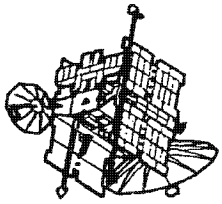
Section VI: SPACECRAFT

In February, the Mission 7300 program had four satellites in orbit: RAQUEL 1A (burned in Feb. 22), FARRAH I, FARRAH II However, only FI, FII,

Each spacecraft is in a near-circular orbit ranging from 249 nm (RAQUEL 1A) These spacecraft are spin stabilized so that the vehicle's spin axis position is near polar for optimal coverage of the Northern Hemisphere while permitting world wide access. The RAQUEL and FARRAH spacecraft are configured with deployable, high-gain narrow beamwidth parabolic reflectors and low-gain omni-directional antennas. The high-gain dishes are used in determining signal location from target emitter sidelobes, while the low-gain omni-directional antennas are used to collect target emitter mainbeams and to provide sidelobe inhibit protection for the high-gain dishes.

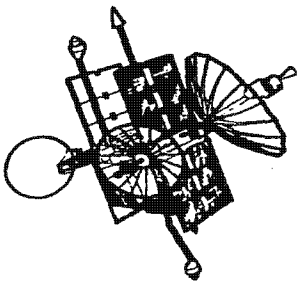
Mission 7300 utilizes both the Consolidated Space Test Center's and the Air Force Satellite Control Network's (AFSCN's) resources for command, status telemetry, and payload transmissions. Readout of wideband payload data occurs at remote tracking stations and is relayed in real, or near real time, via communications satellite for processing, analysis, and data reporting.

The following is a brief description of each Mission 7300 spacecraft and the payload objectives.

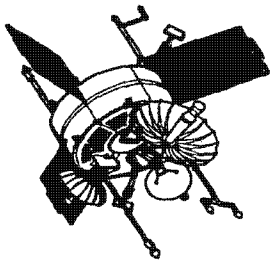


RAQUEL 1A (Mission 7345) - Re-entered the atmosphere on 22 February 1992. (See Appendix A for Mission History.)

FARRAH I and FARRAH II (Missions 7346/7347) - The primary mission of FARRAH is to acquire data to satisfy General Search (GS), Operational ELINT (OE), and Technical Intelligence (TI) requirements on signals in the 2-18 GHz frequency range. General Search requirements include high priority Soviet, Chinese and other di-



ments and is generally against known high priority signals and new signals discovered through the search process. A high gain antenna subsystem provides sidelobe intercept of emitters and a low gain antenna subsystem provides near horizon-to-horizon coverage of intercepts of emitter mainbeams.



25X1

25X1

A predetection analog output provides information on carrier modulation and other possible unique characteristics of either pulsed or CW signals.

Geopositioning accuracies using the Direction Finding Signal Processor (DFSP) for FARRAH I vary from for pulsed data and for CW data, depending on frequency at a 600 nm slant range. Geopositioning accuracies using the DFSP for FARRAH II vary from for pulsed data and nm for CW data, depending on frequency at a 600 nm slant range.

25X1

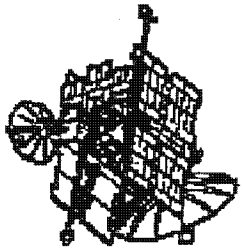
25X1

25X1

25X1

25X1

Appendix A: Vehicle and Payload Status



RAQUEL 1A (M7345)

HISTORICAL PERSPECTIVE

- Mission 7345 was launched on 16 March 1978 with a projected life expectancy of approximately three years. The primary mission of this vehicle was to continue the M7300 search capability, with emphasis on the geolocation and identification of new or unusual signals in the target environment from 8 to 18 GHz and to collect mainbeam technical intelligence from signals of interest (SOI) in the 4 to 18 GHZ frequency range. The secondary mission was to provide EOB information for emitters in the 4-18 GHz frequency band. It also proved very successful in collecting low powered CW signals and associated baseband structures/signal content samples, and high PRF pulse doppler radars.
- By 15 May 1978, all engineering tests were completed, the system was declared fully operational, and time critical reporting (TCR) procedures for North Korea, the Middle East and the Ethiopia-Somalia border were implemented.
- This system made significant and unique contributions to the exploitaion of
- RAQUEL 1A's (R1A) CW intercept capability was demonstrated by the detection and identification of deployments of In particular, R1A geolocated the

25X1
25X1
25X1
25X1
25X1
25X1

25X1

- **M**7345 intercepted and geolocated up-links from Afghanistan which coincided with the initial equipment detection from OVERHEAD photography that indicated the establishment of a [redacted] The same was true when, shortly after the influx of Soviet aircraft and materials, it geolocated a COMSAT uplink which was transmitting the [redacted] 25X1 25X1

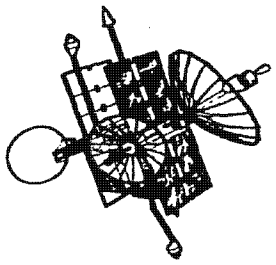
- **T**he vehicle was tasked to perform a search for continuous wave (CW) signals in Cuba that were associated with the [redacted] While tasked for the [redacted] 25X1 25X1 25X1

- [redacted] 25X1

- **D**uring the Falklands war, the flexibility of this system design allowed for attitude reorientation to provide coverage of the extreme southern latitudes. R1A's coverage of the Falklands area was possible while maintaining much of the usual northern hemisphere coverage. The southern hemisphere attitude maneuver was performed during 24 to 27 April 1982. This resulted in two to four passes a day of daytime coverage that provided high quality collection of [redacted] 25X1 25X1

- **O**n 5 March 1987 M7345 was put into caretaker status long after the specified life expectancy. Since this time, the system has been in and out of caretaker status. In August 1987, M7345 was reactivated in support of the [redacted] The data R1A collected, including the intercept of the [redacted] on 10 October 1987, was reported daily to the intelligence community. In October 1988, M7345 was again put into caretaker status. In September 1990, the site was prepared to reactivate M7345 in support of DESSERT SHIELD/STORM, but it was never deemed necessary. 25X1 25X1 25X1

- **M**7345 served the intelligence community well, providing valuable intelligence information long after projected life expectancy.



FARRAH I (M7346)

MISSION: **General Search, Technical Intelligence, and Operational ELINT; 2-18 GHz pulse and CW.**

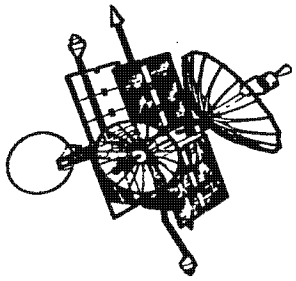
LAUNCH: **11 May 1982**

PAYLOAD STATUS: **Operational**

- **Band 8 DF inoperative**
- **Data handler anomaly - 28 October 1982**
- **Box C power supply anomaly - 16 December 1982**
- **Bit latch in the data handler - 21 Feb 85; 16 Feb - 26 Feb 88; 25 Oct - 31 Oct 89; and 24 Jan 91. A power cycle of the data handler reset these bits in each case.**
- Bias control lost on CW receiver 8 Sept 91. The receiver is now operating at the most sensitive level.

VEHICLE STATUS: **Operational**

- **Tape Recorder #3 failed on 22 March 87.**
- **Tape Recorder #1 failed on 30 July 88.**
- **Tape Recorder #2 failed on 21 Feb 91.**
- **Carrier 1 status link failure 11 May 89. Transpond tasking resumed 18 May 89.**
- **Monitoring of battery depth-of-discharge levels remain in effect to prevent possible Low Voltage Cut Off.**
- **Estimated burn-in date is after the year 2000.**



FARRAH II (M7347)

MISSION: General Search, Technical Intelligence, and Operational ELINT; 2-18 GHz pulse and CW.

LAUNCH: 15 June 1984

PAYLOAD STATUS: Operational

VEHICLE STATUS: Operational

- The Technical Intelligence (TI) receiver failed on 8 Dec 85. In March 87, the TI receiver appeared to operate normally during an engineering test and continues to operate normally.
- Tape recorder #3 failed on 08 Dec 88.
- Tape recorder #2 failed on 23 Sep 89.
- Tape recorder #1 failed on 23 Jan 91.
- Estimated burn-in date is after the year 2000.