[redacted]

1. In any assessment of the various EOB Satellite programs toward the fulfillment of the EOB requirements, certain basic limitations of each collection system must be recognized.

A. (1) The Tanion/Tripos system which uses a spinning satellite oriented so that the spin axis is at right angles to the direction of the orbital plane. The antennas will scan the earth at two areas exactly opposite each other, one in the northern and the other in the southern hemisphere. The period of collection usefulness will be limited to those times when the scanning antennas are over the areas of intrest. These two areas move around the orbit slowly thus the location accuracy inherent in the data from a particular area of intrest will vary greatly with the particular orientation of the spin axis to this target. As the targets of interest shift from higher to lower latitudes the EOB location accuracies will be highly dependant upon the orbital spin geometry. (2) The high gain collection antennas have through their side lobes the dangerous ability to also pick up some of the more potent signals thus giving rise to ambiguous data which clutter up the already very dense data stream.

(3) The emitter antenna scan characteristics are lost in this collection system through two means; the high gain of the collection system provides side lobe reception even when the emitter is not looking at the satellite and the collection systems' scanning obscures the emittor scan characteristics.

(4) This satellite collection system has yet to operate in the most dense populated spectrums where the data system will almost certainly be unable to handle the volumn of data present.

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The foregoing brief list of technical limitations is set forth not only to facilitate objective comparisons of current projects but more important to remind readers that the U.S. is still engaged in the TC&D phase of an overall ELINT satellite program. No one or combination of present techniques offers a satisfactory operational system; indeed, the limits of the state of the art are still to be observed.

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2. To better understand the limitations of each of the types of satellites in the EOS role the following must be recognized. In the Fenion / Tripos system the satellite spins hence its data stream is interrupted making it almost impossible to determine radar antenna rotation rates or any other slower occuring modulations in the data stream may not be recognized. In the Setter / Multigroup since they essentially look downward with high sensitivity they only see the side lobes of the radar. Antenna rotation rates and other forms of modulations in the antenna beams will not be present. In Poppy the system is limited in sensitivity so it only sees the main lobes of the Radar Beam. Its data is returned to earth in an analog form therefore it does give an indication of antenna rotation rate as well as faithfully reproduces the modulations present in the Antenna beams of the radars. When new signals incorporating new types of signal parameters they are most readily recognized in the Poppy data.

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In the Fanion / Trispoo system a high sensitivity receiving system is fitted with an antenna system which spin-scans in orbit. Because of the side lobe level in the spinning antenna and in the radar antenna, the receiver is cluttered with the continued presence of background signals. Also the desired data stream is ~~interrupted~~ interrupted because of the antenna spinning. These two factors make it difficult to observe any of the parameters or variations associated with antenna

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Criticism of Other Programs:

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1- [illegible] Frypes(?) & other Spinning Birds have in the past been plagued by:

1- Data received when bird looking away from the earth through hoggoten(?) antenna side lobes. This gives clutter to the beginning & end of the earth-horizon-to-horizon scan period

2- Payload spin axis such that North Latitudes scanned are inopportune or undesirable.

3- Data stream is extremely busy

4- Emitter antenna scan characteristic is lost ~~[illegible]~~ unless receiver sensitivity can be reduced periodically. Scan rate of Bird chops data also obscuring emitter scan characteristics.

5- Sensitivity so high only narrow portions of most dense spectrum are capable of being analyzed.

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