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# COMINT And Rapid Reporting Interferometry Experiment (CARRIE)

## Abstract

**Speakers**

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**Introduction**

(S-B) CARRIE, also known as DARPASAT in the unclassified arena, is a new small satellite that was successfully launched on 13 March 1994. It was one of two payloads on the first of ARPA's new TAURUS launch vehicles. CARRIE attempts to demonstrate that a small, inexpensive satellite can use single-vehicle interferometric techniques, coupled with an onboard processor, to quickly geolocate a limited set of targets and directly download the results to a tactical user in the field.

**Background**

(S-B) The Advanced Research Projects Agency (ARPA) has been actively investigating and developing lower cost, quick reaction launch capabilities for military support since 1988. In the course of this research ARPA determined it would be advisable to incorporate useful, tactically-oriented satellites as payloads for the first of the new TAURUS launch vehicles. CARRIE is the first such satellite, for which ARPA has combined resources with the NRO and Army (ASPO). Upon consultations with NSA, was chosen as a feasible, single-vehicle geolocation technique.

**CARRIE Description**

(S-B) CARRIE uses two flat spiral antennae, that are each three feet wide and separated by about 6.2 feet. It searches for CW signals in the 100-850 MHz range. CARRIE then uses an onboard processor with a TI/C30 to identify and geolocate signals. The satellite can detect energy of a given frequency; in a limited fashion determine the modulation and baud rate; and identify the signal based on the measured parameters. All of this information is processed onboard, available for immediate downlink to either a remote ELINT Processing and Dissemination (EPDS) van or one of the Remote Tracking Stations (RTS). CARRIE takes either thirty or sixty measurements a spin and has a spin period of approximately three seconds. A look-ahead and geolocation of one to two signals is performed with each separate spin.

**CARRIE Status**

(S-B) The Launch was successful and all important hardware and software components appear to be functioning correctly. The onboard processing and direct downlink of location reports has also been successful. Preliminary calibrations show that geolocation accuracies of approximately are possible during periods of good geometry and low interference. A very detailed data assessment phase has just begun; a complete set of metrics on data quality should be available by June '95.

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