

ATTACHMENT 5

RELAY SATELLITE SEGMENT FUNCTIONAL REQUIREMENTS

1.0 INTRODUCTION

The purpose of this attachment is to provide the functional requirements for the Relay Satellite (R/S) segment of the EOI System for use in conducting Phase I System Definition studies.

2.0 CONFIGURATION A SYSTEM OPTION

The functional requirements for the R/S segment for the Configuration A system option shall be as specified in "Tentative Performance Requirements for the Relay Satellite System," 14 July 1970, Bye-107853-70. This Program Office document represents the current requirements being utilized in the Contract Definition Phase of the Relay Satellite segment development and will be updated prior to initiation of Phase II System Definition for the EOI System.

3.0 CONFIGURATION B SYSTEM OPTION

The Relay Satellite segment of the Configuration B system has not been defined and this is part of the Phase I System Definition studies.

The following is a partial list of R/S segment requirements. Additional requirements will be developed by the contractor during Phase I.

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GROUP 1
Excluded from automatic
downgrading and
declassification

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The R/S segment shall perform the following functions:

- Transfer wide band imagery data, telemetry and return ranging from the Imaging Satellite (I/S) segment to the Receiving Facility (R/F) segment.
- Transfer R/S telemetry and R/S return ranging to the R/F and transfer command and ranging information from the R/F to the I/S together with the command and ranging information required by the R/S's.
- Operate in orbit that provides either near global coverage or coverage of the Sino-Soviet area only.
- Utilize the minimum number of satellites required to relay I/S data.
- Include interchangeable satellites.
- Function so that the R/F can command, control and readout all satellites. In addition the R/S segment must interface in such a way that the R/F is capable of reading out the I/S directly or through a Relay Satellite(s).
- Be SGLS compatible for all command, control, telemetry and ranging functions.
- Employ inter-satellite channels, preferably on the

region) for

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reasons, and channels from any satellite to the R/F on band.

o Provide an capability for all command, control, telemetry and ranging channels during R/S launches or in the event of a failure in other than the communications channels.

o Have a on-orbit operational life.

o Provide support of its own command, control, telemetry and ranging functions when in view of R/F. Also, the R/S segment is to be capable of relaying these functions and imaging data from I/S's for up to 6 hours per day.

o Provide uninterrupted data flow through image data channel while an I/S is acquiring image data.

o A propulsion capability is to be available for: station keeping, repositioning to offset a R/S failure and to return a R/S to its original position in a two R/S system, and changing the orbit.

o Provide a search, acquisition, lock-up and auto-tracking sequence that is compatible with the I/S and R/F segments.

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- o Provide the capability for testing all primary functions in each R/S before launch and while on-orbit.
- o Relay imaging data without significantly degrading image quality.

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