participate in the planning process and for multiple engineers to collaborate in the planning process.



Image courtesy of USAF

### Satellite Operations Planning

ControlPlan helps the planner to accomplish any set of mission requirements. It allows operators to maintain a laser-focus on the mission by freeing them from complex details of systems, capabilities and limitations. The engineers, managers and operators incorporate requirements from each subsystem and due to its collaborative architecture, each subsystem engineer can work directly with ControlPlan. Specialized knowledge or extensive training is not needed.

### A Complete Solution

ControlPlan provides a complete solution to the satellite operations planning challenges:

- Optimized planning solutions for one or more communication satellites
- User-centric interface that provides an integrated setting for mission inputs, plan development and trade-off analysis
- Planning framework in a client-server, service oriented architecture to support distributed collaboration

### Capabilities

- Rapidly develop user-defined courses of action in a complex decision space
- Optimally plan satellite maneuvers, payload frequency, beam allocations and other subsystems operations
- Supports collaborative, networked planning
- Service-oriented client / server architecture

# INFORMATION SHEET

## ControlPlan

### ControlPlan™

- User-Centric
- Operations focused
- Proven capability developed under the Navy's Program Executive Office Space Systems
- Answers the question of how to manage a complex satellite or multiple satellites

*Princeton Satellite Systems has twenty years of experience working with commercial clients, space agencies and the Department of Defense providing best-of-class solutions.*

### ControlPlan History

ControlPlan was originally developed as a planning tool for the Mobile User Objective Satellite (MUOS) under Navy's Program Executive Office Space Systems for a contract starting in 2009. Called Satellite Planner for Execution and Reconfiguration (SPEAR), it generated mission options for this satellite system against a variety of spaceborne and ground-based threats within orbit, satellite, fuel and payload mission-constraints. ControlPlan demonstrated the ability to plan station-keeping maneuvers and allocate antenna beams simultaneously to meet mission objectives.

Under a follow-on Navy SPAWAR contract it was designed to operate within the Joint Space Operations Center Mission System (JMS). Development for the Navy is continuing under this contract.

### ControlPlan Deployment

ControlPlan is available as a standalone product or as a customized product to meet specific client requirements.

### Princeton Satellite Systems

We are an innovative engineering firm pushing the state-of-the-art in Aerospace, Energy and Control.

The company was founded 1992 and since then we have been an integral part of satellite control system development for missions including GPS IIR, Cakrwarda-1, ATDRS, and Sweden's Prisma. Our extensive satellite operations experience includes Asiasat, Telstar and Koreasat. We have developed the SunStation solar power station for electric vehicles and for home and industrial power. Our commercial software products include the Spaceraft Control Toolbox for MATLAB and we have developed a variety of control software and command and control products for the Air Force and the Navy. The company has received a wide range of patents from imaging sensors to nuclear fusion spacecraft propulsion.

Our world-class staff provides user-focused engineering talent in developing and applying new and innovative solutions to any set of complex problems.

For more information about Princeton Satellite Systems, please visit us on the Web at: [www.psatellite.com](http://www.psatellite.com) or contact our ControlPlan development lead, Dr. Joseph Mueller at 763-639-1553, [jmueller@psatellite.com](mailto:jmueller@psatellite.com)

