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File

1 August 1969

Code 1000

Telephone conversation with RADM Moran (Navy Space Program Div., OPNAV)

1. I informed Admiral Moran that his proposed visit to NRL this morning was, unfortunately, inappropriate because of the involvement of virtually all desired participants in another meeting at NRL. It was agreed that the meeting with Admiral Moran would be deferred into next week or the following week and held at some mutually agreeable time.

2. Admiral Moran discussed in some detail the information which he would like to review at the time of the meeting. He specifically referred to the following items:

a. A review of the current existing requirement documents held at NRL and which presently form a basis for our system development and design. He emphasized his interest in requirements onboard. He did not want any external survey of the community to obtain such specifications.

b. He wished to review the difficulties experienced by NRL in meeting these requirements in all of their aspects; i.e., technical, administrative, organizational, political.

c. He desires to review existing documentation of the NRL technical package. He expressed an interest in the degree of such system and component documentation - whether it was adequate by conventional engineering standards, and up to date.

d. He desired to obtain an understanding of the time lag between the receipt of requirements and the completion of a technical package; what are the principal constituents of the development design and fabrication phase.

e. He desired an assessment of how well requirements have been met in past packages.

3. Admiral Moran appeared to summarize his comments with a statement that, although impressed by the briefings which he has heard to date by members of the NRL team, he is in fact more interested in learning about the problems which we have encountered in satisfying requirements laid upon us. That is to say, enough of how great it is; on this occasion let us address the difficulties associated with the effort.

[redacted]

Captain, USN
Director

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A. ~~Top Secret~~ A review of [redacted] current existing requirements documents held at NRL which form the basis for our system development and design:

[illegible]

Using Mission 7106 as an example the first guidance held at NRL reflects the Collection Guidance and Processing Guidance as promolgated by the USIB for all Satellite systems...ultimately the NRO places additional emphasis so that all programs do not concentrate on the same goal and leave other goals unattended. The historic USIB body which thus established the pecking order among the many targets was the Combined SIGINT Working Group (CSWG) and it was subordinate to the USIB SIGINT committee. Each Service had representation on this Working Group and it had a heavy CIA population. To the restraint imposed by Security clearance, NRL has not held the full document in its full unabridged version...instead we have had a clipped version and a message of exerpts. Throughout the life of this Mission on near-annual occasions the pecking order for Tasking-Priority of Mission 7105 has been promulgated and to the extent that 7105 is like the Mission 7106 then this guidance might extend as design guidance instead of just tasking guidance only.

Other Inputs to the Design Specifications with regard to Sensitivity of the ELINT Collection systems are derived from the Analysis community as they experience the suitability of the previous Mission in operation. This guidance also relates to the frequency coverage insofar as the analysis must be sensitive to the simultaneous intercept of related signals to determine the manner and extend of this relationship. The overall design criterion are thus evolved by community action

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[illegible] of Specification (Frequency)

CIWG

The [illegible] [illegible] as design emphasis

PSAC [illegible] Review = 11th hour Changes

(Sensitivity)

(1) Study of [illegible] data provides major clue. Calculations & state-of-the-art are the initial Basis for first attempt & the results relative to side-lobe intercept determine [illegible].

(2) Margin of safety in [illegible] - Threshold adjustment

(3) Analysis Community feedback.

(4) System Reliability Considerations

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Notes Relative to NSA Processing Specifications of 24 July 69 (2 Aug 69)

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1. PP 5.1.1 indicates that the greatly enhanced overall EOB capability This is true but the community seems to be satisfied with the EOB capability from [redacted] and offers to use 7106 only about 10% of the time for EOB.

5.2.1 gives the Analog site capability as only one [redacted] on each Rev....how about forgoing the location capability at analog sites and let them collect A and C or B and D or A& D or B &C???? Thus if one assumes that A sees all the data that B sees recording both and ignoring C & D is somewhat expensive unless the location potential is great enough to offset the value of General Search (One-Ball).

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NOTES RELATIVE TO ADM MORAN'S QUESTIONS. . . . . 6 August 1969.

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1. EXISTING REQUIREMENTS DOCUMENTS WHICH ARE BASIS FOR SYSTEM DEVELOPMENT AND DESIGN...

A- USIB Requirements for OVERHEAD ELINT collection and processing.

B- SORS (of SIGINT Committee of USIB) Tasking Priorities and MISSION Guidance

C- NATIONAL RECONNAISSANCE OFFICE (NRO) Design emphasis to support their total resource compliment.

D- ANALYSIS COMMUNITY design details relative to sensitity
Frequency coverage
parametric options.

E-

2. NRL DOCUMENTATION IN RESPONSE TO THESE INPUTS:

A- Concept

B- Detailed Design Goals — LONG LEAD-Time procurements

C- Costing Elements/FY — Sub-system development

D- Preliminary Tech Desc. — Final Sub-system design.

E- Up-dated " " " — Pre-Flight System tests

F- Final Technical Desc.

D E P L O Y M E N T I N T O ORBIT.

G- Operational Evaluation

H- Engineering Restraints

3. Operational Data Collection Site support.

A- Analog System

B- Digital System

Quality Control

Analysis systems

C-

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Difficulties in meeting these Requirements in all Aspects TECHNICAL.

1. Parametric measurements accuracies and tolerances are ridiculuous for a system which is Wide-Open in Frequency.

2. The spectrum coverage attained in this system per spacecraft has imposed tremendous design requirements upon the intercept antenna system. To get about 80 individual intercept-antenna elements on one spacecraft when they all influence each other by mutual coupling etc has certainly become one of the major design challenges especially when the intercept specification for the system must be documented to a very high degree of accuracy.

ADMINISTRATIVE DIFFICULTIES....

The major difficulty in this area is with regard to the lack of control over the analysis community...POOR EXPLOITATION has been the Par for this course. NSA recently (Nov 68) realigned their resources so there are for the first time in History, Processing people dedicated to this program. This may help but it has not been a strong indication in this direction...just more Meeting attenders who must be educated.

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DOCUMENTATION OF NRL TECHNICAL PACKAGE ...Degree and adequacy of both SYSTEM AND COMPONENT DOCUMENTATION

SYSTEM LEVEL DOCUMENTATION for Mission 7105 as an Example since it has been deployed.

Spacecraft

DATA LINK subsystems

Housekeeping Subsystems.

Interrogation SYSTEM for Sites

Receive and Record (Red and Green systems) for sites.

Analog to Digital System

Computer System with peripherals.

Software subsystems.

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In order to appraise the time lags between the receipt of the specifications and the completion of the total package, consider Mission 7105. The ABM/AES PSAC Review of Dec-66 and Jan 67, set many efforts in motion which impacted this program rapidly approaching a Feb 67 anticipated Launch date...Requirement for [redacted] coverage over the spectrum then though most likely to embrace the elements of The soviet ABM hardware. This caused NRL to add the coverage in one Spacecraft from 196 to 550 MHz plus 920 to 1800 Mhz and only the latter band in the second Spacecraft. More importantly the impact was felt in the Ground Station by the requirement to perform Geographic-Location Sort on the data collected at the site...This demanded a small computer and an A-to-D data conversion system. This system was deployed in April 67 complete with Software which worked surprisingly well when the initial GREEN-LIGHT go-ahead was obtained only on 21 December 66. This Computer and A-to-D system has had the most major effect on the program and its potential for the future.

Normally the documented USIB guidance is received, a Concept written by NRL and debated through a major segment of the community, a detailed Design goal statement written and the"approval to proceed"obtained. The development cycle for the K-Band systems has been at least 24 months. In other words it is now Contractor limited and can be improved by getting the guidance on the State-of-the-art portions of the spectrum identified and approved early so that the Launch and evaluation phases of the current Mission will not delay the preparation of the next Mission.

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THE DEGREE TO WHICH THE REQUIREMENTS HAVE BEEN MET BY NRL IN PAST PACKAGES?

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1. NRL Has exhibited an outstanding degree of flexibility without the normal attendant escallation of cost/to be responsive in order to the latest requirements wwhich are levied on this program by the National Priority listing of ELINT collection and analysis of the data derived.

In the area of Measurement accuracy for the various parametric options, POPPY has achieved or exceeded all except that of determination of frequency of the intercept, No attempt has been made to determine the polarization of the intercepted signal until Mission 7106 presently being prepared for Launch.

Location accuracy has surpassed that of many other programs/ independant of freq.

Measurement of Antenna Scan characteristics outstanding attribute.

MAJOR DIFFICULTIES:

Too few good people and trouble holding them.

As an example we lost a prime candidate to NASA because he could work on an"interesting space program".

Each of the Senior men on this program is carrying too heavy a burden to do total justice to the great variety of technical problems.

Inequities in allocation of Building Space, Personnel Hireings, Secretarial and clerical Support as well as the need for junior staff engineering support to grow into a solid team.

Major area of endeavor now being entered into is that of Spacecraft ELINT-evaluation and calibration in flight to detect small thresholdigg changes and the associated time delays caused by these changes.

Need for a local Domestic R & D site to make these measurements, provide the test bed for all hardware and Software destined for overseas use, Provide the basis for personnel Training, Development of Standard Operating Procedure and basis for establishing Logistic Support and maintenance SOP.

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