

NOT APPROVED FOR  
RELEASE 17 September 2011

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CORONA/GAMBIT/LANYARD

HANDLE VIA BYEMAN-TALENT/KEYHOLE-  
COMINT CONTROL SYSTEMS JOINTLY

Copy No. 1 of 75  
BYE-4590-64

USIB-D-41.13/11  
(COMOR-D-13/16)  
27 July 1964  
Limited Distribution

*Approved by USIB-D-41.13/12  
attached*

**IN FILE**  
NO. 1112

UNITED STATES INTELLIGENCE BOARD

MEMORANDUM FOR THE UNITED STATES INTELLIGENCE BOARD

**SUBJECT** : Long-Range Requirements for Satellite  
Photographic Collection

**REFERENCE** : USIB-D-41.13/10 (COMOR-D-13/14)  
24 July 1964, Limited Distribution

1. The enclosed report on the subject from the Committee on Overhead Reconnaissance (COMOR), in response to USIB action in Executive Session at its 22 July meeting as recorded in the reference, is transmitted herewith for consideration by the Board of the COMOR. Conclusions and Recommendations contained in Tab B hereto, pages 6 through 10.

2. The National Photographic Interpretation Center (NPIC) study attached as Tab C hereto is being distributed in a limited number of copies primarily to USIB Members and Observers.

3. The enclosed COMOR report is scheduled for consideration by the USIB at its meeting on 29 July 1964.

*James S. Lay, Jr.*  
JAMES S. LAY, JR.  
Executive Secretary

Attachment with  
Tab A  
Tab B  
Tab C (TCS-7473-64)

HANDLE VIA BYEMAN-TALENT/KEYHOLE  
COMINT CONTROL SYSTEMS JOINTLY

LANYARD  
CORONA/GAMBIT  
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GROUP 1  
Excluded from automatic  
downgrading and  
declassification

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Handle via BYEMAN,  
TALENT-KEYHOLE  
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(COMOR-D-13/16)  
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UNITED STATES INTELLIGENCE BOARD  
MEMORANDUM FOR THE UNITED STATES INTELLIGENCE BOARD

SUBJECT: Long-Range Requirements for Satellite  
Photographic Collection

REFERENCE: USIB-D-41.13/10 (COMOR-D-13/14)

1. This report is in response to the assignment by the Board at its Executive Session, meeting of 22 July, and seeks to respond directly to the Chairman's directive to COMOR set forth as an attachment to the referenced document. For the convenience of the Board in studying this report, that attachment is set forth as Tab A.

2. In pursuing its assignment, COMOR took into account its knowledge of the nature and mode of operation of the present KH-4 and KH-7 systems and the results obtained therefrom, comments of the NRO on the prospects of improvements to these systems, a briefing by CIA on a proposal for a search system with area coverage approximating KH-4 and resolution approximating KH-7, and a briefing by the NRO on

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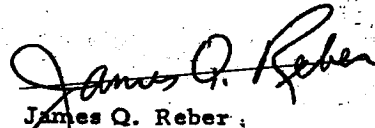
CORONA/GAMBIT/LANYARD

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G-3 and LANYARD. It had available, of course, the papers on the same subject submitted to the Board in April 1963 but on which there had not been a conclusion by the Board. NRO and the NPIC representatives participated fully in the discussions.

3. In direct response to the Board's assignment, the COMOR specified to NPIC the essential elements of information on major problems with a request that the NPIC, using the resources of all of the agencies participating in NPIC, advise on the extent to which the EEI could be met by photography with a capability of resolution to permit interpretation objects ten feet, three feet, [REDACTED]. The results of this study are submitted at Tab C.

4. The conclusions which COMOR has reached as a result of its examination of the problems presented in our assignment are expressed in Tab B.

  
James Q. Reber,  
Chairman

Committee on Overhead Reconnaissance

Attachments (3)  
Tab A  
Tab B  
Tab C

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Tab A

Directive to COMOR Regarding Long-Term Intelligence  
Requirements for Satellite Photographic Reconnaissance

1. COMOR is directed to provide for the Board's consideration at its 29 July meeting recommendations for future intelligence requirements for satellite photographic reconnaissance from the standpoint of required input to the intelligence inventory. In preparing its report, COMOR should take into account the experience achieved thus far through the use of the KH-7 and KH-4 configurations and an analysis by NPIC on the extent to which specified Essential Elements of Information can be met by improved resolution and quality of photography.

2. The COMOR deliberations and report should be concerned with the needs from an intelligence viewpoint of improved resolution in the GAMBIT spotting system, the advantages and disadvantages of a very much higher resolution in the spotting system even though the area coverage is reduced, the ability of the present and contemplated spotting systems to cover targets of interest with due consideration to accuracy of pointing and the ability to cover successive targets because of time involved in the roll and pointing of the camera.

3. Recommendations will be expected on the advantages of improvements to the present GAMBIT system considered feasible with further research and development and also advantages to be gained from further improvement in the existing CORONA system.

4. The importance of the development of a search system with area coverage approximating the CORONA (KH-4) but with resolution equaling the GAMBIT (KH-7) should be examined from the standpoint of the value of the input of Essential Elements of Information to the intelligence inventory resulting from such a development.

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Tab A Contd

5. Finally, consideration should be given to the need for an interim search system built around the LANYARD cameras which might produce resolution considerably better than the KH-4 but not as good as the KH-7 and which could be available long in advance of any of the proposed systems.

6. Although there is no indication that budget restrictions or technical or physical resources would necessarily foreclose concurrent action in several of the areas mentioned above, USIB would be interested in COMOR's views on the relative importance and hence the priorities which might be attached to the several courses of action indicated.

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Tab B

### CONCLUSIONS

1. Intelligence requirements for search and surveillance necessitate a satellite photographic capability or capabilities for complete area coverage of the Sino-Soviet Bloc with a resolution which will permit interpretation of objects between three and four feet on a side.
2. There is also a requirement for photography which will permit interpretation of details on the order of [REDACTED] on a side on a number of targets.
3. There are many advantages and we believe no disadvantages from the point of view of photo interpretation or analytic usefulness in a satellite photographic system which would have continuous stereoscopic ground coverage equivalent to KH-4 and resolution equivalent to KH-7.

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4. There would also be advantages in a system with the capability to permit interpretation of details [REDACTED] on a side even with a swath width approximately half that of KH-7. Such resolution would provide valuable increments to our intelligence inventory. Although the number of targets for which such a system would be required in terms of vital importance is relatively small, the ability of such a system to also provide additional information on less critical targets could be an over-all important bonus.

5. Improvements are perhaps possible in KH-4 and KH-7 resolution--at best a reduction in the KH-4 from ten to nine feet and in the KH-7 from three to two feet. Improvement should be made in these systems, as well as in their reliability, without impeding development of the systems discussed in paragraph 7.

6. Because of its relatively narrow swath width (about 50 miles) and non-contiguous stereo coverage, the LANYARD System

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(KH-6), of which there are five packages available, could not be usefully employed as a substitute for KH-4; nor, since it has an estimated five-foot on a side resolution, could it be employed as a substitute for KH-7. COMOR has concluded that the KH-7 should be used in lieu of the KH-4 as a crisis satellite. However, before submitting its recommendation to the Board, COMOR has requested comments from the NRO and the NIC. In view of the fact that we are advised that the five LANYARD packages can be reinstated and placed on standby as a crisis satellite without interference with the developments recommended in paragraph 7 below, we recommend the consideration of LANYARD for this purpose. In that case, there might eventually be on standby for a crisis both a KH-7 and a LANYARD, which in certain circumstances would be extremely desirable.

7. Recommendations on New Systems:

- a. That developmental work should proceed  
urgently toward the achievement of

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Tab B Contd

(1) A single capability for search  
and surveillance with a continuous stereo-  
scopic ground coverage equivalent to KH-4  
and a resolution equivalent to KH-7; and

(2) A capability which will permit  
interpretation of details on the order  
[REDACTED] on a side even with a swath  
width approximately half that of KH-7.

b. That, if a priority of development must be  
established, the second should have first priority. (COMOR  
believes that in view of the existence today of a search and  
surveillance capability in the form of KH-4 and KH-7, the  
most urgent need is to develop a collection capability to  
fill the coverage gap in the high-resolution area, [REDACTED]  
[REDACTED])

\*The CIA recommends that the first capability should have priority over  
the second. For the following reasons: a., A high-resolution system

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Tab B Contd

(three feet at nadir) which gives continuous, stereoptic coverage of a strip some 300 miles wide would appear to have substantially greater advantages from an over-all intelligence point of view over a very high resolution system [REDACTED] which CIA believes is seriously limited by the very narrow swath width and by the difficulty of achieving the necessary, extremely high pointing accuracy; and b., Based on CIA's analysis of several major weapons systems and nuclear materials installations, photographs with a ground resolution of about three feet are adequate to determine existence and identity, and to provide in most cases the data upon which capacity/capability can be estimated.

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Ground Resolution Comparison by NPIC  
(see attached)

1. The Board requested that COMOR's study take into account an analysis by NPIC on the extent to which the specified Essential Elements of Information (EEI) can be met by improved resolution and quality of photography. COMOR accordingly arranged for a CIA study on this question to be subjected to amplification of the EEIs by DIA and evaluation of target data at three different ground resolutions by joint teams of DIA and CIA photo interpreters. Within the limits of the time permitted, such amplification of the EEI was made and the above task force at NPIC sought to complete its evaluation. Pages 1 through 9 have been fully coordinated insofar as these evaluations are concerned. Pages 10 through 17 have not for lack of time been fully coordinated.

2. The Director, NPIC has given as his opinion that differences between the CIA study and the joint evaluation are probably not significant. He observes that for the most part, they are differences in precise interpretation or small variances in probability. This judgment was presumably based on pages 1 through 9.

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3. It was the consensus of COMOR that the column headed "Alternative, Possibly Better, Sources," should be omitted at this time. It was agreed that this column as presented is incomplete, particularly as to SIGINT contributions, and would nevertheless be thoroughly meaningful only if it contained alternative sources which could be weighed against a "yes" or "partially" in the [REDACTED] column. It would also only be important should the answers in the ten-foot column and three-foot column have been "no" or "partially." It would be necessary to specify that such obvious alternatives as obtaining the article in question, obtaining an operations manual, or suborning a technical expert involved in the design of the article must be ruled out. Furthermore, to permit a proper weighting of the need for such detailed photography, the entry in the "Alternative Source" column should be specific as to the type and value of the various elements of information which could be obtained on the one hand by high-resolution photography and on the other by the alternative source.

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TCS-7473-64

27 July 1964

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Legend

- Yes - Task can be accomplished
- Partially - Task partially accomplished
- ? - Some possibility task can be accomplished
- No - Task impossible
- \* - Elements of information added by WMAP-1

General Indication of Intelligence Information Obtainable Relative to Ground Resolution of Camera Systems

Information Sought	10'	3'	Alternative, possibly better sources	Remarks
<u>A. ICES-ERP/IRFM System</u>				
Identify launch complex	yes			
* Area search	yes			
* Identify launch & support facility	yes			
<u>Basing</u>				
Hard or soft launch	yes			
If soft - how missile prepared and ejected for launch	?	?		If gross features are to be considered dependant upon amount of detail requested
If hard - determination of hardness based on:				
- Thickness of silo door				partially
- Thickness of walls				partially
- Extent "rattle space"				partially

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COMINT CONTROL SYSTEMS JOINTLY

HABLEE VIA TARGET-KEYHOLE-  
CONTROL CONTROL SYSTEMS JOINTLY 2

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Information sought	10'	3'	Alternative, possibly better sources	Remarks
- Suspension system				
Type launch (fly out or lift out)	partially	partially		Depends on timing and angle of photography
*Periodic phases of site construction	partially	yes		General stages of construction (early, mid, late) identifiable on 10'
* Identification of ambiguous support facilities (i.e., missile/spacing)	partially	?		Complete answer requires other information
* Identification of weapons system employed	partially	partially		
* Refire capability- Quantity of support facilities and additional missile storage on or near launch sites	?	?		
Location of nuclear warhead storage	partially	yes		

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FCR-1473-64

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Alternative possibly  
better sources



10' 3'

Information sought

Technical Characteristics of Missile

liquid or solid fuel  
partially partially partially  
If liquid, types of propellant  
no ?

Number of engines ?

Guidance, whether all-inertial  
or radio-inertial  
partially partially partially

If radio-inertial, how functions ?

Dimensions of missile:

- Length partially yes

Diameter at base partially

Number of stages partially

- Sizing of nose cone (RV) ?

If defined on  
missile "

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WGS-7173-64

HARDCOPE VTA TARGET-KRYHOLM-  
CONTROL SYSTEMS JOINTLY

Information Sought

10' 3'

Alternative, possibly  
better sources

Remarks

B. AEW/SAM Systems

Locate/identify ABM facility/  
complex and security measures

yes

If signature is  
known  
Security measures  
provide problems  
at 10'

Report areas & facilities & equip-  
ment ABM & SAM

yes

Equipmt. may not be  
seen at 10'

Electronics

- Frequency of radar

no

?

- Dimensions of associated  
radars and other sensors

?

partially yes

- Dimensions of wave guide

no

?

- Interrelationships between  
element facilities of ABM  
complex testing areas  
and oprnl. sites

partially

yes

- Power input to major radars

partially

partially

Depends on size of  
radar associated  
with system

Externally supplied  
power to site only

Weapons

- Launcher mechanism/mode of  
launch

no

partially

yes

Characteristics AEW/SAM

- Distinguishing

?

partially

yes

Mode of launch par-  
tially at 10'

Partially



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TUC-7473-64

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Information Sought: 10' 3' Alternative, possibly better sources Remarks

Characteristics ABEI (continued)

Characteristics	10'	3'	Alternative, possibly better sources	Remarks
* Fuel type guidance	?	?		
* Missile Ranges (facilities)	no	partially	partially	
* Layout and Transportation	yes	yes	yes	
* Support Buildings	yes	yes	yes	
* Pad Configuration	yes	yes	yes	
* Missile Configuration	no	partially	yes	This will not permit detailed SAT analysis
* Launch Systems	partially	yes	yes	
* Type Guidance	no	no	?	
* Electronics Instrumentation Layout	yes	yes	yes	
* Electronic Instrumentation Components	no	no	partially	Uncertain meaning

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