

Chapter Six

Space-Based Weapons

On June 18, 1982, at the second United Nations Special Session on Disarmament (UNSSOD II) Prime Minister Trudeau called upon the world community to negotiate a treaty to prohibit the development, testing and deployment of all weapons for use in outer space. While it is generally assumed that there are at present no weapons based in space, there is and has been a considerable amount of research and development in the area of space-based weapons. This interest in the feasibility of the "weaponization" of space, as distinct from the militarization of space or the military use of space, has a reasonably long history. For example, when the Soviet Union's COSMOS 139 was launched on January 25, 1967, it was believed to be the first flight test of a Fractional Orbital Bombardment System (FOBS).

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In theory a FOBS weapon would be launched into a low orbit, travelling over the horizon towards US bomber bases. When in range, it would fire its retro-rockets and would drop towards its target with a 1- to 3-megaton payload. While in orbit, the FOBS would resemble an ordinary payload, requiring perhaps an hour to arrive in range of its target. Once out of orbit, the FOBS would give only 3 minutes' warning, much less than the 30 minutes for ICBMs. Although the USAF has over-the-horizon radars which bounce high-frequency radio waves off the ionosphere and can thus detect FOBS in orbit, those radars can be affected by sunspot activity and are highly susceptible to jamming. Optical systems are much better suited for FOBS observations. (A probable scenario for FOBS weapons would be multiple launchings to take out many targets. Although a single FOBS would be difficult to identify, it would be strategically improbable that only one would be used, with the result that there might be even more warning time than for ICBMs.)¹⁸

Although the FOBS has been operational for many years, a different kind of space weapon, the Directed Energy Weapon (DEW), has been described more often in the press. The most

heavily researched area of DEW development is that of the laser, and even it has received comparatively little funding: less than \$2 billion has been spent by the Pentagon since the 1970's on high-energy laser weapons. However, the allocation for laser weapon research has been constantly rising.¹⁹ The Soviet Union, too, has been pursuing DEW development. In fact one source has suggested that its laser weapons development programs are four or five times larger than those of the US, and that it presently has an operational low-altitude anti-satellite laser stationed at Sharyshgan.²⁰

The potential for laser weapons is indeed enormous. A photon takes only six-millionths of a second to travel one mile, so that an ICBM travelling at Mach 6 at a range of 1600 km would travel only 3 metres during the flight of a laser beam towards it. But the situation is not quite so simple; a laser weapon (*at the present time*) cannot simply be pointed at incoming ICBMs and vaporize its targets. A certain length of time is required for the beam to burn through the outer shell of the target vehicle. Once through the shell, the beam must strike a vital component such as a guidance circuit in order to be effective. Also, during its passage through the atmosphere, a laser beam will diverge slightly and be dispersed by the atmosphere, so that the required "dwell time" on the target will be longer. Finally, the aiming and the disengaging mechanism must be extremely accurate in order to point the laser, distinguish targets, recognize when a target is disabled and move on to other targets.

Lasers can be defended against, at least to some degree. Cruise missiles, for example, are poor targets because of their erratic flight. The vital components of ICBMs can be shielded with highly reflective material, again increasing the required dwell time. Nevertheless, there is no question that the ideal medium for laser weapons is space because the atmospheric dis-

¹⁸ Brownlow, C. "Soviets Prepare Space Weapon for 1968", *Aviation Week and Space Technology*, 13 Nov. 1967, pp. 30-31.

¹⁹ Primary source: Payne, K.B., ed., *Laser Weapons in Space*, Westview Press, Boulder, Colorado, 1983. Also: Canan, J. *op.cit.*, note 16.

²⁰ Main, Roger P. "The USSR and Laser Weaponry: A View from Outside", *Defence Systems Review*, V. 3, no. 3, 1985, pp. 67-80.