b) *Space Surveillance and Tracking System (SSTS)*: uses cryogenically-cooled, long-wavelength infra-red sensors to detect and track warheads and decoys during the mid-course phase; will be able to discriminate targets from decoys based on only slight differences in their thermal signature.

c) *Airborne Optical Systems (AOS)*: a modified Boeing 767 that will carry two mid-wavelength infra telescopes for tracking and identification of warheads in the mid-course and terminal phase.

d) *Terminal Imaging Radar (TIR)*: a long-range, X-band radar to enhance target/decoy discrimination during terminal phase, in support of the High Endo-atmospheric Defence Interceptor (HEDI) [see KEW].

II. Directed Energy Weapons (DEW)

A) ***Definition***: "directed energy" refers to weapons which use a stream of sub-atomic particles or electromagnetic radiation to attack and destroy the target. DEW are planned for use against ballistic missiles in the boost phase and post-boost phase of their trajectory.

B) ***Research Activities***:

1) **Space-based Laser System**: includes the following components:
   a) a deuterium fluoride (D_2F) infra-red laser which must be able to generate 5 megawatts of power for space tests;
   b) a telescope for tracking and assigning the target missile;
   c) a mirror, four metres in diameter, to direct the laser beam at its target.

2) **Ground-based Laser System**: consists of
   a) excimer and free-electron lasers (FEL), producing beams of shorter wavelengths (visible and ultra-violet), to be installed on the ground;
   b) space-based relay mirrors to direct the laser beams to their targets;
   c) computerized optical technologies which are designed to compensate for distortion of laser beams as they travel through the atmosphere.