OR CONCEPTS APPLIED

COMMERCIAL CATALOG

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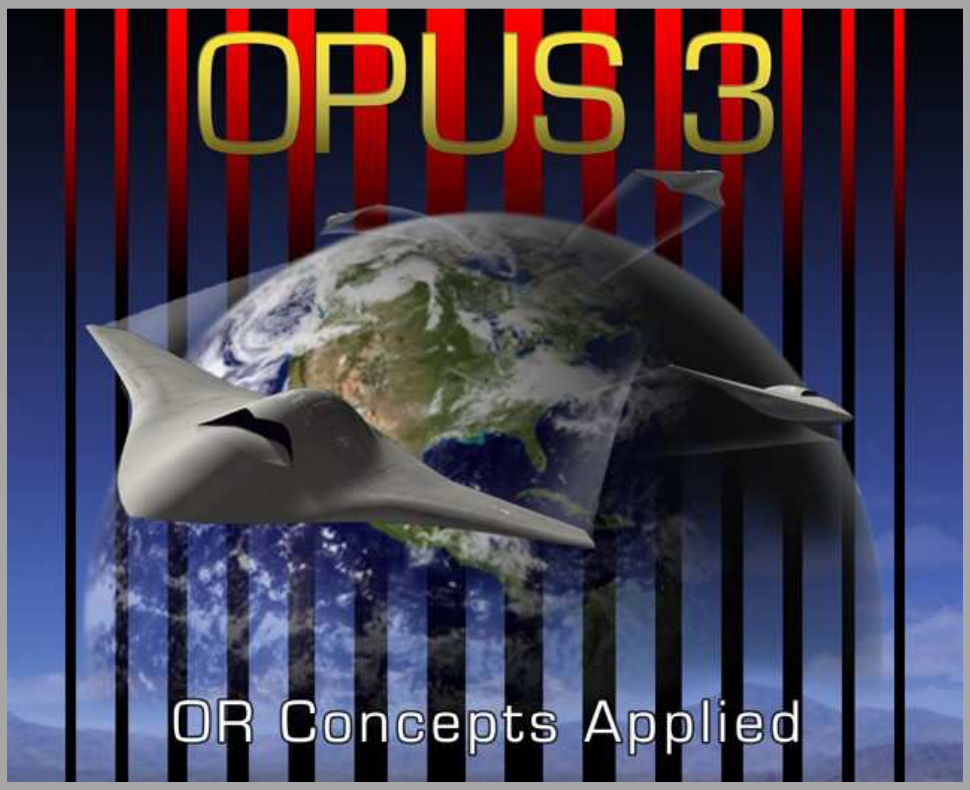

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OPUS: SOFTWARE FOR DYNAMIC REPLANNING

ORCA Planning and Utility System (OPUS)

The ORCA Planning and Utility System (OPUS) is software technology for military aircraft route planning and analysis. Core algorithms quickly generate goal-seeking, threat-avoiding, terrain-aware individual sortie routes and force level allocations for both strike missions and ISR missions. The OPUS Interactive product provides a wealth of graphical tools and map displays for multiple operating systems and hardware suites. In 2010, the product line was expanded to address the needs of operators, developers, analysts, and human factors researchers concerned with mission planning.

Build on It!

The OPUS Software Developer's Kit (SDK) makes it possible to embed core OPUS autorouting, allocation, and analysis functions into other applications – both on the ground and in the air. The technology is mature as evidenced by being certified for operational B-2 flights in 1999 and endorsed by the Navy's Advanced Technology Review Board in 2002. The software was flown extensively in 2005 on DARPA sponsored air vehicles. OPUS technology supports increasing spans of control by adding decision support tools for the ground station operator. The technology also supports onboard dynamic replanning.

Using the OPUS SDK can shorten your development schedule by weeks (or even months). If our extensive documentation isn't enough, ORCA also has training classes to assist your developers to integrate existing methods into your software. Additional technical support can also be arranged. The OPUS SDK was designed for you to build on it.

Plan on It!

Accomplishing difficult objectives in dangerous environments is the essence of military missions. Planning is used to increase the likelihood of success. LO signatures, terrain effects, multiple weapon and sensor footprints, changing threat configurations, and changing sets of support assets make planning complicated and time-consuming. Using OPUS for planning can save hours of painstaking detailed manipulations.

OPUS will generate flight feasible routes that take into consideration what pilots know is important. Analytical feedback and visualization tools are used to enhance situational awareness. As a decision support tool, OPUS provides more than a plan; OPUS also provides insights and alternatives. Involving users in the planning process is at least as important as the plan. OPUS was designed for people to plan on it.

Count on It!

It is often said that no plan survives contact with the enemy. Changes in the environment, the threat, the target, or even vehicle health and status conspire against the initial plan. Altering the plan is essential to maintaining effectiveness. Some events permit us to change our plans in a deliberate manner. Other changes (i.e. a newly discovered SAM) require an immediate reaction. OPUS generates solutions quickly enough to be very valuable for dynamic replanning.

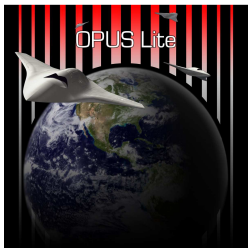
In 2005, OPUS technology enabled two X-45A unmanned aircraft to successfully complete graduation exercises in test flights 63 and 64. When confronted with a "pop-up" threat, OPUS was used to dynamically and autonomously generate new threat avoiding routes and reallocate sensors and weapons to attack the new threat as well as previously assigned targets. In difficult and time constrained situations, OPUS was designed and tested to allow you to count on it.

OPUS Interactive (OPUSi): OPUS, the ORCA Planning and Utility System, is an interactive mission planning and analysis system that has been used both operationally and in analytical applications. The user can define weapon footprints, sensor coverage envelopes, aspect dependent signature information, and locations for threats and targets. Core algorithms quickly generate goal-seeking, threat-avoiding, terrain-aware individual sortie routes as well as force level plans for both strike missions and ISR missions. The speed and fidelity of these algorithms has made OPUS useful to both analysts and operators. OPUS can be used to parse Air Tasking Orders (ATO) and Airspace Control Orders (ACO). Data-driven models and algorithms provide the flexibility to examine a range of potential aircraft, weapons, and sensors in a variety of scenarios. OPUS is a state of the art tool for modeling LO aircraft and the integrated air defense systems that they confront. Capabilities exist for assigning multiple aircraft to a set of objectives, optimizing individual aircraft sorties, and developing new plans while in flight. The OPUS tool can be used to generate *best use of force* routes for input to mission campaign level analyses.

Catalog Number: Windows/Linux: OPUS20-SL

OPUS Software Developer's Kit (SDK): The OPUS Software Developer's Kit (SDK) gives programmers the tools to build new applications that reference OPUS functions and to run the application. The SDK includes the Application Programmer's Interface (API), Examples, Documentation, and one API Run Time license. The API is a set of C++ software libraries and header files designed to access OPUS functions without use of the OPUS Graphical User Interface (GUI). The SDK includes an example program that exercises OPUS services using commands from an XML script. Many developers use the SDK quite successfully without taking the offered SDK class.

Catalog Numbers: Windows: OPUS40-SL; Linux: OPUS41-SL

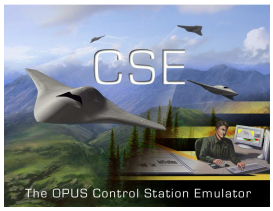


OPUS Lite (OPUS-L): OPUS Lite is an OPUS derivative designed to be used in applications that do not require the full set of OPUS capabilities. OPUS Lite includes OPUS mission planning tools for task allocation and route planning although certain modeling capabilities are restricted. OPUS Lite provides a fixed set of threat templates for vehicle-threat interaction modeling. OPUS Lite provides a menu-driven graphical user interface (GUI) that allows the user to input a limited set of OPUS data. OPUS Lite can be used for training and education, in a gaming environment, and for human factors research.

OPUS Lite is exportable.

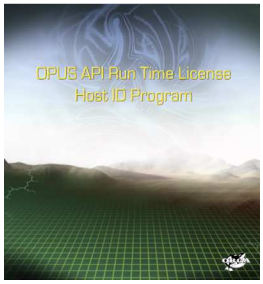
Catalog Number: Windows/Linux: OPUSL60-SL

Please note that OPUS software and related services [with the exception of OPUS Lite] have military applications and are subject to International Traffic in Arms Regulations [ITARS]. Only United States persons may acquire these products without licenses and other State Department approvals. There is a surcharge if an Export License is required.



OPUS Control Station Emulator (CSE): The OPUS Control Station Emulator (CSE) provides an instrumented test bed for human factors experiments related to unmanned vehicle control. The CSE is an evolution of efforts related to the Adaptive Levels of Autonomy (ALOA) test bed designed for a human factors research group studying how autonomy and autorouting impact increasing spans of control for unmanned vehicles. The CSE allows researchers to create realistic scenarios and run instrumented experiments effectively. With only 15 minutes of instruction, hundreds of users were able to control multiple aircraft well enough to provide valuable research results. Use this tool to improve the interface for your next control station!

Catalog Number: Windows/Linux: OPUS70-SL



OPUS API Run Time (RL): The OPUS API Run Time License is applicable to non-ORCA developed software applications built using the OPUS API. The OPUS API Run Time License gives the user the right to use the product on a single machine, with a single software application that references OPUS functions. The API is a key part of the OPUS SDK consisting of software libraries and interfaces designed to access OPUS functions without use of the OPUS Graphical User Interface (GUI). An example is the OPUS Script Processor, which reads commands from a text file, develops instructions, and executes these instructions through the OPUS API.

Catalog Numbers: Windows: OPUS50-RL; Linux: OPUS51-RL

OPUS Data Preparation System (DPS): The OPUS Data Preparation System (DPS) lets you build and edit datasets that can be used for both OPUS Interactive and OPUS API based applications. The Data Preparation System can be used for characterizing vehicle performance, using Digital Terrain Elevation Data (DTED) for terrain profiling, defining vehicle threat templates, and the characterization of weapon and sensor footprints. Mission planning and analysis is data intensive. This product provides interactive graphical tools to create and manage this data. The DPS is a useful adjunct to new tools built using the OPUS SDK.

Catalog Number: Windows/Linux: OPUS30-SL

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OPUS Products and Pricing

Information Technology Software	Maintenance Software
• OPUS Interactive Software (OPUSi)	• Maintenance/Upgrade Licenses (MUL)
• OPUS Control Station Emulator (CSE)	• OPUS Advantage (OA)
• OPUS Lite (OPUSL)	**Training Classes**
• OPUS Data Preparation System (DPS)	• OPUS Interactive User's Course
• OPUS Software Developer's Kit (SDK)	• OPUS-CSE Researcher's Course
• OPUS API Run Time (RL)	• OPUS Software Developer's Course
Available Formats: PC (Microsoft Windows and Linux), Mac (OS X) on request	
Discount Pricing Plans	
• Enterprise Agreement (EA)	• OPUS Companion License (CSL)
Surcharge if Export License is Required	
• ORCA will file necessary paperwork.	• There can be significant delays as we seek approval.

Information Technology Software

Standard Licenses (SL)

Standard Licenses are for a single installation, and can be purchased for the following OPUS products: OPUSi (Interactive), OPUS CSE (Control Station Emulator), OPUS Lite, OPUS DPS (Data Preparation System), and OPUS SDK (Software Developer's Kit).

OPUSi is the ORCA Planning and Utility System interactive mission planning and analysis software. The OPUS DPS provides data preparation tools that can be used for both OPUSi and the OPUS SDK. The OPUS SDK includes the Application Programmers Interface (API). It gives the user tools to build new applications that reference OPUS functions. The SDK includes one Run Time License which lets users run those OPUS API applications.

Standard Licenses (SL)		
Item	**Catalog Number**	**Catalog Price**
OPUSi (Interactive)-Windows/Linux	OPUS20-SL	$18,000.00
OPUS CSE-Windows/Linux	OPUS70-SL	$15,000.00
OPUS Lite-Windows/Linux	OPUS60-SL	$6,000.00
OPUS DPS-Windows/Linux	OPUS30-SL	$3,000.00
OPUS SDK-Windows	OPUS40-SL	$12,000.00
OPUS SDK-Linux	OPUS41-SL	$12,000.00

The Standard License gives the right to use the purchased software and service packs. Included with the software is online help and tutorials. Eight hours of e-mail and telephone support [within a one-year period] is also included.

OPUS API Run Time License (RL)

The OPUS API Run Time License is applicable to non-ORCA developed software applications that make use of the OPUS API. The OPUS API Run Time License gives the user the right to use their developed software application on a single machine.

API Run Time License (RL)		
Item	**Catalog Number**	**Catalog Price**
OPUS API-Windows	OPUS50-RL	$5,000.00
OPUS API-Linux	OPUS51-RL	$5,000.00

Maintenance Software

Maintenance/Upgrade Licenses (MUL)

After one year (but within two years) of the original purchase, Maintenance/Upgrade Licenses are available at 40% of the current list price of the product. This license provides for an additional eight hours of technical support within a one-year period, and an upgrade to the latest software version.

Maintenance/Upgrade Licenses (MUL)		
Item	**Catalog Number**	**Catalog Price**
OPUSi (Interactive)-Windows/Linux	OPUS20-MUL	$7,200.00
OPUS CSE -Windows/Linux	OPUS70-MUL	$6,000.00
OPUS Lite-Windows/Linux	OPUS60-MUL	$2,400.00
OPUS DPS-Windows/Linux	OPUS30-MUL	$1,200.00
OPUS SDK-Windows	OPUS40-MUL	$4,800.00
OPUS SDK-Linux	OPUS41-MUL	$4,800.00
OPUS CSL - Windows	OPUS2040-MUL	$10,000.00
OPUS CSL - Linux	OPUS2041-MUL	$10,000.00

OPUS Advantage (OA)

Customers can lock-in their software investment at a reduced cost by participating in our OPUS Advantage plan. This is an alternative purchasing plan that provides customers with more software updates and additional technical support. A one-time fixed fee of 20% of the original purchase price for all software, paid at the time of the original purchase, will entitle the customer to new version upgrades and Service Pack Updates released within the two (2) year period beginning at the original purchase date. In addition, OPUS Advantage customers are entitled to 16 hours of email and telephone support within a two year period (twice as much as the standard license).

OPUS Advantage (OA)		
Item	**Catalog Number**	**Catalog Price**
OPUSi (Interactive)-Windows/Linux	OPUS20-OA	$21,600.00
OPUS CSE -Windows/Linux	OPUS70-OA	$18,000.00
OPUS Lite-Windows/Linux	OPUS60-OA	$7,200.00
OPUS DPS-Windows/Linux	OPUS30-OA	$3,600.00
OPUS SDK-Windows	OPUS40-OA	$14,400.00
OPUS SDK-Linux	OPUS41-OA	$14,400.00

Training Classes

OPUS Training Courses at ORCA offices in Whittier, California

ORCA offers three training courses: the OPUS Interactive User's Course, the OPUS Control Station Emulator Researcher's Course, and the OPUS Software Developer's Course. Prices shown are Net Prices Per Attendee and are due before the class is held. Each course provides approximately 16 hours of student instruction. Class size is limited to **four** students. Hands-on exercises are tailored for each class.

OPUS Training Courses (TC)		
Course Description	**Catalog Number**	**Catalog Price**
OPUSi (Interactive) User's Course	OPUS20-TC	$1,950.00
OPUS CSE Researcher's Course	OPUS70-TC	$1,950.00
OPUS Software Developer's Course	OPUS40-TC	$2,450.00

OPUS Training Courses at other than ORCA offices

When training is given at ORCA, we are able to use multiple trainers for the hands on exercises, and multiple experts to give presentations in their specialties. We are convinced that students learn more when they travel to ORCA for their classes.

OPUS Technical Support

Technical support is available for products via our web site located on: **http://www.ORConceptsApplied.com**

Technical phone support is available from 9:00 AM to 5:00 PM Pacific Time, Monday through Friday, (562) 907-6700, x62. Software help is available in online files provided with the software. Users are encouraged to review this documentation as well as availing themselves of our technical support.

OPUS Discount Pricing Plans

Enterprise Agreement

ORCA offers a volume-purchasing program called Enterprise Agreement (EA). The Enterprise Agreement is an easy and affordable way for customers who have requirements for multiple licenses of OPUS technology. The Enterprise Agreement offers discounts that increase as dollar volumes increase, easy order fulfillment, and other benefits. Under ORCA's Enterprise Agreement, discounted prices are based on the committed dollar amount of software purchased. Prices on subsequent orders to meet the commitment will apply to orders within the same product pool throughout the Enterprise Agreement one-year term.

For dollar volume purchases under the Enterprise Agreement (EA) for OPUS Interactive, OPUS CSE, OPUS DPS, OPUS Lite, and OPUS Software Developer's Kit (SDK) products, ORCA offers the following discount schedule:

Volume Purchase	Discount
$100,000 - $199,999.99	10% of amount over $100,000
$200,000 - $399,999.99	$10,000 plus 20% of amount over $200,000
$400,000 - $799,999.99	$50,000 plus 30% of amount over $400,000
$800,000 & Above	$170,000 plus 40% of amount over $800,000

For dollar volume purchases under the Enterprise Agreement (EA) for the OPUS Application Programmers Interface (API) Run Time Licenses only, ORCA offers the following discount schedule:

RL Volume Purchase	Discount
$200,000 - $399,999.99	10% of amount over $200,000
$400,000 - $599,999.99	$20,000 plus 20% of amount over $400,000
$600,000 - $899,999.99	$60,000 plus 30% of amount over $600,000
$900,000 & Above	$150,000 plus 40% of amount over $900,000

OPUS Companion License (CSL)

Instead of the Volume Discounts listed above, the OPUS Companion License (CSL) purchasing plan allows customers to receive an alternate discount from the original combined catalog prices of OPUSi (Interactive) and the OPUS Software Developer's Kit (SDK) licenses by ordering them as a set and purchasing them together.

OPUS Companion License (CSL)		
Item	**Catalog Number**	**Catalog Price**
OPUSi (Interactive)-Windows/Linux **and one** of the following:	OPUS20**XX**-CSL	$25,000.00
OPUS SDK-Windows	OPUS20**40**-CSL	
OPUS SDK-Linux	OPUS20**41**-CSL	

OPUS Export Surcharge

OPUS software and related services [with the exception of OPUS Lite] have military applications and are subject to International Traffic in Arms Regulations [ITARS]. Only United States persons may acquire these products without licenses and other State Department approvals. There is a significant effort in both time and resources in securing an Export License when one is required. This has forced us to add a surcharge of $8,000.00 or 10% of the total sale volume, whichever is greater, to all sales that require an export license.

All prices and items listed in this catalog are subject to change without notice.

OPUS System Requirements

The computer system software and hardware configurations are primarily driven by the requirements specified to run the system OS. The system requirements for OPUS are delineated according to operating system.

Microsoft Windows Workstation:

Minimum System Requirements:

- Intel® Core™ i3
- 2.0 GHz or comparable processor
- 1 GB RAM (OPUS Interactive)
- 1 GB free hard disk space (Typical Installation)
- CD ROM
- Windows XP, Vista

Recommended System Configuration beyond that of above:

- Intel® Core™ i5 / quad core or better (2.5 GHz+)
- 4 GB or more of RAM
- 4 GB free hard disk space (Full Installation)
- Windows 7 Operating System

Linux PC:

- OS: Any current Linux (Ubuntu, Mint, openSuse, Debian, Fedora, CentOS, etc.)
- Memory: Same as OPUS Interactive on Windows
- Disk: Same as OPUS Interactive on Windows
- Processor: Same as OPUS Interactive on Windows

Other Operating Systems:

- Ask us
- Prices may vary

ORCA also recommends dual monitors although it is not required. The more pixels you have, the better you can handle displaying the map and the dialogs associated with the application's services.