

## Reducing the Complexities of Integrating Suborbital Capabilities

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Managing the complexities of suborbital systems is among our most daunting challenges. One of the key features of reducing complexity and facilitating integration of systems is a vast simplification of the software architecture. A novel, object-oriented programming language (COOP-ER™) can reduce the application footprint from, for example, 50 to 100 megabytes down to roughly one (1) megabyte. This reduced application footprint allows for sharply reduced power consumption, greater program stability, greater ease of integrating system components and new devices, and reduced development times. In addition, this platform is extremely front-end friendly. It can be taught to investigators in as little as 8 weeks, so that programming can more easily enter the hands of those with the core knowledge in their respective discipline

This new programming language is coupled with a novel database structure called Omnidex™, which is a robust search/find engine that enables more efficient parallel management of high dimensional data. It is a hybrid of capabilities that integrate traditional database structures and retrievals, combined with free-text and the inclusion of massively large numeric data fields. Another feature of this database architecture is the capacity to “report out” the variables most responsible for the change under various conditions, which can be used to augment traditional data reduction techniques like principal components analysis (PCA).

When integrated with a paired photon-based communication network (optical multiplexing), this synthesis of technologies allows for cross-platform applications that can address numerous challenges within the ground-based and flight-based suborbital environment. The footprint of all underlying technologies is highly compact, taking a fraction of the space compared to any conventional technology and associated applications, while delivering extraordinary sophistication. As such, it is possible to deliver state-of-the-art software on computers the size of an iPhone.