advantage of this system is its ability to provide real-time data with a computer-managed instantaneous video display of surveillance data, but it is still dependent on clear weather and illumination of satellites. Its memory will be able to alert the user to the discovery of new space objects. Other SPADATS sensors include those of the Naval Space Surveillance System and electro-optical sensors. A Pacific Radar Barrier (PACBAR) is planned and this system will be able to determine the orbit of a satellite within its first revolution. Other radar systems also assist in space surveillance.

Nuclear Detonation Monitoring:

Monitoring the nuclear detonation activities of other countries can provide intelligence related to compliance with the TTBT's 150 kiloton limit and the LTBT's prohibition of non-underground explosions. It can also provide information on nuclear weapon characteristics so that countermeasures can be developed. The American VELA program was designed to detect underground nuclear explosions, atmospheric and space detonations with ground-based monitors and space detonations with space-based detectors. The Vela Hotel satellite is the main component of the overall US nuclear detonation monitoring capability. These satellites carry x-ray, gamma ray and neutron sensors, optical and electromagnetic pulse sensors, background radiation counters and logic circuitry to discriminate between natural events and man-made radiation. Two other satellite systems, the Defense Support Program (DSP) Satellites and the NAVSTAR Global Positioning System (GPS), will take over nuclear detection monitoring as the VELA satellites come to the end of their life.

Aerial sampling is used to detect atomic particles released by a nuclear explosion. The HC-130 aircraft uses a seawater sampler to detect possible underwater nuclear tests.

Underground nuclear tests can be detected by seismic monitoring. At distances less than 625 miles from an event, detection methods can distinguish explosions greater than a few kilotons from earthquakes. Such distinctions are more difficult to make as distances become greater. Using several seismometers in an array can enhance the signal-to-noise ratio. The seismic arrays and seismometers operated by the Air Force Technical Applications Center are located at nineteen sites throughout the world. A Remote Seismic Test Network (RSTN) has been established by the US Department of Energy to evaluate possibilities for an "in-country" system to monitor a CTBT. The RSTN consists of five stations in the United States and Canada positioned about 2,000 kilometres apart (see abstract K56(A83)). Research is being conducted on an ocean-bottom seismic sensor system involving the deployment of seismometers in boreholes beneath the sea floor in international waters.

The Limitations of Technical Collection Systems:

The limited number of collection systems cannot provide complete 24 hour coverage of all targets of interest. Continuous monitoring of all points would require extensive processing operations and would be very costly. US plans to increase coverage by developing a KH-X satellite were abandoned because of excessive processing and analysis requirements. SIGINT systems also can monitor only a limited number of targets at any given time.