

CORONA

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on NOV 26 1997

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24 October 1968

MEMORANDUM FOR: Director of Special Projects

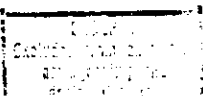
SUBJECT : Comparison of CORONA Performance
Evaluation Reports

1. A comparison of various system performance evaluations of CORONA indicates that the Preliminary Assessment prepared by representatives of the DDI and the DDS&T is usually quite different from other evaluations. The reports compared were

- a. The Preliminary Assessment,
- b. The [REDACTED] TWX prepared by the NPIC breakdown team,
- c. Performance Evaluation Interim Report (TWX) prepared by the PET,
- d. Performance Evaluation Report prepared by NPIC.

Attached are excerpts from the Preliminary Assessments of CORONA missions 1040 through 1047 and 1101 through 1104, along with excerpts from other evaluations listed above.

2. The purpose of these reports follows:
- a. The Preliminary Assessment is an early report of intelligence items to the community.
 - b. The [REDACTED] TWX is to provide NPIC and AP with the basic information required to evaluate quality of film and level of success achieved.
 - c. The Performance Evaluation Interim Report is to provide an engineering assessment for the Contractor to use in preparation for the succeeding launch.
 - d. The Performance Evaluation Report is an overall mission report containing launch, on-orbit and recovery data, camera operation, film, image quality, and density reading, etc.



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SUBJECT: Comparison of CORONA Performance
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3. A quick review of the attachments will reveal that the Preliminary Assessments are usually quite negative in their first paragraph, which is related to mission performance. In particular, a mission percentage of cloud-free photography is usually given and is usually 25% to 30% below the cloud-free percentage published by NPIC in the [REDACTED] TWX. One could assume that the percentage given in the Preliminary Assessment is related to particular targets; however, it is written as a total mission figure. Also, phrases such as "only a few significant developments," "small scale photog-raphy," "low resolution photography," "no unusually significant information," etc., are usually noted in the first paragraph of the Preliminary Assessment. This is then followed by several paragraphs that list intelligence finds and are, for the most part, objective, with the exception that numerous references to conditions of photography plus liberal use of the word "only" are apparently used as an escape route in the case that the photointerpretation turns out to be inaccurate.

4. The undersigned has noted that within OSP, the SA/IS/OSP has interpreted the first paragraph to describe the total mission and, in many instances, points out this information by underlining the negative comments and routing the Assessment to the appropriate offices, such as D&AD, PD/H/OSP and SO/C/OSP for information. Since this procedure occurs within OSP, it is assumed that the same sort of response occurs in other components of the Agency, perhaps even more readily in offices such as OSI and FMSAC where analysts are concerned with particular targets.

5. It is felt that negative comments such as those described above cannot contribute to the value of collected intelligence and that these comments are a particular hindrance to a collection effort such as CORONA and other systems under your direction.

6. I, therefore, suggest that you may wish to contact the DDS&T and the DDI and have the first paragraph deleted from future Preliminary Assessments, thus leaving only objective intelligence information.

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SO/C/OSP

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SUBJECT: Comparison of CORONA Performance
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Distribution:

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[REDACTED] TALENT KEYHOLE [REDACTED]

CONTROL SYSTEMS 10/1/54

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MISSION 1040-1

30 March - 4 April 1967

PRELIMINARY ASSESSMENT [REDACTED]

11 April 1967

"1. ...The mission produced little new intelligence. However, several important targets missed by the first part were programmed for coverage by part two.

"2. Six of the 25 ICBM complexes were at least partially covered on this mission. So far, only one new small single silo has been identified. No evidence of missile deployment was seen at the suspect ICBM area near Zalari which was covered by fair quality photography."

COMMENT: Does "at least partially covered" mean that some of the six were totally covered or all of the six were partially covered? Why did they say only one new silo?

"3. The surface-to-surface missile portion of Kapustin Yar was covered by clear photography on 3 April. Missile support equipment was noted at pads in three launch complexes. The unidentified vehicle fired from Kapustin Yar to 1050 nm on 4 April and the three SS-4 firings last week probably were associated with activity noted in Complex C. A rail-served erector which was removed in February from a pad associated with the Cosmos program is still missing. This site may now be used for launches of the KY-8 missile."

COMMENT: What does "clear photography" tell us? Was it good, fair or poor? Note in the previous paragraph they stated fair quality photography. Not consistent.

"4. At Sary Shagan, a new antenna is being built on the site of one of the dismantled Hen Roost radars. Construction was observed at the other Hen Roost site on a mission late last year. Galosh missile canisters are observed at several launch positions at Launch Complex B."

COMMENT: Was this new antenna identified for the first time on this mission?

"5. Portions of the Chinese missile test range at Suang-cheng-tzu, including Complexes A and B, were covered by fair-quality photography. Small pieces of equipment at one of the

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MISSION 1040-1 (Continued)

pads in the A complex and in the checkout area indicate a resumption of test activity in this complex. It has been inactive since at least January 1967. No significant changes were apparent at Complex B, and the large gantry at this site was back on the parking apron."

COMMENT: Note that again fair quality photography is mentioned.

"6. Cloud cover prevented a complete search of an area in Somalia where a Soviet tracking facility reportedly is under construction. The only thing which could be seen through the clouds was a short segment of a newly constructed road."



COMMENT: Why say "the only thing which could be seen"? Why not say, "However, a short segment of a newly constructed road was observed"?

"7. Some of the atomic energy facilities in the USSR, including Semipalatinsk and Novaya Zemlya, were covered, but no significant changes were observed."


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MISSION 1040-2

4 - 8 April 1967

PRELIMINARY ASSESSMENT

[REDACTED] 14 April 1967

"1. Mission 1040-2 is the second half of the KH-4 operation. Several significant items have come out of the mission so far in the readout."

"3. The Tyuratam missile test center was covered by fair-quality photography on 6 and 7 April. The gantry was in the G-3 pad on both days, indicating that Cosmos 154--launched on 8 April--came from this pad. The 8 April operation was the second in 28 days using the recently modified SL-9 launch system. The earlier launch was also from the G-3 pad."

"6. Twelve of the 25 ICBM complexes were at least partially covered by this mission. So far, six new small single silos have been identified in existing groups. The total number of small silos is now about 460; the count of large silos remains at 176.

"7. Four of the ABM complexes around Moscow and eleven of the 28 probable long range SAM complexes were covered, some only by poor quality photography. No significant changes were noted in any of the facilities."

COMMENT: The remainder of the report was objective and will not be quoted here.

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[REDACTED] HANDLE VIA [REDACTED]
TALENT KEYHOLE [REDACTED]
CONTROL SYSTEMS JOINTLY

MISSION 1040

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY Msg. No. [REDACTED] 24 April 1967

"The overall image quality of Mission 1040-1 and -2 is better than Mission 1038 and comparable to Mission 1039.... Analysis of the index camera photography showed generally clearer weather conditions for Mission 1040 than existed for 1038 and 1039."

[REDACTED] TWX Mission 1040-1

"Comparable to 1039....MIP 85."

[REDACTED] TWX Mission 1040-2

"Comparable to Mission 1040-1. MIP 85."

NPIC Photographic Evaluation Report [REDACTED] May 1967

"The best image quality on this mission is comparable to the best obtained by recent missions; however, the overall quality is affected by an intermittent band of image smearing in the flight direction on both panoramic camera records."

A summary of PI Quality Ratings was given as follows:

Good	9.2%
Fair	44.7%
Poor	46.1%

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[REDACTED] HANDLE VIA
[REDACTED] TALENT KEYHOLE [REDACTED]

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MISSION 1041-1

9 - 16 May 1967

PRELIMINARY ASSESSMENT [REDACTED]

23 May 1967

"1. The initial scan of Mission 1041-1, the first half of a two-package KH-4 operation, revealed only a few significant developments. Clouds hid a number of key targets, including the Chinese nuclear test site at Lop Nor, and the scale of the photography was below average due to a higher-than-normal orbit."

COMMENT: This report contains fourteen paragraphs of specific items of intelligence value. Most of these appear to be objective with the exception of two times where the work "only" is used in reporting finds. Therefore, these fourteen paragraphs will not be quoted.

MISSION 1041-2

16 - 24 May 1967

PRELIMINARY ASSESSMENT [REDACTED]

31 May 1967

"1. Mission 1041-2 was the second half of a KH-4 operation. As with the first half, a higher-than-normal orbit resulted in relatively small-scale photography. The initial scan of some areas will not be completed until later this week."

COMMENT: The eight paragraphs that follow the above list items obtained from this mission. From the "small-scale photography," such items were identified as aircraft, tent-like structures, radar reflectors, bunkers, six new silos, another long range SAM complex in an early stage of construction and submarines.

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HANDLE VIA [REDACTED]

TALENT KEYHOLE [REDACTED]

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MISSION 1041

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY

Msg. No [REDACTED]

8 June 1967

"The overall image quality of Mission 1041 is good and is considered to be comparable to that of Mission 1040. The photo interpretation suitability is degraded for targets at the most northern latitudes because of small scale resulting from the highly eccentric orbit. Some further degradation results from the small area of out-of-focus imagery of the slave camera....

"Heavy cloud cover and other atmospheric attenuation in some target areas further limited the value of this mission for current intelligence. However, the photo-interpreters judged the value of this mission as fair to good.

"While photo interpreters have expressed a slight preference for the higher contrast imagery produced by the forward camera, the team believes the information content of the aft camera imagery is equivalent, and in some cases, better."

[REDACTED] TWX

Mission 1041-1

"Good. Comparable to Mission 1040. Finer detail can be observed in the imagery of the forward looking camera record than that of the aft looking camera record. MIP 85."

[REDACTED] TWX

Mission 1041-2

"Good. Comparable to Mission 1041-1. The imagery of the forward looking camera record is slightly better than the aft looking camera. MIP 85."

NPIC Photographic Evaluation Report [REDACTED] August 1967

"The image quality of both panoramic camera records is good. However, finer detail can be observed in the imagery of the forward-looking camera record."

A summary of PI Quality Ratings was given as follows:

Good	7.1%
Fair	42.1%
Poor	50.8%

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MISSION 1042-1

17 - 22 June 1967

PRELIMINARY ASSESSMENT [REDACTED]

29 June 1967

"1. Mission 1042-1, the first of a two-part KH-4 operation, provided low resolution photography of prime intelligence targets in the USSR, China, and the Middle East."

"3. Photography of Egypt, Israel, Jordan and Syria--Iraq was not covered--on 17-20 June provides further evidence of the extensive damage inflicted upon Arab air forces by the Israeli air attacks on 5 June. In this photography we can count 200 Egyptian, 18 Syrian, and 26 Jordanian aircraft destroyed on the ground. In addition, a large POL storage facility about 10 miles south of Abu Rudeis Airfield on the Sinai shore of the Gulf of Suez is seen burning on 18 June. The cause of the fire is not apparent, but there is no evidence of bombing or shelling. The facility may have been set afire by Egyptians before they abandoned it to the Israelis."

COMMENT: Based on this paragraph, one wonders how to define low resolution when several hundred aircraft were counted and fires were identified. What kind of resolution is necessary for search and surveillance intelligence?

"4. This mission provides the most complete photography in the past year of the naval bases in the Soviet Northern Fleet. A total of nearly 100 submarines are identified at 13 bases. This accounts for well over half of the 160 submarines assigned to the Northern Fleet. About a dozen units are currently on patrol.

"5. Six H-class ballistic missile submarines are identified in the Northern Fleet. Some of these identifications are tenuous. If all are confirmed, however, the total number of this class assigned to the Northern Fleet is one higher than previously estimated.

"6. The new class ballistic missile submarine at Shipyard 402 has returned to its original berthing space from the middle of the estuary at Severodvinsk. The unidentified 428-foot submarine with a very large sail remains in the launching basin at the shipyard. It is still uncertain whether or not this submarine is the second unit of the new ballistic missile class, but [REDACTED]

[REDACTED]
the unidentified submarine.

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MISSION 1042-1 (Continued)



"7. An amphibious exercise was photographed in progress in the Northern Fleet on 21 June. Three W-class submarines, two Polnocny-class landing craft, and one of the new Alligator-class landing craft are identified. The submarines were probably providing offshore defense for the landing force. This is the first evidence that an Alligator-class is assigned to the Northern Fleet. The only other operational units of this class are two now deployed to the Mediterranean."

COMMENT: Once again, based on the four paragraphs quoted above, that's a fair number of identifications and counts for "low resolution photography." The remaining eight paragraphs of this report are objective statements relaying intelligence finds.


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MISSION 1042-2

22 June - 1 July 1967

PRELIMINARY ASSESSMENT [REDACTED]

11 July 1967

"Mission 1042-2 was the second half of a KH-4 search operation. It operated for ten days which, together with the 5-day flight of 1042-1, made this the longest two-part KH-4 mission to date. Mission 1042-2 photographed priority intelligence targets in the USSR, China, the Middle East, and the southern Pacific Ocean. The preliminary readout produced no significant information on these targets, many of which were cloud covered."

COMMENT: Note the "no significant information."

"1. Approximately half of the 25 Soviet deployed ICBM complexes were photographed by Mission 1042-2. Although clouds prevented a comprehensive look at many of the complexes, four new small single silos were discovered at previously identified groups. No new large-silo sites were found on this mission. The number of single silos operational or under construction now stands at 178 large and about 510 small silos."

COMMENT: Four new silos is not "significant information"?

"4. All of the Suangchengtzu missile test center was observed on 28 June in clear stereo photography, but no operational activity was evident. Coverage of the Lop Nor nuclear test site on 23 June showed some 240 tents in the vicinity of the Main Control Point, the Air field, and the support area. There were no indications of preparations for a new test."

"6. The French Pacific nuclear test site was covered on 28 June. What appears to be surface changes in the vicinity of Dindon, on the western end of the Muruoa Atoll, could have resulted from the French nuclear detonation on 22 June--probably a balloon-borne test. Earlier coverage on [REDACTED] had indicated that this test would occur at Dindon."

"7. This mission photographed Israel and large sections of Egypt, Syria and Jordan. Complete coverage was obtained of Egypt's 35 SAM sites and SAM support and training areas. Missile production and test facilities at Ramle and Qiryat Yam in Israel and at Jabal Hmazi and Heliopolis in Egypt were also observed, but no important changes were discerned. An Alligator-class landing craft may have been in the roadstead of Latakia,

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MISSION 1042-2 (Continued)

Syria, when the port was photographed on 27 June. Previous information had indicated that a Soviet Alligator made a port call at Latakia about this time."


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MISSION 1042

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY [REDACTED]

13 July 1967

"Mission 1042 is considered to be one of the better flights. Fewer than usual anomalies were experienced and good image quality was obtained. Unusually crisp appearance of the photography in cloud free areas resulted from generally low haze conditions. The photo interpretability of Mission 1042 is judged to be generally good. The interpreters made particular mention of favorable atmospheric conditions prevailing over many of the target areas."

[REDACTED] TWX

Mission 1042-1

"The image quality of the fwd-looking camera record is good and slightly better than that obtained from the aft camera. MIP 85. A small area of out of focus imagery is present...."

[REDACTED] TWX

Mission 1042-2

"The image quality of the fwd looking camera is good and slightly better than that obtained by the aft camera. The out of focus area reported for Mission 1042-1 could not be found on Mission 1042-2. MIP 85."

NPIC Photographic Evaluation Report [REDACTED] October 1967

"The overall image quality of the main cameras is considered to be good. An MIP rating of 85 is assigned."

A summary of PI Quality Ratings was given as follows:

Good	11%
Fair	62%
Poor	27%

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[REDACTED] HANDLE VIA
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CONTROL SYSTEMS [REDACTED]

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MISSION 1043-1

8 - 14 August 1967

PRELIMINARY ASSESSMENT [REDACTED]

22 August 1967

"1. ...Mission 1043-1 photographed priority intelligence targets in the USSR, China and the Middle East. Cloud cover was relatively heavy and, except for Soviet ICBM installations and the Chinese advanced weapons facilities, little significant information was obtained."

COMMENT: Eight paragraphs of intelligence items in this report are objective and will not be quoted. The weather hampered readout of many of the priority 1 targets on this mission and that fact was repeated in nearly every paragraph.

MISSION 1043-2

14 - 22 August 1967

PRELIMINARY ASSESSMENT [REDACTED]

2 September 1967

"1. ...Significant information was obtained on possible Soviet preparation for a test at the Semipalatinsk Test Center, the Soviet missile submarine program, and the Sary Shagan missile test center. Poor photographic conditions--heavy cloud cover, haze and, in many instances, partial coverage of some targets--hampered interpretation efforts."

COMMENT: Several items objectively reported here with one note of interest that the continuing appearance of Galosh missiles at Sary Shagan indicates that the system testing is continuing. Satellite photography is the only evidence available.

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MISSION 1043

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY Msg. No. [REDACTED] 2 September 1967

"The image quality of Mission 1043 up to the occurrence of system malfunctions was good and comparable to recent CORONA missions. The aft camera performed satisfactorily throughout the mission and the image quality of the aft material was good and consistent throughout....The photo-interpretability of Mission 1043 ranges from good to poor. The quality of most imagery generated during the first half of the mission (Mission 1043-1) is considered to be good when atmospheric conditions are favorable. There was, however, a prevalence of adverse atmospheric conditions. Additional degradation attributed to blowing sand is apparent in certain heavily targeted areas of 1043-1. The PI suitability of Mission 1043-2 is poorer than that of Mission 1043-1."

[REDACTED] TWX

Mission 1043-1

"The image quality of the forward looking camera record is good and comparable to Mission 1042.

"The image quality of the aft looking camera record is good and slightly better than that of the fwd camera record. MIP 85."

[REDACTED] TWX

Mission 1043-2

"The image quality of the forward-looking camera is good and comparable to 1043-1. The image quality of the aft looking camera is good and slightly better than that obtained from the forward-looking camera. MIP 85."

NPIC Photographic Evaluation Report [REDACTED] December 1967

"An MIP of 85 is assigned to this mission....Approximately 65 percent of the mission contains cloud-free photography....

"There was an orbit adjust on rev 2....As a result,...the panoramic cameras operated at the slowest cycle rate. This slow cycle rate caused poor imagery and lapse in ground coverage."

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MISSION 1043 (Continued)

A summary of PI Quality Ratings was given as follows:

Good	6.6%
Fair	55.0%
Poor	38.4%


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MISSION 1044

3 - 11 November 1967

PRELIMINARY ASSESSMENT

17 November 1967

"Mission 1044, a two-part low resolution KH-4 operation, provided new intelligence on Soviet ICBM deployment, preparations for Soviet and Communist Chinese nuclear tests, and deployment of surface-to-air missiles in the USSR and East Germany. Missile test centers in the Soviet Union and China were photographed but no significant operational activity was noted.

"Of special significance was the identification for the first time of two dummy launch sites at a deployed Soviet ICBM complex. The extensive use of such deception could pose serious problems in estimating and targeting Soviet ICBM strength."

COMMENT: Note the "low resolution."

"1. Clear photography of the SS-9 ICBM complex at Kartaly revealed two dummy single silo launch sites, the first ever identified....Poorly constructed access roads and the absence of ground scarring and construction support facilities at the sites provide further indications of fakery. Without the negation coverage last June, it is doubtful that these two sites could be firmly identified as dummies on the basis of KH-4 photography.

"2. In addition to the dummy sites at Kartaly, two real sites were newly identified there, filling out a group of SS-9 silos. One new SS-9 silo was discovered at Imeni Gastello, completing a group there. Twelve new small single silos for the SS-11 were seen at other complexes; ten of these are in two new groups at Kozelsk. The single silo count now stands at 186 large and 555 small silos.

"3. Photography of Semipalatinsk provided further indications of the preparation of a probable new underground test area designated Degelen West....

"4. At the Shagan River facility, another test area at Semipalatinsk, a probable rig, control bunker, and two instrumentation sites are located north of the crater caused by the 15 January 1965 underground nuclear test, the only one detected at this site...."

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MISSION 1044 (Continued)

"6. This mission confirmed recent evidence from intercepted communications that elements of a motorized rifle division had moved from Feodosiya on the Black Sea to Nizhniy Vdinsk, some 150 miles north of the Mongolian border. Approximately 400 vehicles and pieces of equipment were seen parked at Nizhniy Vdinsk. This equipment was evidently rail transported to Nizhniy Vdinsk since May when the area was last photographed."

COMMENT: "400 vehicles and pieces of equipment" from "low resolution" photography?

"7. Two new Tallinn (SA-5) complexes are under construction...."


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MISSION 1044

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY Msg. No. [REDACTED] 1 December 1967

"A minimum of payload system anomalies occurred during this mission thus providing one of the most trouble-free flights to date. The image sharpness attained is equal to any previous CORONA J-1 photography, permitting most imagery to be viewed at (60X) magnification. The dual gamma [REDACTED] processing used on several parts of this mission produced excellent photography. The PI's reported that the quality of the mission is generally good where not degraded by atmospheric attenuation; however, there is a predominance of cloud cover over the highest priority targets."

[REDACTED] TWX

Mission 1044-1

"Image quality...is good....Minor bands of smearing are present....MIP 85."

[REDACTED] TWX

Mission 1044-2

"The image quality of the fwd looking camera is good and comparable to the aft camera. The minor bands of image smearing are still present on this mission.

"The image quality of the aft looking camera is good; however, the quality appears to be slightly less than on Mission 1044-1. MIP 85."

NPIC Photographic Evaluation Report [REDACTED] February 1968

"The image quality of the main cameras is considered to be fair to good. An MIP of 85 was assigned to both segments of the mission. Over-all cloud cover is estimated to be 35 percent."

A summary of PI Quality Ratings was given as follows:

Good	21.4%
Fair	50.8%
Poor	27.8%

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MISSION 1045-1

24 - 31 January 1968

PRELIMINARY ASSESSMENT

[REDACTED] 7 February 1968

"1. KH-4A Mission 1045-1 of 25-31 January 1968 photographed portions of the USSR, China, North Korea, North Vietnam, South Vietnam, and the Middle East. About 70-80 percent of the photographed areas were cloud-free, but the small scale and fair-to-good image quality of the photography limited intelligence exploitation. No unusually significant information was obtained from any of the areas covered."

COMMENT: I thought fair-to-good image quality was considered quite acceptable.

"2. Icebreaker Lenin: The icebreaker Lenin, the Soviets' only nuclear-powered surface ship, was seen at the Yagry Island Nuclear Support Facility at the Severodvinsk Shipyard. The ship may be at the yard for major overhaul. The Soviets had power plant problems and other difficulties with the Lenin. The ship has been idle for the past two seasons. In early September, the icebreaker was observed under tow off the Kola Peninsula and was last seen at the Rosta Ship Repair Yard in Kola inlet in early October.

"3. ICBM Complexes: All or portions of eleven of the 25 ICBM complexes were covered by interpretable photography on this mission. Only one new ICBM site--an SS-11 silo at the Svobodnyy Complex--was identified during the preliminary read-out. While failure to find more than one new site at the four SS-11 and one SS-9 complexes is significant, it does not provide an indicator of the status of deployment programs because complexes that are regarded as more likely candidates for construction of additional sites were not seen. The number of identified sites remains 193 for the SS-9 and is about 566 for the SS-11."

"4. Tyuratam: The entire Tyuratam Missile Test Center was seen in fair quality, snow-covered photography. The probable facilities checkout vehicle seen on Pad J-1 in December 1967 has been moved back into the massive building and the transporter-erector is located on the rail outside. The first test flight from Complex J of a vehicle--expected to eventually put Soviet cosmonauts on the moon--is still not expected before the last half of 1968.

"5. A fourth single silo under construction was detected at Tyuratam's Launch Group O--first identified last December. These silos are suspected of being new and perhaps harder silos for SS-9 ICBMs."

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MISSION 1045-2

31 January - 7 February 1968

PRELIMINARY ASSESSMENT

[REDACTED] 15 February 1968

"1. KH-4A Mission 1045-2 of 31 January-7 February 1968 photographed portions of the USSR, China, North Korea, North Vietnam, and the Middle East. The photographed areas of South China and North Vietnam, however, were about 95 percent cloud covered."

"8. Air Defense: The Sary Shagan Antimissile Test Center was almost completely covered by clear photography, but snow cover and only fair interpretability limited its usefulness. No new missile facilities were observed."

COMMENT: Note the evaluation given in NPIC Photographic Evaluation Report for Mission 1045 which states that this photography was equal to the best ever produced by a J-1 System.

"12. Unidentified installations: All of the five suspect advanced weapons related facilities in China were covered by fair-to-poor photography. Nothing of significance was noted."

"14. USS Pueblo: The USS Pueblo was no longer anchored at its previously reported location in the Changchigon Bay, 2.5 miles east-northeast of Munchon Naval Base. The cloud-free but small-scale photography does not allow a conclusive identification of the USS Pueblo in the Wonsan area. The initial identification of a possible vessel at Nunchon Naval Base equating to the USS Pueblo in this photography cannot be confirmed."

"16. Airfields: All of the major airfields in North Korea except Sinmusong (Samjiyong) were covered and the observed air order of battle indicates that there have been no major redeployments of North Korean jet aircraft. Pyongni airfield, which has been under reconstruction and modernization since June 1966, had ten small possible aircraft, indicating it is probably returning to operational status.

"17. Ground and Naval Activity: Ground forces activity and naval inventory by type are precluded by the small scale of the photography. However, all naval bases except the submarine base at Shaho-Nodongjagu were covered and no unusual activities were observed."

[REDACTED] Page Twenty-two

CORONA

~~TOP SECRET EYES ONLY~~

[REDACTED] HANDLE VIA
TALENT KEYHOLE [REDACTED]

CORONA

~~TOP SECRET BUREAU~~

MISSION 1045

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY Msg. No. [REDACTED] 29 February 1968

"This mission provided a near trouble free performance of the CORONA camera series. The photointerpreters and the PET consider the best quality photography of Mission 1045 to be comparable to the best ever attained by the J-1 camera system. However, as usual, the overall quality is variable in association with atmospheric attenuation and solar position."

An MIP of 90 was assigned to this mission.

[REDACTED] TWX

Mission 1045-1

"The image quality of the fwd-looking camera is good and comparable to the aft camera.

"The image quality of the aft-looking camera is equal to or slightly better than the best photography obtained from the J-1 system. MIP 90. The quality is also slightly better than the fwd-looking camera."

[REDACTED] TWX

Mission 1045-2

"The image quality of the forward-looking camera is good and comparable to quality of the forward camera material of 1045-1. The image quality of the aft-looking camera is comparable to Mission 1045-1. MIP 90."

NPIC Photographic Evaluation Report [REDACTED] September 1968

"The image quality of the aft-looking camera is comparable to the best obtained by this camera system. The improved image quality is believed to be the result of a more correct focus setting prior to launch and a more favorable focus shift during flight. An MIP of 90 is assigned to the mission.

"Approximately 20 percent of the mission is obscured by clouds."

CORONA

~~TOP SECRET BUREAU~~

[REDACTED] Page Twenty-three

[REDACTED] HANDLE VIA [REDACTED]
[REDACTED] [REDACTED]

CORONA

~~TOP SECRET BUREAU FILE~~

MISSION 1046

14 - 30 March 1968

PRELIMINARY ASSESSMENT

[REDACTED] 9 April 1968

"1. KH-4 Mission 1046 obtained fair quality photography of much of the USSR, China, North Korea, North Vietnam and French space and nuclear test facilities in French Guiana and the South Pacific. Snow cover hindered photographic interpretation in the USSR and Northern China, and much of Southern China was cloud covered. Over half of the photographed areas of North Korea and North Vietnam were cloud covered and no significant intelligence was obtained on either country."

"3. All Moscow-area ABM triad launch complexes were covered on cloud-free photography by this mission. Single Galosh missile canisters were indicated on launchers at each of the three completed triads. While construction activity continues on the more advanced incomplete triads, there has been little or no evidence of progress since Fall 1967 on the two triads most recently started. No second triads have been begun at either of these sites. In addition, no construction paralleling that indicated at triad E-21 by a mid-March [REDACTED] is underway at any of the other Moscow triads. The [REDACTED] showed three buildings and a long, low structure not previously associated with ABM deployment under construction at E-21."

"6. Coverage of all or portions of 16 of the 25 Soviet ICBM complexes on this mission still does not permit a confident assessment of the status of the SS-9 and SS-11 deployment programs. Eight of the ten SS-11 complexes were covered, but complexes such as Teykovo, Perm, and Yedrovo, which are believed to have the greatest potential for additional groups, were either not covered or not interpretable. Only four new SS-11 silos, all in existing groups, were discovered on this mission. The total number of identified SS-11 silos is now about 575. Three new silos for the SS-9 missile filled out all identified groups and bring the total number of SS-9 silos to 198. One additional silo of a new type probably intended for the solid propellant ICBM was identified at the Yashkar-Ola complex, bringing the total number of such silos there to 17."

COMMENT: Why "only" four new silos?

"8. The mission photographed the Tyuratam, Plesetsk, and Kapustin Yar/Vladimirovka Missile Test Centers, and the Sary

[REDACTED] Page Twenty-four

CORONA

~~TOP SECRET BUREAU FILE~~

HANDLE VIA
TALENT KETCHER

[REDACTED] CONTROL SYSTEMS

CORONA

~~TOP SECRET DUE TRINE~~

MISSION 1046 (Continued)

Shagan Antimissile Test Center. The quality of the coverage of Kapustin Yar/Vladimirovka and Sary Shagan was poor. No significant developments were detected at any of these test centers."



"10. Poor quality photography of Wu-sha-ta-la Airfield on 26 March shows a possible TU-16 Badger bomber there. In the past, Badgers at this airfield have been one of the indicators of nuclear tests at Lop Nor. The identification of the Badger is only tenuous, however, and there are no other indications at present of preparations for a Chinese nuclear test."

"12. Photography of the space center in French Guiana shows three launch complexes, a probable instrumentation area, an interferometer, and two probable tracking sites under construction. The first French satellite launching from this center is scheduled for 1969."


Page Twenty-five

CORONA

~~TOP SECRET DUE TRINE~~

 HANDLE VIA
ALENT-KEYHOLE 

CORONA

~~TOP SECRET DATA SOURCE~~

MISSION 1046

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY

Msg. No. [REDACTED]

2 May 1968

"The PET judged the quality of Mission 1046-1 as good, and comparable to the better J-1 missions. Portions of 1046-1 were comparable to the best photography ever produced by a J-1 camera. The photointerpreters rated 1046-1 as fair to good and 1046-2 as fair to poor. There was a progressively worsening anomaly on the entire mission that produced varying image quality across the web. On 1046-2 this quality varied from generally good on the outboard side to generally poor on the inboard sideWeather conditions were generally favorable, with a high percentage of cloud and haze free acquisitions. The incidence of smear as reported...was not verified by the PET. The poor imagery caused by the anomaly was out of focus and not smeared."

[REDACTED] TWX

Mission 1046-1

"The image quality of the fwd-looking camera is good and comparable to the aft camera.

"The image quality of the aft-looking camera is good and comparable to Mission 1045. MIP 90."

[REDACTED] TWX

Mission 1046-2

"The image quality of the forward camera is good. The quality, however, is not as good as that of the first bucket. There appears to be slight image smear on many frames. The image quality is comparable to that of Mission 1044. MIP 85.

"The image quality of the aft looking camera is comparable to that of the fwd looking camera."

NPIC Photographic Evaluation Report [REDACTED] August 1968

"The overall image quality is considered to be good on Mission 1046-1 and fair on Mission 1046-2. The aft camera imagery is considered to be of better quality than that obtained by the forward camera. An MIP of 90 was assigned to part one and an 85 to part two."

[REDACTED] Page twenty-six

CORONA

~~TOP SECRET DATA SOURCE~~

[REDACTED] [REDACTED] [REDACTED]

CORONA

~~TOP SECRET RUST ZONE~~

MISSION 1046 (Continued)



A summary of PI Quality Ratings was given as follows:

Good	7.6%
Fair	40.6%
Poor	51.8%


Page Twenty-seven

CORONA

~~TOP SECRET RUST ZONE~~

 HANDLE VIA
TALENT KEYHO 

CORONA

~~TOP SECRET BUREAU CODE~~

MISSION 1047

19 June - 5 July 1968

PRELIMINARY ASSESSMENT

[REDACTED] 16 July 1968

"1. ...This mission covered some targets of high interest in the USSR and China, but cloud cover was extensive and generally the intelligence gained from this mission was sparse.

"2. Soviet ICBM deployment is continuing. Four new groups of SS-9 silos were detected, as were a number of new SS-11 silos. One new silo for the solid propellant was also observed in an existing group. Soviet naval construction programs are continuing about as expected. No significant new developments were noted in the Moscow ABM system. Coverage of the missile test centers was poor or lacking. Coverage of China produced no significant new intelligence.

"3. Twenty of the 25 Soviet ICBM complexes were covered although some of them only partially. A new group of silos for the SS-9 ICBM was discovered at each of four complexes at Aleysk, Dombarovskiy, Imeni Gastello, and Kartaly. The 15 newly discovered silos--12 in the new groups and three in previously identified groups--brings the total number of SS-9 launchers under construction and operational to 214 in 38 groups.

"4. Eighteen new silos for the SS-11 were also detected, all of them located in known groups. The number of identified SS-11 launchers now stands at about 615 in 64 groups.

"5. One new silo believed to be for the small solid propellant SS-13 (formerly designated the KY-6) was detected at the Yoshkar-Ola ICBM complex, bringing the total of this type to 19."

"8. Five new SA-5 complexes were identified. There are now a total of 58 SA-5 complexes of which 15 to 20 are probably now operational. By 1973 there probably will be between 100 and 125 operational SA-5 complexes with over 1,850 missiles.

"9. Four "Y" Class SSBN were observed in the Severodvinsk shipyard on both 3 and 4 July 1968. This is the first time that as many as four "Y" Class have been observed in Keyhole photography at any one time. Two of the four units were observed in the main launch basin and are believed to be the same units observed in identical positions on 13 June 1968 (KH [REDACTED]). The other two "Y" Class units were positioned along the main quay.

[REDACTED] Page Twenty-eight

CORONA

~~TOP SECRET BUREAU CODE~~

[REDACTED] HANDLE VIA
[REDACTED] TALENT KEYHOLE [REDACTED]

CORONA

~~TOP SECRET DUE TIME~~

MISSION 1047 (Continued)

"10. An unidentified submarine (roughly 380 feet waterline length) was observed at the Yagry Island nuclear submarine special support facility. If this submarine is an "E-II" Class SSGN, its presence at the support facility could indicate that the first re-coring of a "E-II" Class submarine is beginning.

"11. Both of the helicopter carriers were observed. The Moskva was moored at Sevastopol. There were no helicopters observed on the flight deck although the forward elevator was open. The second unit of this class, the Leningrad, was observed still fitting out at a shipyard in Nikolayev.

"12. Two new graded earth staging airfields were discovered in the Turkestan Military District about 45 nautical miles north of the Chinese border. A total of 13 such airfields have been detected since 1964. Most of them are in the Turkestan Military District but three are in the Soviet Far East. Two more regimental sized barracks together with equipment parking areas have been constructed at Ulan Ude. Prior to this new construction the installation was believed to be sufficient for a full division.

"13. The Lop Nor Nuclear testing site was the only major advanced weapons facility covered in China. Ground Zeros 1, 2, and 3 were all covered. No indication of preparations for another nuclear test was in evidence at this time. Both of China's TU-16 medium jet bombers which have been used previously for air drop tests were observed at their home base at Sian on 27 June."

[REDACTED]
Page Twenty-nine

CORONA
~~TOP SECRET DUE TIME~~

[REDACTED] HANDLE VIA
[REDACTED] TALENT-KEYHOLE [REDACTED]
CONTROL SYSTEMS [REDACTED]

CORONA

~~TOP SECRET DUE DATE~~

MISSION 1047

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY

Msg. No. [REDACTED]

26 July 1968

"The imagery from Mission 1047 is considered to be average. The PI's reported mission photography as being of normal image quality. Photography from the aft camera is noticeably superior to that from the forward unit."

[REDACTED] TWX

Mission 1047-1

"Good but not as good as recent missions. An MIP of 85 is assigned. A slightly out of focus area starts about the middle of the mission and becomes more apparent towards the end of the mission."

[REDACTED] TWX

Mission 1047-2

"Good and comparable to Mission 1047-1. An MIP of 85 is assigned."

NPIC Photographic Evaluation Report

Not available yet.

[REDACTED]
Page thirty

CORONA

~~TOP SECRET DUE DATE~~

[REDACTED] HANDLE VIA
[REDACTED] TALENT KEYHOLE [REDACTED]

BORDNA

~~TOP SECRET BUREAU~~

MISSION 1101-1

16 - 21 September 1967

PRELIMINARY ASSESSMENT [REDACTED]

27 September 1967

"1. Mission 1101 is the first satellite operation using a new camera system--the KH-4B. The camera, designed to provide better resolution, did not in this mission produce photography comparable to the best obtained by the KH-4A system. More large single silos under construction and another Tallinn-type complex were discovered."

COMMENT: It should be noted that the MIP assigned by NPIC was 95 and that is higher than the MIP of any KH-4A system. The paragraphs that followed were objectively reported and will not be quoted here.

MISSION 1101-2

21 - 28 September 1967

PRELIMINARY ASSESSMENT [REDACTED]

13 October 1967

"1. Mission 1101-2 is the second part of a KH-4 operation using a new low resolution camera system. While little significant new intelligence was obtained, the mission did provide continuity on military programs now underway in the USSR and China. In addition, good photography was obtained over most of North Korea."

COMMENT: The paragraphs that followed were objectively reported.

BORDNA

~~TOP SECRET BUREAU~~

[REDACTED]
Page Thirty-one

[REDACTED] HANDLE VIA
TALENT KEYHOLE
CONTROL [REDACTED]

CORONA

~~TOP SECRET~~

MISSION 1101

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY Msg. No. [REDACTED] 21 October 1967

"The best photography of Mission 1101 is equal to or better than any previous CORONA photography. The best photography from 1101 was obtained with the fwd-looking camera. The aft-looking camera produced softer imagery than normally obtained with the CORONA system because of an out-of-focus condition (see section four). Several CORN and fixed resolution targets were recorded. Readings of these targets give an indication of the system performance. The best targets observed yielded approximately six feet ground resolved distance along the line of flight (IMC direction), and ten feet across the line of flight (scan direction). The photo interpretability of the forward-looking camera product generally ranges from fair to good throughout the first half of the mission and is generally good throughout the second half of the mission. The product of the aft camera is considered to be only fair to poor for photo interpretation throughout the mission. The overall information content of the second half of the mission is improved, compared to that of the first half, in association with the shift in perigee which resulted in larger scale photography over the prime target areas. The image quality of the forward camera photography recovered from Mission 1101-2 is judged to be good and comparable to the best ever produced by the CORONA camera system."

[REDACTED] TWX

Mission 1101-1

"The image quality of the fwd-looking camera record is good and comparable to the better J-1 missions; however, it is not comparable to the best imagery obtained from the J-1 system. The image quality of the aft-looking camera record is not comparable to that obtained from the forward camera. The imagery is soft and has an out-of-focus appearance. Edges are not well defined. A single one quarter of an inch wide band appears at approximately three quarters of an inch from the take up end of each aft camera frame. The imagery in this band is grossly smeared."

[REDACTED] TWX

Mission 1101-2

"The best image quality of the fwd-looking camera record is good and compares favorably with the best imagery obtained

CORONA

~~TOP SECRET SUEZ CANAL~~

MISSION 1101 (Continued)

from the J-1 system. The image quality of the aft-looking camera is not comparable to the fwd-looking camera. The imagery is soft and has an out of focus appearance. A band of grossly smeared imagery, approximately one quarter of an inch wide, appears about three quarters of an inch from the take up end of each aft camera frame."

NPIC Photographic Evaluation Report [REDACTED] February 1968

"Both panoramic cameras were operational throughout Mission 1101. The best photography was obtained from the fwd-looking camera and is equal to or better than the photography of any J-1 mission. The aft camera imagery is out of focus throughout the mission. Several CORN and fixed resolution targets were covered....

"The Mission Information Potential (MIP) rating for this mission is 95, the highest MIP rating to date."

A summary of the PI Quality Ratings was given as follows:

Good	14%
Fair	57%
Poor	29%

[REDACTED]
Page Thirty-three

CORONA

~~TOP SECRET SUEZ CANAL~~

HANDLE VIA

TALENT KEYHOLE [REDACTED]

CORONA

~~TOP SECRET RUMBLE~~

MISSION 1102-1

10 - 14 December 1967

PRELIMINARY ASSESSMENT

[REDACTED] 29 December 1967

"1. The intelligence discoveries from the first bucket of KH-4B Mission 1102 were highlighted by the appearance of what is probably a mock-up of the USSR's latest space booster rocket erected on a pad at Tyuratam's new space complex, the start of a new group of prototype silos at Tyuratam, and further expansion of Soviet strategic missile deployment.

"2. Mission 1102 was the second Keyhole mission using the improved KH-4B camera system operationally. It was flown at a lower altitude than earlier KH-4 missions to enlarge the scale of the photography--at some cost in total area coverage. A precise measure of the improvement must await a detailed study now underway. In the initial look, photo-interpreters felt that the image quality approached the best ever obtained with the KH-4 system and that the larger scale will prove useful."

COMMENT: Usually the authors of this paper are indicating that readout is hampered by small scale whereas above, though they mention that there is a larger scale, it is pointed out that this cost total area coverage--a bit puzzling. As compared with the 1101 report where it was pointed out that the first KH-4B was not as good as the best KH-4A's, this report does not make a comparison in this case and there was no doubt that this KH-4B system was better than any previous KH-4 mission. Several pages of intelligence finds were reported objectively.

[REDACTED]
Page Thirty-four

CORONA

~~TOP SECRET RUMBLE~~

HANDLE VIA
ALENT KEYHOL [REDACTED]

CORONA

~~TOP SECRET~~

MISSION 1102-2

15 - 22 December 1967

PRELIMINARY ASSESSMENT

[REDACTED] 3 January 1968

"1. A substantial buildup of military equipment in the Kunming area of southwest China highlighted the findings of Mission 1102-2, the second half of a 13-day KH-4B operation. The improved scale and quality of this coverage compared to earlier KH-4 photography facilitated the identification of the equipment.

"2. In addition to extensive coverage of the USSR and China, the mission covered nearly all of Egypt, Israel, and North Vietnam, and about half of North Korea was seen in virtually cloud-free photography."

COMMENT: Note that in para 1 above a comparison of this KH-4B to previous KH-4 systems was mentioned. Several pages of intelligence finds again were objectively reported.

[REDACTED]
Page thirty-five

CORONA

~~TOP SECRET~~

HANDLE VIA
TALENT KEYHOLE

CORONA

~~TOP SECRET~~

MISSION 1102

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY Msg. No. [REDACTED] 13 January 1968

"The PET group and photointerpreters agree that the best photography of Mission 1102 is better than any previous CORONA photography. The performance of the forward-looking camera appears to be slightly better than the aft-looking camera. The forward-looking camera, however, contained a second generation lens which had a slightly higher preflight performance than the first generation lens in the aft-looking camera. Nine mobile and fixed CORN targets were recorded. The best targets observed in the 0. neg yielded approximately six feet ground resolved distance along the line of flight (IMC direction) and seven feet across the line of flight (scan direction) for the aft-looking camera; the forward-looking camera yielded approximately six feet in both directions. Several very favorable factors combined to produce the best CORONA mission to date. The primary factors were good atmospheric conditions, increased scale through lower altitude and improved camera performance."

[REDACTED] TWX

Mission 1102-1

"The image quality of the fwd looking camera is good and slightly better than that obtained from the aft camera. The best imagery of both camera records is better than the best imagery observed on Mission 1101-2. Therefore an MIP of 95 is assigned to Mission 1101-2 and an MIP of 100 is assigned to Mission 1102-1."

[REDACTED] TWX

Mission 1102-2

"The image quality of the forward looking camera record is good and slightly better than that obtained from the aft camera. The best imagery is comparable to Mission 1102-1. An MIP of 100 is assigned."

NPIC Photographic Evaluation Report [REDACTED] June 1968

"The best photography of Mission 1102 is considered to be better than any previous photography from this system...."

[REDACTED]
Page Thirty-six

CORONA
~~TOP SECRET~~

[REDACTED] HANDLE VIA
[REDACTED] TALENT KEYHOLE
[REDACTED] CONTROL SYSTEMS JOINTLY

CORONA

~~TOP SECRET BUREAU~~

MISSION 1102 (Continued)

"An MIP of 100 is assigned to this mission."

A summary of PI Quality Ratings was given as follows:

Good	27.5%
Fair	58.8%
Poor	13.7%

CORONA

~~TOP SECRET BUREAU~~

[REDACTED]
Page Thirty-seven

~~HANDLE VIA~~

~~TALENT KEYHOLE~~

~~CONTROL SYSTEMS JOINTLY~~

CORONA

~~TOP SECRET RUMBLE~~
MISSION 1103-1

2 - 8 May 1968

PRELIMINARY ASSESSMENT [REDACTED]

16 May 1968

"1. KH-4B Mission 1103-1 of 2-8 May photographed portions of the USSR, China, North Korea and North Vietnam. Coverage of the USSR included the Sary Shagan and Tyuratam missile test centers and ten of the 25 ICBM complexes. Photography of China revealed the completion of two new jet-capable airfields in the central portion of the country. Coverage of North Korea showed three new unoccupied SA-2 SAM sites. North Vietnam was cloud-covered. No usable coverage of Eastern Europe was obtained by the mission."

COMMENT: Purely objective. The rest of the report was fairly objective.

MISSION 1103-2

8 - 15 May 1968

PRELIMINARY ASSESSMENT [REDACTED]

23 May 1968

"1. KH-4B Mission 1103-2 photographed the USSR's western, Ural and Sino-Soviet border areas, and parts of north central and eastern China. Most of Eastern Europe--including the Czechoslovak border areas--also was covered. Coverage of north-eastern North Korea and northwestern North Vietnam revealed no significant activity. The quality of the mission's photography was generally fair."

COMMENT: Note that an overall mission quality of generally fair was given. The remainder of the report was objective.

[REDACTED]
Page Thirty-eight

CORONA

~~TOP SECRET RUMBLE~~

[REDACTED] HANDLE VIA
[REDACTED] TALENT KEYHOLE [REDACTED]
[REDACTED]

CORONA

~~TOP SECRET~~

MISSION 1103

OTHER ASSESSMENTS

PEIR PERFORMANCE SUMMARY

Msg. No. [REDACTED]

14 June 1968

"The PET judged the general image quality of Mission 1103 as fair, and not as good as Mission 1102. There was a significant variability in image quality that was greater than normally encountered with a CORONA system. This variability ranges from rather good to poor. The photointerpreters reported that, 'The interpretability of the imagery on this mission is considered to be more variable than the imagery obtained on Missions 1101 and 1102. In addition, the imagery of the fwd looking camera record is superior to that of the aft camera in almost every case. The overall mission interpretability is rated as fair.'..."

[REDACTED] TWX

Mission 1103-1

"The best imagery of the fwd-looking camera record is comparable to that obtained from Mission 1101 and an MIP of 95 is assigned."

[REDACTED] TWX

Mission 1103-2

"The best image quality of the forward-looking camera record is equal to the best obtained on Mission 1103-1 and an MIP of 95 is assigned. This "best" quality is, however, not indicative of the overall mission quality...."

NPIC Photographic Evaluation Report [REDACTED]

September 1968

"The best image quality of the fwd-looking camera record is superior to that of the aft-looking camera record in almost every case. The general image quality of the mission is considered to be fair and not as good as Mission 1102. Out-of-focus imagery is present on both main camera records...."

"An MIP of 95 is assigned to this mission."

A summary of PI Quality Ratings was given as follows:

Good	5%
Fair	63%
Poor	32%

CORONA

[REDACTED] Page thirty nine

[REDACTED] HANDLE VIA
[REDACTED] TALENT NETWORK [REDACTED]