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Outer Space: Battlefield of the Future?

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likely to apply." Even after a demonstration of the "national leadership" approach as part of a three-pronged "multiple approach analysis" of the Soviet SS-6 program, one is impressed by Spielmann's virtuosity but somewhat at a loss about how to apply the approach oneself.

One of the telling points repeatedly made by Spielmann is the difficulty, given present research methods and materials, of reaching firm conclusions about Soviet strategic intentions. His emphasis on the need to pay greater attention to the personal preferences and perspectives of Soviet leaders might well be extended to call for much more systematic research on what the Soviets themselves have to say about strategic arms and military policy. In the absence of such data on Soviet perceptions, even the best of models will be of limited assistance in interpreting Soviet strategic arms behavior.

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Stockholm International Peace Research Institute. *Outer Space: Battlefield of the Future?* London: Taylor and Francis, 1978. 202pp.

Despite its catchpenny title there is little in this book on the lines of Major General Keegan's revelations on the great battle to be joined in space. It is a sober, perhaps too sober, attempt to describe what artificial earth satellites are capable of and how they are being used, in particular by the military.

At one level this book is very good indeed; a straight readthrough, ignoring the mathematics and the copious tables, but paying attention to the excellent, if occasionally rather small, diagrams will give the layman a useful basic background on satellites. It begins with a simple but clear explanation of orbital dynamics so that one can quickly grasp the capabilities and limitations of satellites, and for example realize that it is impossible for the Big Eye in the Sky to be omnipresent. The book goes on to describe the construction and use of reconnaissance/photographic, communications, navigation, meteorological and geodetic satellites. This is mostly factual and descriptive and contains much familiar material reprinted from the SIPRI yearbook, although there is some speculation both scientific and operational. Each section contains a description of appropriate nations' progress in the field and concludes with a table listing all satellites of each type launched as of the date of printing. The last two chapters are on hunter/killer satellites, FOBS and on general conclusions, and naturally contain much more speculation.

But rereading the book, one gets an uneven impression. Who is the mathematics aimed at? Some of it is derived from first principles, which anyone with reasonable numeracy can follow, but some equations are presented fully formed and some of these not in the way normally used by other workers in the field. One or two, I fear, are unsound and contain confusing misprints. On the operational side, too, faults can be found. For example, while it is agreed that three position lines are required for an acceptable navigation fix, the text gives the impression that a *Transit* fix depends on "sights" of three satellites simultaneously, whereas the *Transit* system works by the receiver computer integrating the relative position of one satellite during its 10 to 15 minute passage over the navigator's horizon. Further, the disadvantages of the *Transit* system are not brought out, e.g., the occasional gaps of 12 hours and the frequent gaps of 6 hours in coverage. Similarly when dealing with communications satellites, the problems arising from eclipsing, the power limitations on bandwidth for mobile earth terminals and the limited launch windows available are not developed. My U.S. Naval War College colleagues of 1974-76 also

will miss any reference to the vast expense of satellite launches to the secondary powers.

It is realized that SIPRI sees itself, and undoubtedly performs a useful function, as Cassandra telling of the dangers to peace of unbridled military expansion, but this can be overdone. While the use of satellites as "national means of verification" of the SALT treaties is recognized, nothing is said in this book of the improved command, control and communications offered by satellites. This improvement can give greater confidence to the leaders of both sides that their adversaries are in full control of their forces, thus reducing the possibilities of a war by accident. The warning note in this book is too constant and in the end, irritating. Sometimes the alleged conspiratorial acts of the military are introduced totally unnecessarily, as when it is stated that in 1964 "secrecy descended over the navigation satellite programme and the designation TRANSIT ceased to be used." This is nonsense. For at least the past decade manufacturers have been marketing *Transit* receiver systems openly, and by early 1977, 80 percent of the 1900 sets sold were being used by civilians in merchant ships, oil surveys and even transatlantic racing yachts. Unclassified references to *Transit* are easy to find and Strensell's article "TRANSIT, the Navy Navigation Satellite System" in the spring 1971 edition of *Navigation* is typical. This type of error is crying "Wolf!" and in the end one could be excused for losing confidence in other parts of the book.

However to return to its strengths, there is an excellent description of how the Russians elegantly solve the problem of Satellite Communications at high latitudes. This problem is also faced by most Western users who prefer for other reasons to use geostationary equatorial satellites, but is more pressing for the Russians because of their geography. The Russian Molniya system consists of a series of satellites launched into high-inclination, highly elliptic orbits with apogees over the northern hemisphere. The satellites thus spend about 11 hours of their 12-hour orbits in view from the U.S.S.R., orbital dynamics forcing them to spend only a short period at high velocity over the southern hemisphere. Another interesting description and set of diagrams shows how U.S. and Russian reconnaissance satellites were maneuvered to pay special attention to the Eastern Mediterranean in July 1974 at the time of the Cyprus Army coup and the subsequent Turkish invasion.

So SIPRI has produced a useful book of interest to all concerned in the technological fundamentals of military science, but leaves one looking for a better, more balanced text, that would deal with all uses of satellites, civil and military. Such a book would allow the reader to draw his own conclusions on the contributions of space technology to peace and war.

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Tran Van Don. *Our Endless War: Inside Vietnam*. San Rafael, Calif.: Presidio Press, 1978. 274pp.

Many Americans consider the Vietnam war to have been a tragedy in our national history that gave rise to many problems that are still with us today. However, the dimensions of that tragedy appear much greater when looked at from a Vietnamese perspective. *Our Endless War* is the account of the Vietnam conflict as seen by a former high-ranking South Vietnamese official intimately involved in it from the end of World War II until the fall of Saigon in 1975.

Tran Van Don largely attributes the victory of the Communists to two factors. First, the corrupt and repressive nature of the successive Saigon Governments prevented them from being able to organize effective domestic