

Both the United States and Soviet Union have reusable space vehicles. The American Space Shuttle program is a major success despite its development problems. The Soviet Albatros (or Raketoplan) has also met with some success, although it is not widely publicized. Both vehicles can transport payloads into orbit and can intercept satellites for inspection. This last point is very important in terms of military value.<sup>23</sup>

Because of the delicate and fragile nature of a satellite payload, any deviation from 100% efficiency can be severely disrupting. Consequently, ASAT systems need not be very sophisticated: the simple collision with an "unarmed" ASAT missile would probably be sufficient.

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Soviet ASAT technology is well ahead of any similar American effort. In 1976, the Soviets began a series of "killer satellite" tests employing target-seeking "oversized grenades" that could intercept a target in space. And, in 1981, the highly classified TEAL BLUE and TEAL AMBER tracking cameras (of the GEODSS advanced system) reportedly photographed ASAT launching tubes on Cosmos 1267 that docked with Salyut 6. This gave rise to the report that the Soviets were preparing to run an orbiting, anti-satellite "battle-station".<sup>24</sup>

The United States has been developing an ASAT capability in response to the Soviet system, but using a different technology. On January 21, 1984, an F-15 over the USAF Western Test Range launched an unarmed, two-stage Short-Range Attack Missile (SRAM) into space to test its guidance system.<sup>25</sup>

In all likelihood, despite these developments, the age of the space battle-station (the "Deathstar") is not quite upon us. Neverthe-

less, large ASAT bases are probably in the planning stages in both the US and the USSR. It is known, for example, that the Soviets are moving towards a permanent space station. It would be supported by the Progress unmanned "supply tug", reached with the new Soyuz-T manned vehicle, and may be an adaptation of the Cosmos 1267 "space station module".<sup>26</sup> It has been claimed that the "module" is nothing but a "cover-up" for a huge ASAT station. Telemetry from Cosmos 1267 is reported by the amateur Kettering group to be of a kind unmatched for other Cosmos flights.

Finally, there is the curious report that the Soviets have developed an immense particle-beam installation for defending against American ICBMs. According to USAF intelligence sources, a secret base has been built at Semipalatinsk in Kazakhstan. Deep underground is a large steel sphere connected to a magneto-hydrodynamic generator. Supposedly, a small nuclear device could be detonated in the sphere and the energy transferred through the generator into an accelerator where a proton beam would be produced. The physics of the system is not impossible, only beyond present capabilities. But the strategy in employing such a system appears skewed, since it is vulnerable to many countermeasures. Furthermore, a beam weapon with a "nuclear bomb" power source produces an unnecessarily strong proton stream according to critics (though perhaps the critics are overlooking the fact that a very powerful beam would carry several advantages over one produced more conventionally).<sup>27</sup> As mentioned earlier, although the placement of such a system on board a satellite is possible in theory, the satellite itself would be extremely vulnerable to ASAT weapons.

<sup>23</sup> For details on the Soviet shuttle, see Covault, C. "Soviets Orbit Shuttle Vehicle", *Aviation Week and Space Technology*, 14 June, 1982, pp. 18-19. Also see Humble, R.A. "The Soviet Space Shuttle and Related Military Developments", *Canadian Defence Quarterly*, V. 12, no. 3, 1982/83, pp. 30-33.

<sup>24</sup> Powell, J.W. "Photography of Orbiting Satellites", *Spaceflight*, V. 25, no. 2, 1983, pp. 82-83.

<sup>25</sup> The ASAT test was noted in *Aviation Week and Space Technology*, 30 Jan., 1984, p. 19.

<sup>26</sup> A good view on Soviet space development is that of Oberg, J. "Soviet Developments Point for Space Operations Center", *Astronautics and Aeronautics*, May 1982, pp. 74-77.

<sup>27</sup> Douglas, J.H. and Thomsen, D.E. "The Great Russian 'Death-Beam' Flap", *Science News*, V. 111, 21 May, 1977, pp. 329-335.

