ST. Mark’s TS Procedurals (1/9/12)

## Shameless Plug

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## T Beyond – SSA Specific

**“Beyond” means outside the limit of**

**OED 89** (Oxford English Dictionary 1989 Second Edition <http://oed.com/view/Entry/18511?redirectedFrom=beyond#eid>L.F.)

a. Outside the limit or sphere of, past; out of the grasp or reach of.

**SSA is below the mesosphere**

**CPI 10** (Computational Physics Incorporated, “Space Situational Awareness”, http://www.cpi.com/capabilities/ssa.html, ZBurdette)

The overall objective of space situational awareness (SSA) is to know the location of every object orbiting the Earth, to know why it is there, what it is doing now, and predict what it will be doing in the future.It is the ability to track and understand what exactly is in orbit from either space or from the ground. This capability is needed to protect the extensive U.S. investment in space assets for weather, reconnaissance, navigation, and communications. These systems represent hundreds of billions of dollars worth of public and private investment and play a key role in the national economy, U.S. prosperity, and wealth creation.

Satellites from every nation naturally cluster in preferred orbits: Low Earth Orbit (LEO) for weather and reconnaissance, Medium Earth Orbit (MEO) for cellular telephone communication and navigation, Geostationary Orbit (GEO) for Global Positioning Systems (GPS) and communications, as well as Highly Elliptical Orbits (HEO) or Molniya Orbits for communications services and other uses at high northern latitudes. These preferred orbits are littered with spent rockets, dead satellites, and thousands of other bits of debris that are hazards to space operations. By charting and tracking, SSA helps protect space assets and ensure safe operations by providing warnings of potential hazards (natural or manmade, intentional or unintentional) in a manner timely enough to allow preventive actions to be taken.

The greatest challenge to SSA is the existence of totally unknown RSOs in space. These are natural objects like meteorites, debris from launch vehicles, or debris broken off from already orbiting assets. The proliferation of debris in space constitutes one of the primary threats to safe operation of spacecraft. This debris can range in size from the smallest particles to large objects such as rocket bodies. Given the high relative velocities (up to 16 km/sec) in potential collisions in space, even small debris (e.g., < 1cm diameter) can cause significant damage. Most of the 17,000 or so objects greater than 10 cm in diameter are regularly tracked and cataloged by the United States Air Force (USAF). However, there are more than 200,000 objects between 1 cm and 10 cm in diameter that remain largely untracked because of the difficulty in observing them. These objects propose a potential threat to U.S. space assets and the number continues to grow. Recent large jumps in debris have been caused by the destruction of the Chinese satellite in 2007, and the collision between the spent Russian Cosmos 2251 satellite and the Iridium 33 satellite in 2009. For safety and security, these objects must be detected, identified, and assessed without the benefit of any pre-conditional information such as cues or guidance.

The USAF currently tracks objects in space using a collection of ground-based telescopes and radars, one space-based sensor, and a control center in the Space Surveillance Network (SSN) that is maintained by U.S. Space Command. In general, ground-based radar is used to search and detect space objects because of their ability to perform a wide-area search over a large field of view with a single beam. Ground-based telescopes are used for space object characterization because objects beyond LEO are almost always illuminated by the sun and can be observed as long as the telescope is in the dark. The existing GEO search capability is provided by three Ground-Based-Optical Deep Space Surveillance (GEODSS) Systems. One drawback of telescopes is they are limited by the weather. Another drawback for both ground-based radar and telescopes is they lose track of objects that move temporarily out view, resulting in information voids that must be filled.

**Exploration requires sending spacecraft into space**

**Logsdon 11** (John M, Professor Emeritus of Political Science and International Affairs at George Washington University’s Elliott School of International Affairs (http://www.britannica.com/EBchecked/topic/557348/space-exploration)

Space exploration, the investigation, by means of manned and unmanned spacecraft, of the reaches of the universe beyond Earth’s atmosphere and the use of the information so gained to increase knowledge of the cosmos and benefit humanity. A complete list of all manned spaceflights, with details on each mission’s accomplishments and crew, is available in the section Chronology of manned spaceflights.

**Development requires human presence**

**Livingston 7** – former adjunct professor in the Graduate School of Business at Golden Gate University his doctoral dissertation was titled “Outer Space Commerce: Its History and Prospects” citing Eric Westling co-author of “The Space Elevator” and numerous papers on space tech and development [quals in card] (9/10/07, “This Week On The Space Show: Eric Westling”, http://www.thespaceshow.com/guest.asp?q=298) \*\*\*TRL stands for Technology Readiness Level

Eric Westling is a science writer, pundit on science, technology, and economics. He is the co-author of “The Space Elevator” with Dr. Brad Edwards . In addition, Mr. Westling is retired and is a former Army officer and helicopter pilot, civilian Airline Transport Pilot (ATP), former consultant to many small companies regarding engineering, computer, and business troubleshooting. His most recent papers are on Solar Power Satellites, Economics of the Space Elevator, Energy and time lag in the 21st century , and Eric’s axioms (a list of principles of science, technology and economics). Mr. Westling stats that “Space Development is the only long term answer to the, just starting, energy shortage; which will otherwise continue until we have an economic collapse.” He believes that no-one is doing space development . Instead, we have space technology, not development. NASA has no TRL 10 – therefore no plans to develop space . He defines space development as the rapid expansion of manned commercial projects in space.

## T Humans

**They’re not topical—Exploration requires direct human presence.**

**Wright 8** (Edward, Project Manager – Teachers in Space, Former President – X-Rocket, LLC, and Programming Writer – Microsoft Corporation, Comment on “A Move Against ‘Mars Mission Funding’”, Space Politics, 6-28, <http://www.spacepolitics.com/2006/06/28/a-move-against-mars-mission-funding/>)

> No it doesn’t, the article showed democratic support for further unmanned mars missions?

Unmanned missions are not exploration, they are merely reconnaissance. The dictionary defines exploration as “travel for purposes of discovery.” Sitting in a control room looking at pictures of Mars on a TV set is not exploration because it does not involve travel.

Calling unmanned space “exploration” and unmanned probes “spaceships” is just an attempt to co-opt the language.

Mark further confuses the issue by defined “space exploration” to mean only missions conducted by NASA, ignoring the fact that the private sector is also working on space exploration.

**So does development**

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## T Substantial

**The aff isn’t topical – a substantial increase in space development and/or exploration requires 2.6 billion dollars**

**Alexander, 8** (Amir, writer for the Planetary Society, “President signs NASA Authorization Deal,” October 16, 2008 from <http://www.planetary.org/programs/projects/space_advocacy/20081016.html>)

On Wednesday, October 15, 2008, President Bush signed into law the NASA Authorization Bill passed by Congress last month. By authorizing NASA to spend $20.21 billion in fiscal year 2009, the bill represents a substantial increase of $2.6 billion over the administration's budget request for NASA earlier this year. $4.9 billion of the bill's total is directed towards science operations, and another $4.9 billion is authorized for exploration. An authorization bill, unlike an appropriations bill, does not actually fund programs, and the spending levels it cites are not binding on NASA. Nevertheless it does provide the agency with spending guidelines and indicates Congress's priorities.

**Holding the line on substantial is critical**

**Devinsky 2** (Paul, “Is Claim "Substantially" Definite? Ask Person of Skill in the Art”, IP Update, 5(11), November, <http://www.mwe.com/index.cfm/fuseaction/publications.nldetail/object_id/c2c73bdb-9b1a-42bf-a2b7-075812dc0e2d.cfm>)

In reversing a summary judgment of invalidity, the U.S. Court of Appeals for the Federal Circuit found that the district court, by failing to look beyond the intrinsic claim construction evidence to consider what a person of skill in the art would understand in a "technologic context," erroneously concluded the term "substantially" made a claim fatally indefinite. Verve, LLC v. Crane Cams, Inc., Case No. 01-1417 (Fed. Cir. November 14, 2002). The patent in suit related to an improved push rod for an internal combustion engine. The patent claims a hollow push rod whose overall diameter is larger at the middle than at the ends and has "substantially constant wall thickness" throughout the rod and rounded seats at the tips. The district court found that the expression "substantially constant wall thickness" was not supported in the specification and prosecution history by a sufficiently clear definition of "substantially" and was, therefore, indefinite. The district court recognized that the use of the term "substantially" may be definite in some cases but ruled that in this case it was indefinite because it was not further defined. The Federal Circuit reversed, concluding that the district court erred in requiring that the meaning of the term "substantially" in a particular "technologic context" be found solely in intrinsic evidence: "While reference to intrinsic evidence is primary in interpreting claims, the criterion is the meaning of words as they would be understood by persons in the field of the invention." Thus, the Federal Circuit instructed that "resolution of any ambiguity arising from the claims and specification may be aided by extrinsic evidence of usage and meaning of a term in the context of the invention." The Federal Circuit remanded the case to the district court with instruction that "[t]he question is not whether the word 'substantially' has a fixed meaning as applied to 'constant wall thickness,' but how the phrase would be understood by persons experienced in this field of mechanics, upon reading the patent documents."