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BYE-44232/67

**BLACK SHIELD Reconnaissance Missions
31 May - 15 August 1967**

DST-BS/BYE/67-1
22 September 1967

CENTRAL INTELLIGENCE AGENCY

Directorate of Science and Technology

APPROVED FOR RELEASE
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PREFACE

This report is the first of a series of resumes of the BLACK SHIELD reconnaissance missions flown over North Vietnam. This first resume spans the period from 31 May 1967 to 15 August 1967

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**BLACK SHIELD Reconnaissance Missions
31 May - 15 August 1967**

SUMMARY

Fifteen BLACK SHIELD high-altitude reconnaissance missions were alerted during the period from 31 May to 15 August 1967. Seven of the 15 missions were flown, four of which were detected and tracked; there were no mission aborts. (Appendix I lists these missions and related significant events.)

The program's success in its primary mission can be measured by the fact that the two BLACK SHIELD missions flown on 19 and 20 July provided clear photographic coverage of 80 percent of North Vietnam and nearly total clear coverage of the primary SSM search areas. This enabled NPIC to state, with 80 percent confidence, that there were no SSM sites in North Vietnam as of mid-July 1967.

The BLACK SHIELD program has also done well in obtaining baseline coverage. There is now clear, interpretable photography of all of North Vietnam except the Cao Bang - Lang Son area in the northeast adjacent to the Chinese border. (See samples of mission photography at the end of this report.) BLACK SHIELD photography has also been invaluable in providing unique order of battle information on fighter aircraft and surface-to-air missiles (SAMs). Several missions have obtained simultaneous coverage of all or nearly all the major airfields of North Vietnam and have made possible some significant refinements in the current air order of battle. The simultaneous coverage of SAM sites--more than 80 percent of the sites were covered by one mission--has given US forces in the theater of operations a quick and fairly comprehensive reading on which sites are occupied.

The program has contributed substantially to bomb damage assessment of point targets and to assessment of the interdiction effort against North Vietnamese road, rail, and water transportation. The BLACK SHIELD missions have identified new potential targets for US air strikes, [REDACTED]

[REDACTED]
[REDACTED] Based on photography from back-to-back missions BX6709 and BX6710, the North Vietnamese rail inventory is now estimated to be approximately three times larger than previously believed. [REDACTED]

[REDACTED]
[REDACTED]

[REDACTED]

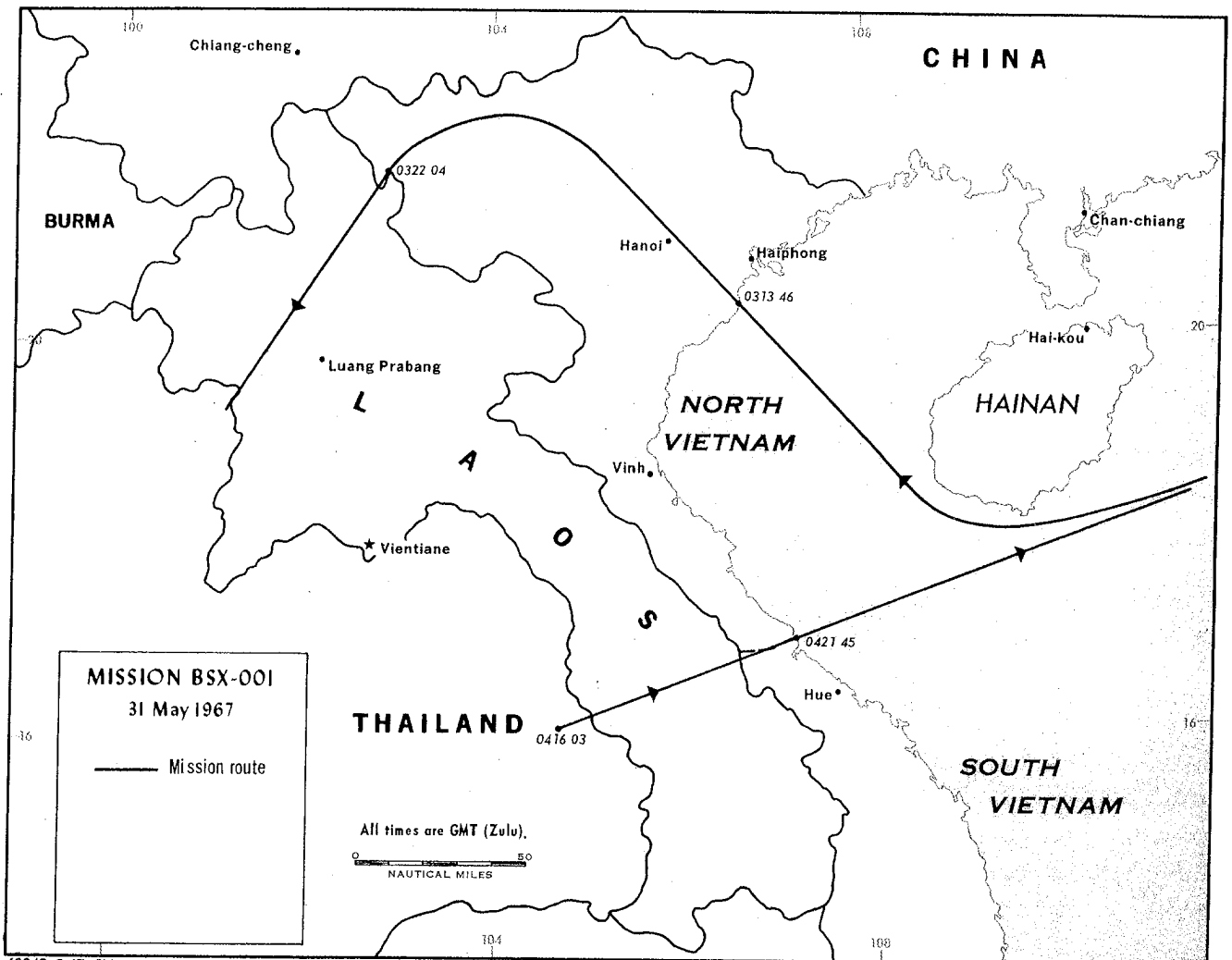
[REDACTED]

There were no known weapons reactions to any BLACK SHIELD missions despite the fact that the SAM environment overflown is known to be the densest in existence.

MISSION ANALYSIS

BSX-001

BSX-001 was a single-pass reconnaissance mission flown over North Vietnam on 31 May 1967. The mission aircraft entered North Vietnam over Haiphong at 0313:46Z and exited over the demilitarized zone (DMZ) at 0421:45Z. Figure 1 shows the flight route.



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Mission photography did not give any evidence of offensive surface-to-surface missile equipment (SSM) or facilities. There were 190 known North Vietnamese SA-2 sites before the mission. Seventy of these sites were photographed by BSX-001, as was the [redacted]. Nine of the 27 COMIREX Priority I targets in North Vietnam were covered by this mission.

There was no indication of [redacted] North Vietnamese tracking. [redacted]

[redacted] There was no indication of a weapons reaction while the mission aircraft was over hostile territory.

The Department of Defense (DOD) strike/jamming operations during the mission flight period were light. No EB-66B or EB-66C jamming aircraft were operational during the reconnaissance mission.

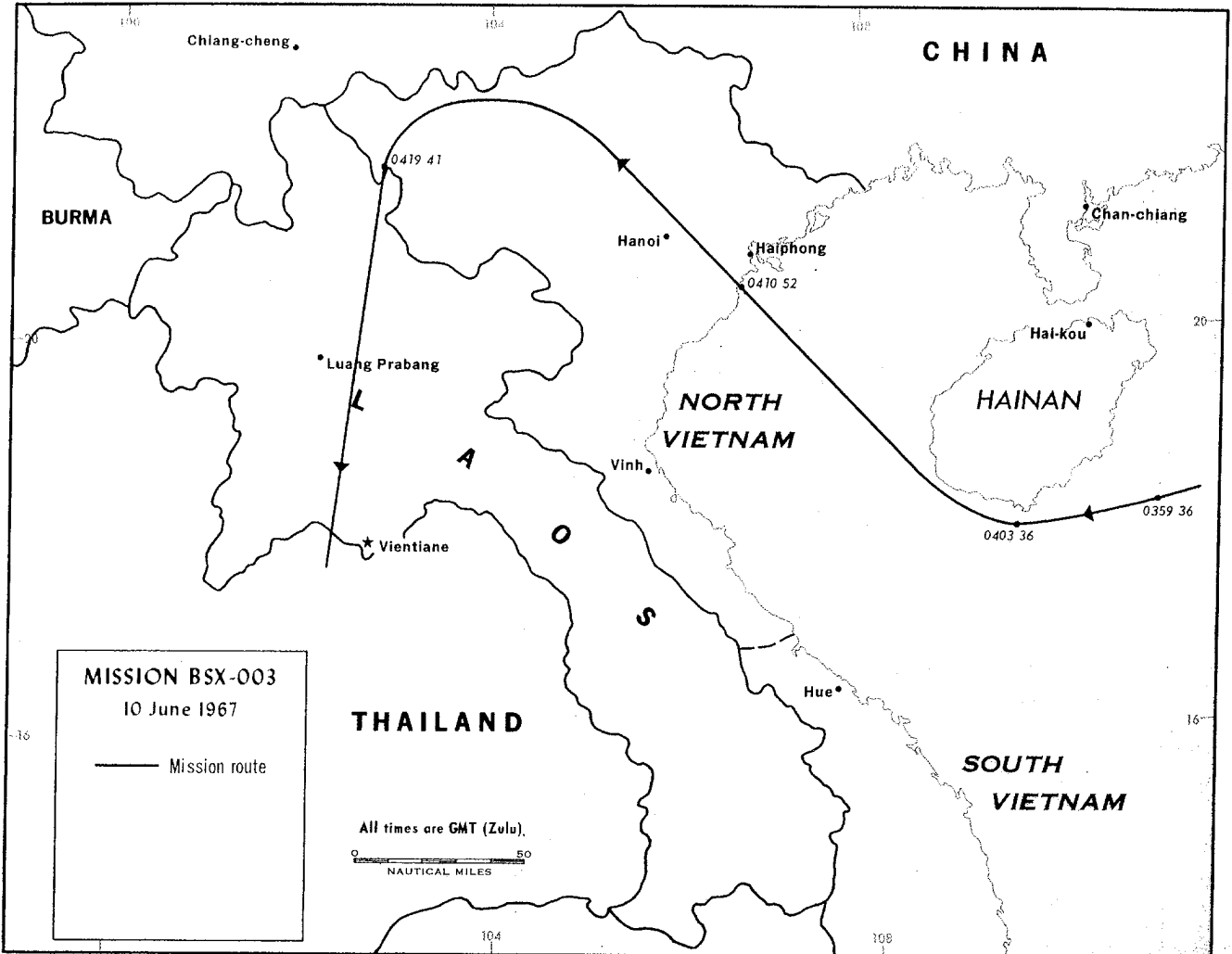
BSX-003

BSX-003 was a single-pass reconnaissance mission flown over North Vietnam on 10 June 1967. The mission aircraft entered North Vietnam over Haiphong at 0410:52Z and exited at 0419:41Z. Figure 2 is a plot of the flight route.

Mission photography did not give any evidence of offensive SSM equipment or facilities. There were 193 known North Vietnamese SA-2 sites before the mission. Ninety-seven of these sites were photographed by BSX-003, including four previously unidentified sites. Of the SA-2 sites photographed, 18 were occupied. Thirteen of the 27 COMIREX Priority I targets in North Vietnam were covered on this mission.

There was no indication of tracking or a weapons reaction by [redacted] the North Vietnamese. [redacted]

[redacted] The DOD operational strike/jamming activity was heavy during the overflight period. Four EB-66C and one EB-66B aircraft conducted barrage and spot jamming during this period, affecting numerous early warning and fire control radars.

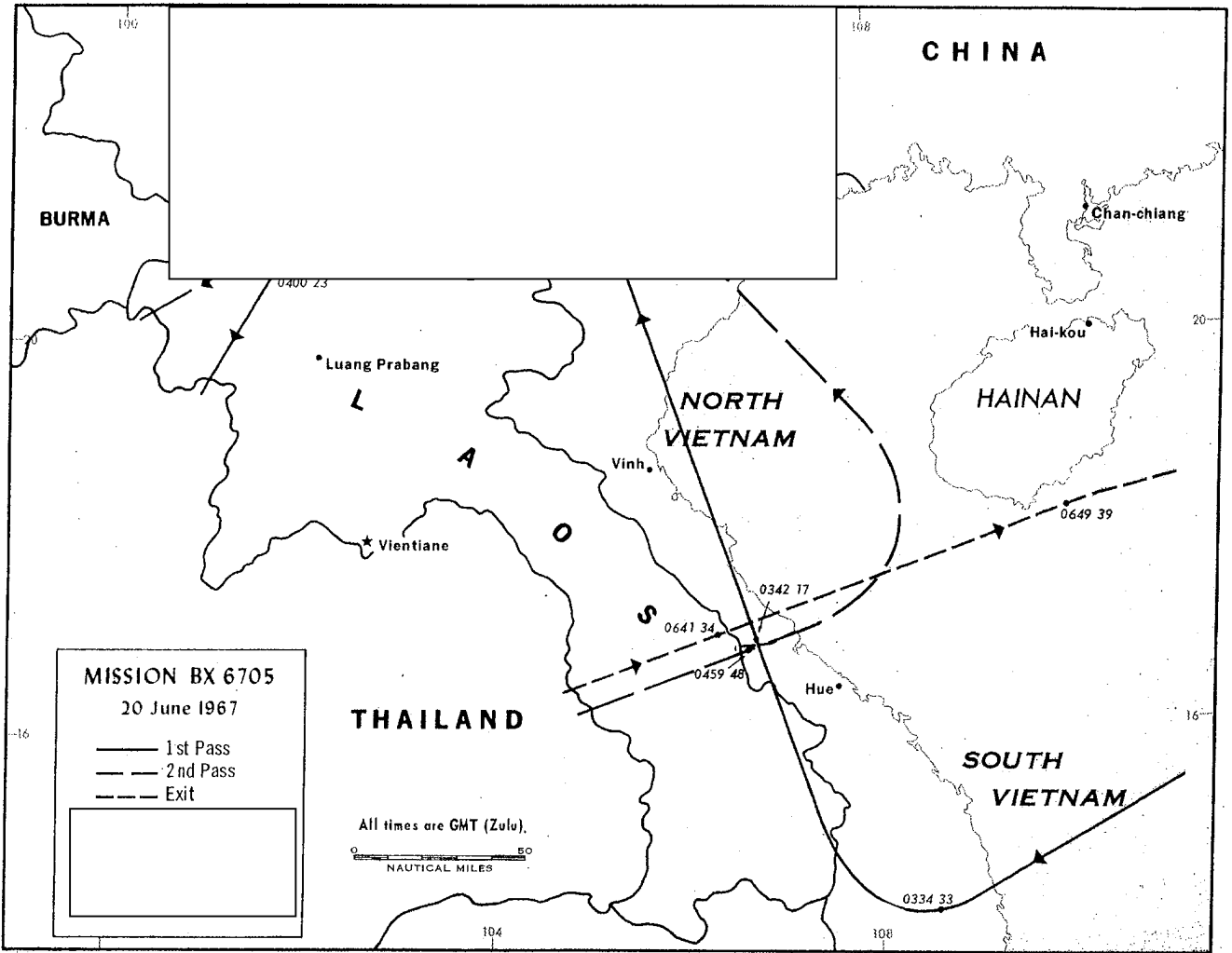


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Figure 2

BX6705

BX6705 was a double-pass reconnaissance mission flown over North Vietnam on 20 June 1967. The mission aircraft penetrated and exited over the DMZ at 0342:17 Z and 0641:58 Z, respectively. Figure 3 shows the mission route and associated events.



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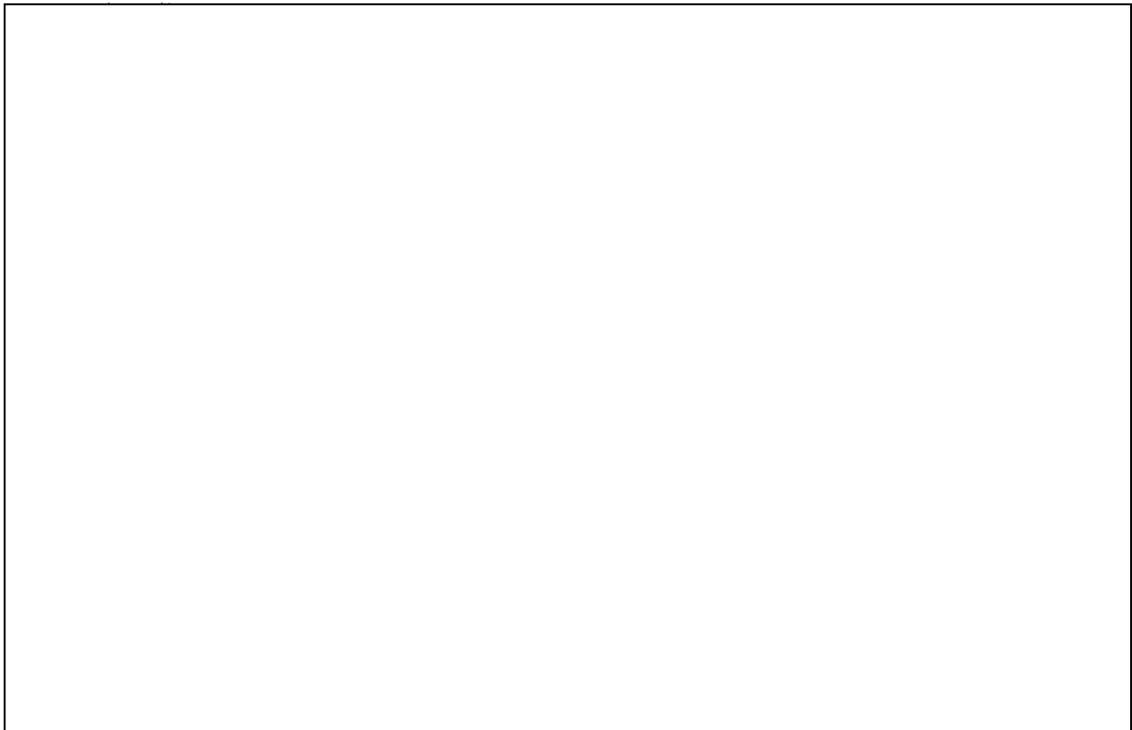
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Figure 3

Mission photography did not give any evidence of SSM equipment or facilities in North Vietnam. There were 200 known North Vietnamese SA-2 sites before the mission. One hundred and thirty three sites were photographed by BX6705 including two previously unidentified sites. Of the sites covered, 20 were occupied. Seventeen of the 27 COMIREX Priority I targets in North Vietnam were covered.

There were no known hostile weapons reactions to the mission aircraft. [REDACTED]

[REDACTED] The pilot did exercise the Big Blast* manual jam override while adjacent to Hainan Island on the return leg of the route.



No DOD operational reporting available accounts for the above jamming activity. No BLACK SHIELD aircraft jammers were operated during this period. SIP, an Elint collection package, was inoperable during the tracking period and thus it was impossible to correlate the tracking data from the radar stations and the Elint data.

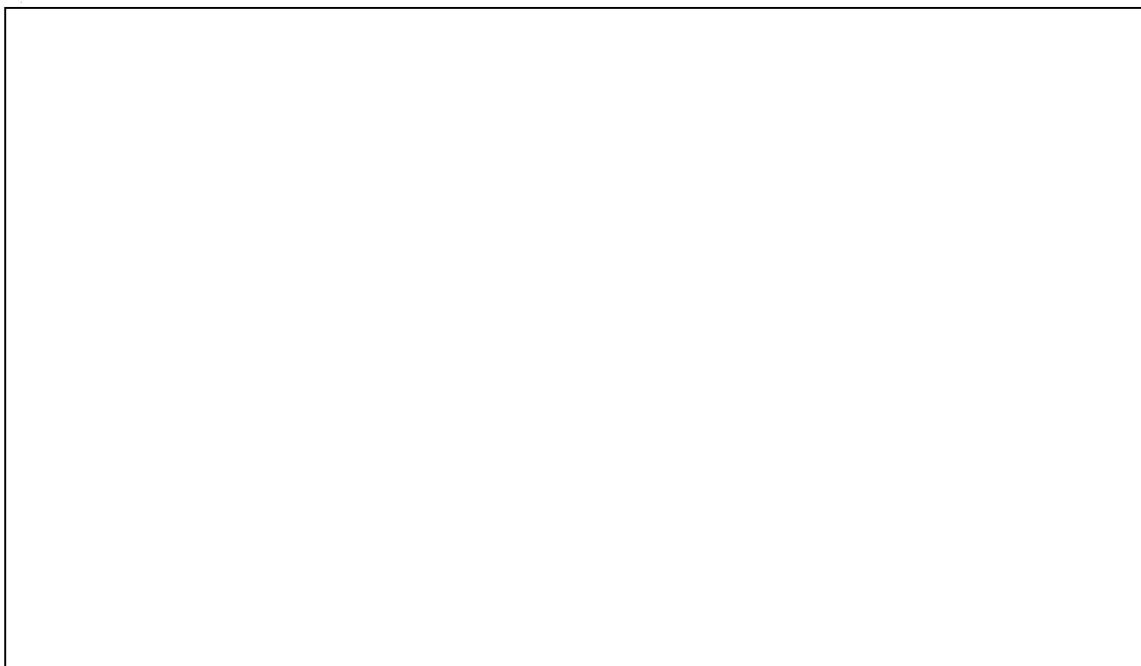
*Big Blast, an on-board defense mechanism, will transmit S- and C-band noise energy for approximately 90 seconds.

[REDACTED] There was no indication of North Vietnamese tracking or the passage of tracking data to the Vietnamese. DOD strike activity was very light during the mission overflight.

BX6706

BX6706 was a double-pass reconnaissance mission flown over North Vietnam on 30 June 1967. The mission aircraft entered Vietnam north of Haiphong at 0415:45Z and exited over the DMZ at 0644:41Z. Figure 4 shows the flight route and associated events.

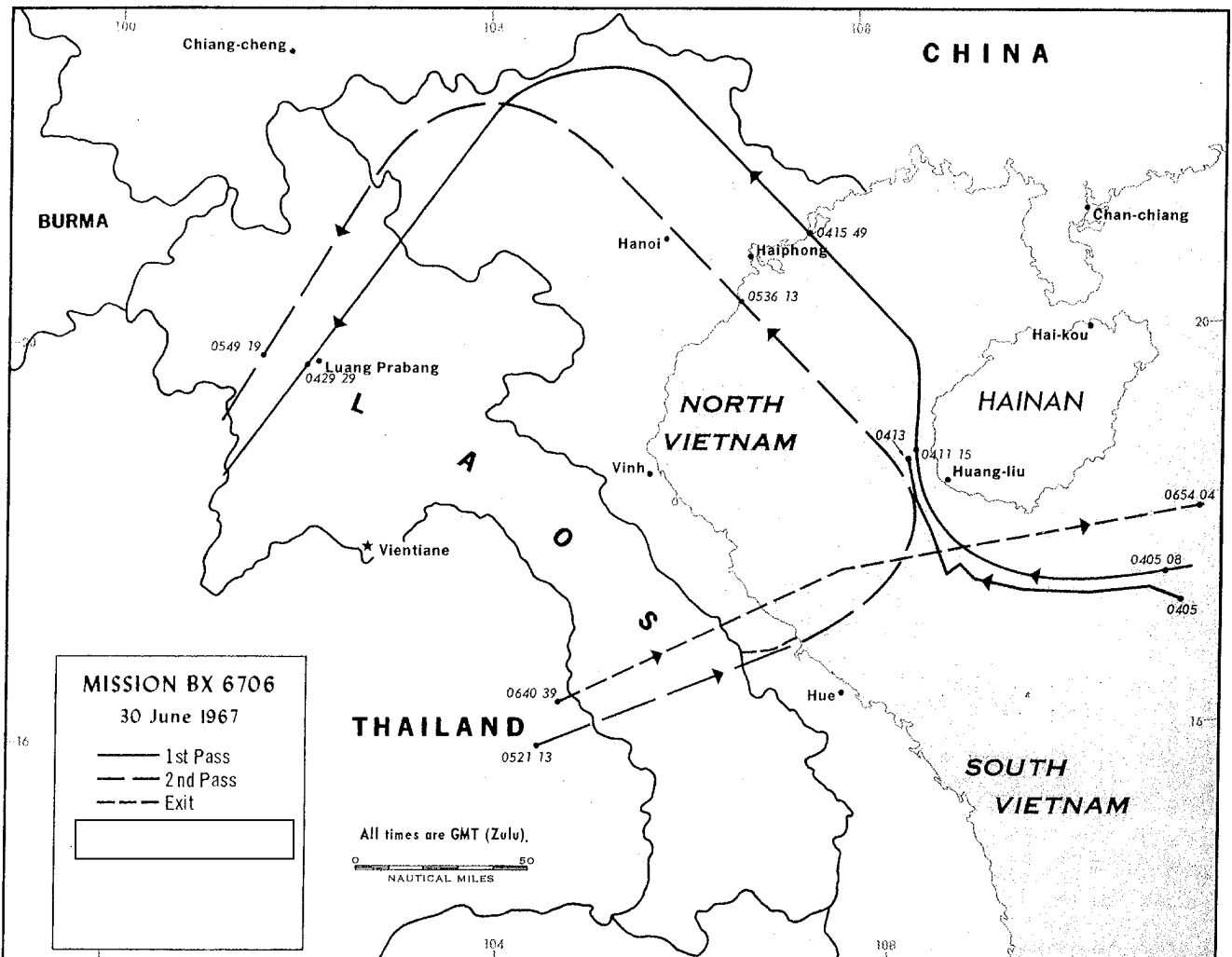
Mission photography did not give any evidence of SSM equipment or facilities. There were 205 known North Vietnamese SA-2 sites before the mission. One hundred and nine sites of these were photographed by BX6706 including three previously unidentified sites. Sixteen of the sites which were photographed were occupied. Twenty-one of the 27 COMIREX Priority I targets in North Vietnam were covered.



[Redacted]

[Redacted] does not give any indication of North Vietnamese tracking during this period.

There were no known DOD strike/jamming operations being conducted during the mission overflight period.



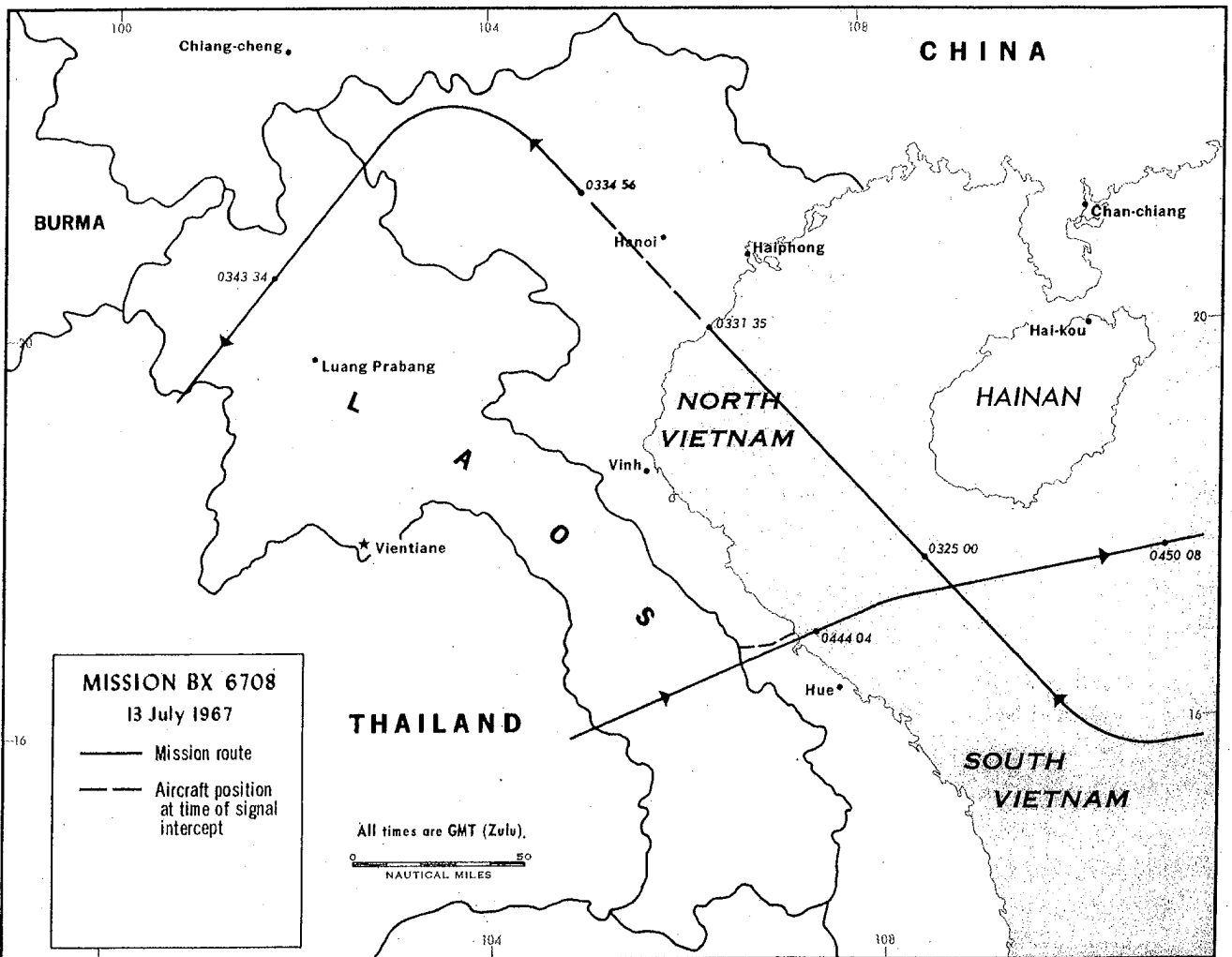
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9 Figure 4

BX6708

BX6708 was a single-pass, high-altitude reconnaissance mission flown over North Vietnam on 13 July 1967. The mission aircraft entered North Vietnam south of Haiphong at 0331:35Z and exited over the DMZ at 0442:03Z. Figure 5 is a map of the mission route and shows associated events.



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Figure 5

Mission photography did not show any evidence of SSM equipment or facilities. There were 214 known North Vietnamese SA-2 sites before the mission. Seventy-one were photographed by BX6708 including one previously unidentified site. Of the 71 sites covered, five were occupied. Eight of the 27 COMIREX Priority I targets in North Vietnam were covered.

There was no indication of a hostile weapons reaction.

[redacted]
These signals did not appear to be tracking the mission aircraft. None of the defensive systems were activated as a result of these signals. There was no [redacted] evidence of mission tracking by [redacted] North Vietnamese radar facilities.

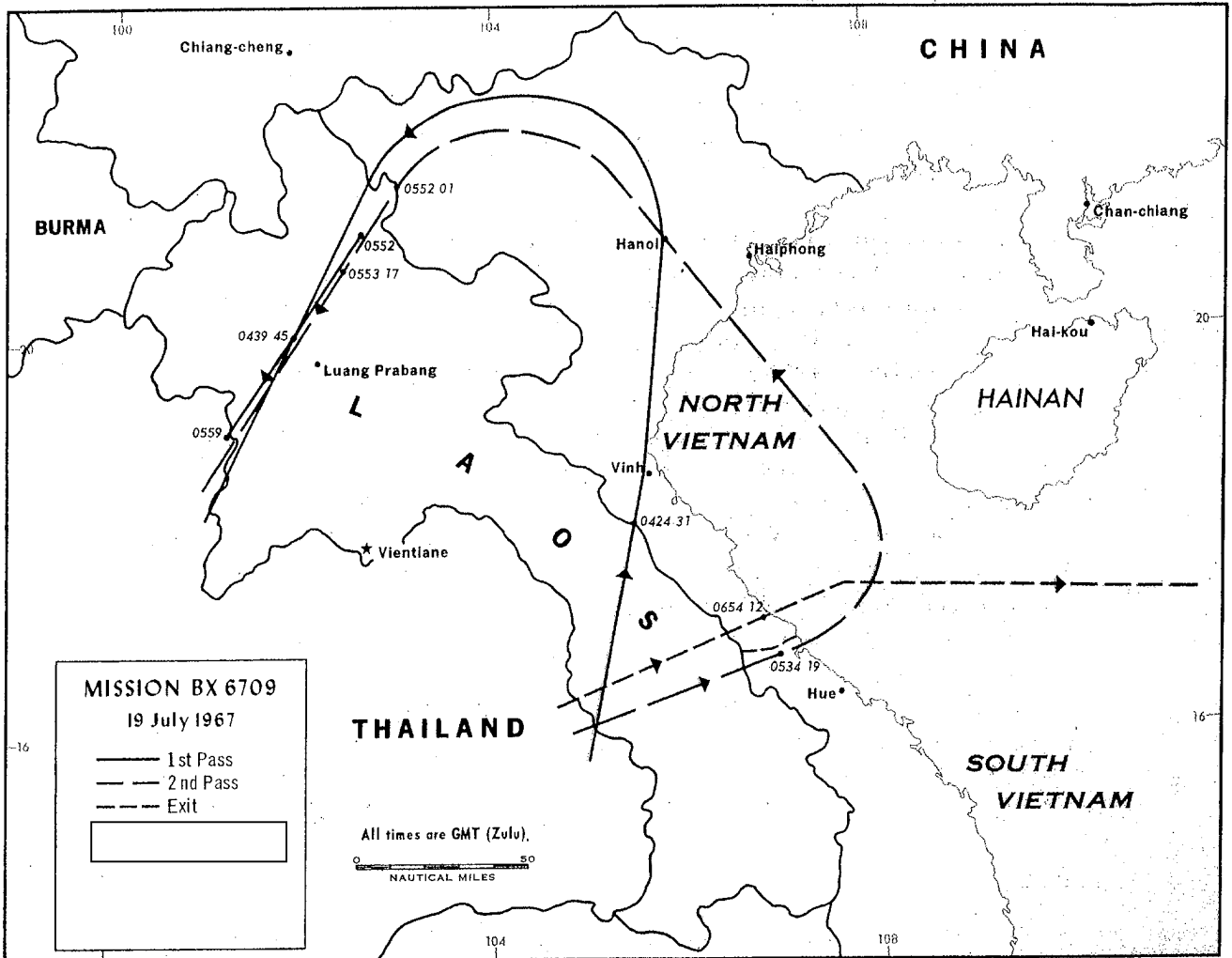
[redacted]
[redacted] there is no [redacted] evidence that would indicate tracking by either the North Vietnamese [redacted]. Figure 5 indicates aircraft position at time of intercept.

There was little or no DOD strike/jamming activity while the mission aircraft was over North Vietnam. One EB-66C, an Elint collection active jamming platform, was orbiting the area during the mission overflight period. Overall signal density was light.

BX6709

BX6709 was a double-pass, high-altitude reconnaissance mission flown over North Vietnam on 19 July 1967. The mission aircraft entered North Vietnam over Vinh at 0424:31Z and exited over the DMZ at 0654:12Z. Figure 6 shows the mission flight route and notes significant events.

Mission photography did not give any evidence of SSM equipment or facilities. There were 215 known SA-2 sites in North Vietnam before the mission. One hundred and sixty-six sites were photographed by BX6709 including two previously unidentified sites. Of the 166 sites photographed, 12 were occupied. Twelve of the 27 COMIREX Priority I targets in North Vietnam were covered.



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Figure 6

There was no indication of a hostile weapons reaction.

[REDACTED]
mission. These signals did not appear to be tracking the mission aircraft. None of the defensive systems were activated as a result of these signals. [REDACTED]

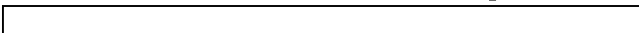


DOD strike/jamming activity was moderately heavy during the mission overflight time period. United States ECM aircraft in operation in the area during the mission overflight period were: two EA3B's, three EA1F's, one EB-66C, and one EB-66B.

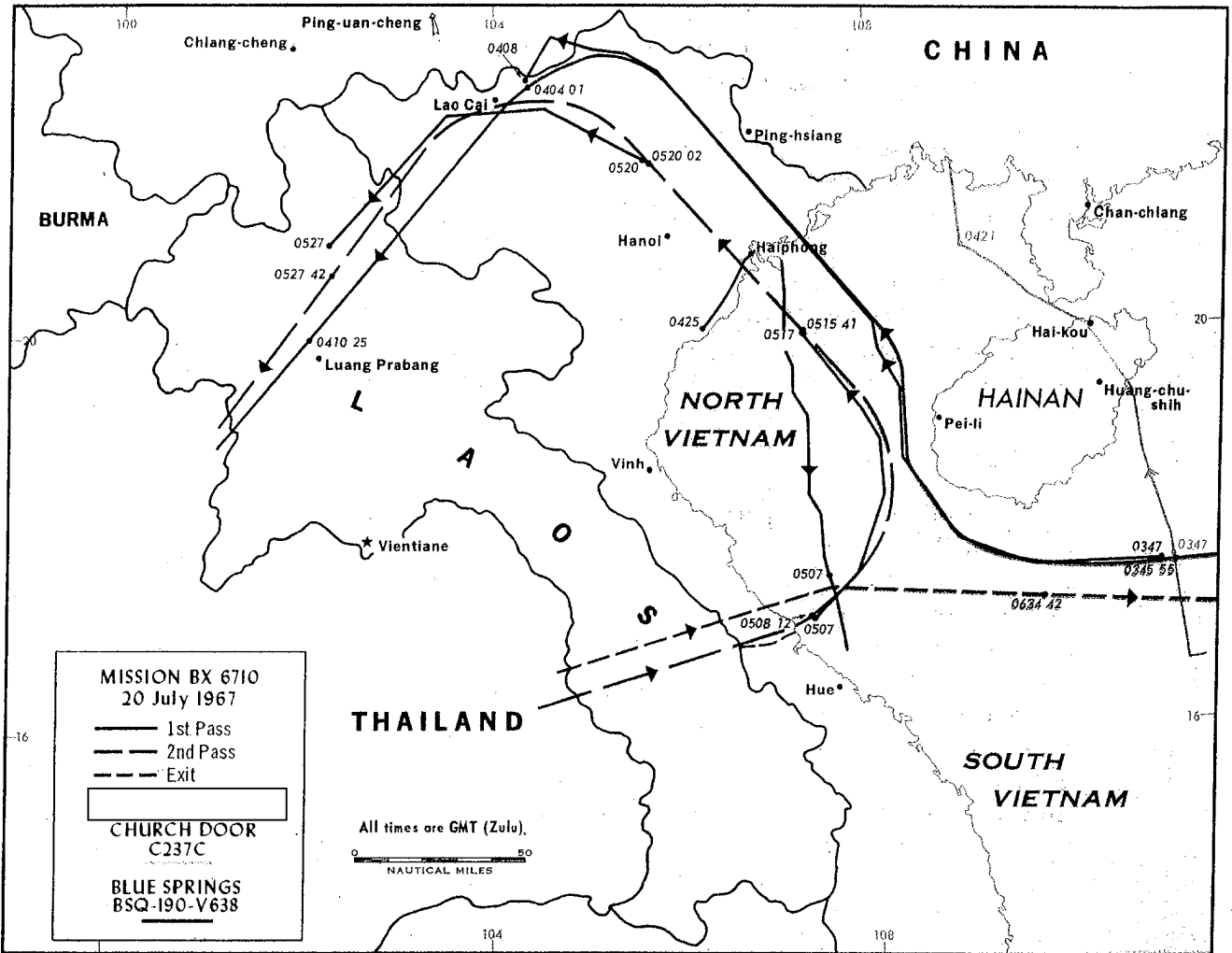
BX6710

BX6710 was a double-pass, high-altitude reconnaissance mission flown over North Vietnam on 20 July 1967. The mission aircraft entered North Vietnam north of Haiphong at 0367:00Z and exited over the demilitarized zone at 0628:33Z. Figure 7 shows the mission route and associated events.

Mission photography did not give any evidence of SSM equipment or facilities. There were 219 known SA-2 sites in North Vietnam before the mission. Eighty sites were photographed by BX6710 including one previously unidentified site. Of the 80 sites covered, five were occupied. Nineteen of the 27 COMIREX Priority I targets in North Vietnam were covered.

A reassessment of North Vietnam's rail inventory from the photography of back-to-back missions BX6709 and BX6710 indicates that the Vietnamese have a rail inventory approximately three times larger than previously believed. On the basis of this photography North Vietnam is now estimated to have 2,000 to 3,000 freight cars and 100 to 120 locomotives. 





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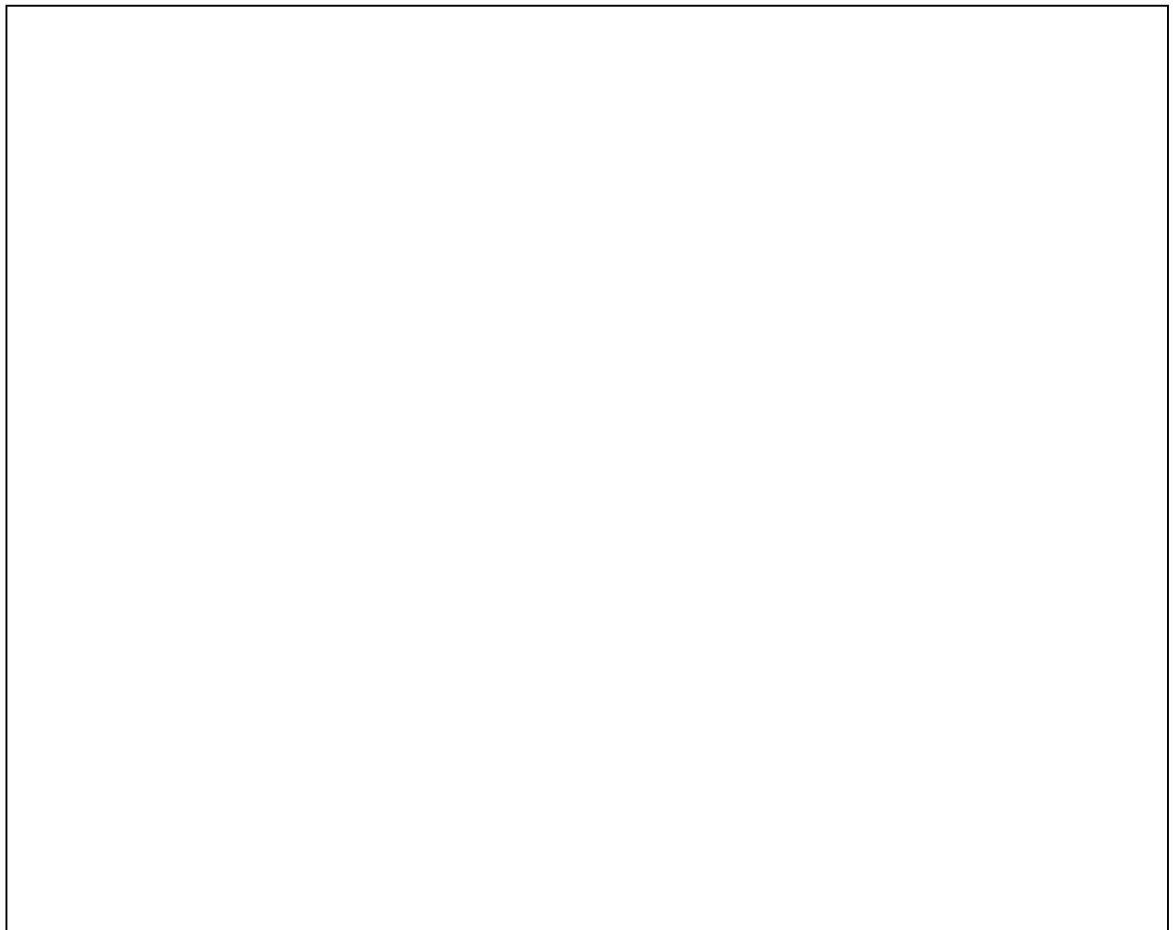
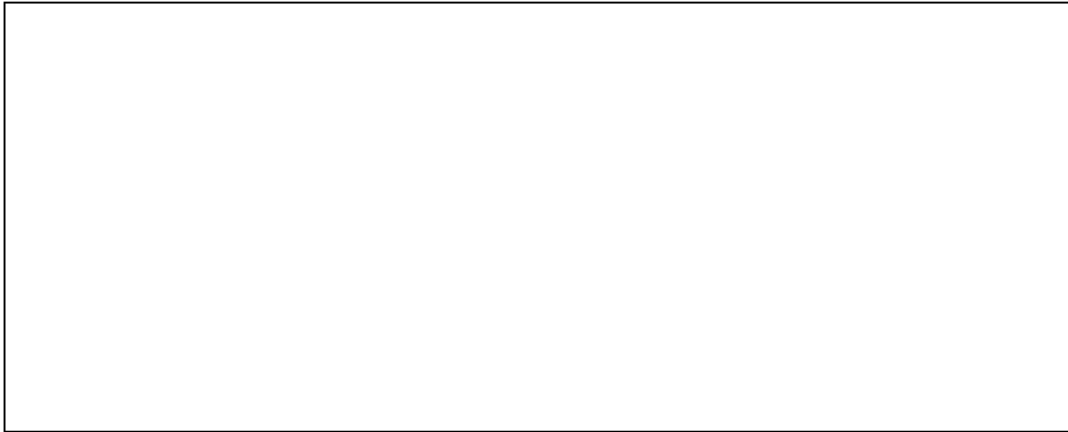
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Figure 7

There was no indication of a hostile weapons reaction to the mission aircraft. [redacted] during this overflight. Two other high-altitude reconnaissance missions were operational during the BX6710 overflight. The flight routes of Church Door C237C and Blue Springs BSQ-190-V638 are shown in figure 7. [redacted]

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DOD strike/jamming operations were light during the mission overflight period.

Cancelled flights

During the period 31 May to 15 August 1967, the following BLACK SHIELD reconnaissance missions were alerted but cancelled because of the poor weather in the target area: BSX-002, 6 June; BX6704, 10 June; BX6707, 30 June; BX6711, 29 July; BX6712, 30 July; BX6713, 13 August; and BX6714 and BX6715, both on 14 August.

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APPENDIX I

BLACK SHIELD Operational Missions Alerted Between
31 May and 15 August 1967

<u>Mission No.</u>	<u>Date (1967)</u>	<u>Remarks</u>
BSX-001	31 May	Flown (Rt. 4)
BSX-002	6 June	Cancelled due to weather (Rt. 4)
BSX-003	10 June	Flown (Rt. 10)
BX6704	10 June	Cancelled due to weather (Rt. 11)
BX6705	20 June	Flown (Rt. 8)
BX6706	30 June	Flown (Rt. 14)
BX6707	30 June	Cancelled due to weather (Rt. 19)
BX6708	13 July	Flown (Rt. 19, modified)
BX6709	19 July	Flown (Rt. 9, modified)
BX6710	20 July	Flown (Rt. 14, modified)
BX6711	29 July	Cancelled due to weather (Rt. 14)
BX6712	30 July	Cancelled due to weather (Rt. 19)
BX6713	13 August	Cancelled due to weather (Rt. 20 A+B)
BX6714	14 August	Cancelled due to weather (Rt. 20 C+D)
BX6715	14 August	Cancelled due to weather (Rt. 20 A+B)

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APPENDIX II

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Date and Mission Number

Item No.	COMIREX No.	31	10	20	30	13	19	20
		May 01	Jun 03	Jun 05	Jun 06	Jul 08	Jul 09	Jul 10
1			X					
2*		X	X	X	X			X
3* **		X	X	X	X		X	X
4*		X	X	X	X	X	X	
5*		X	X	X	X	X	X	X
6* **			X	X	X	X	X	X
7*					X			X
8*			X	X	X		X	X
9				X		X		
10*		X	X	X	X	X	X	
11				X				
12* **		X	X	X	X			X
13*					X			X
14*					X			
15					X			
16*				X			X	
17				X				
18					X			X
19				X				
20					X			X
21								X
22			X	X	X		X	X
23							X	X
24			X	X	X		X	
25			X	X		X	X	
26		X	X	X	X	X	X	X
27		X		X		X	X	
28					X			X
29					X			X
30				X	X		X	X

APPENDIX II (continued)

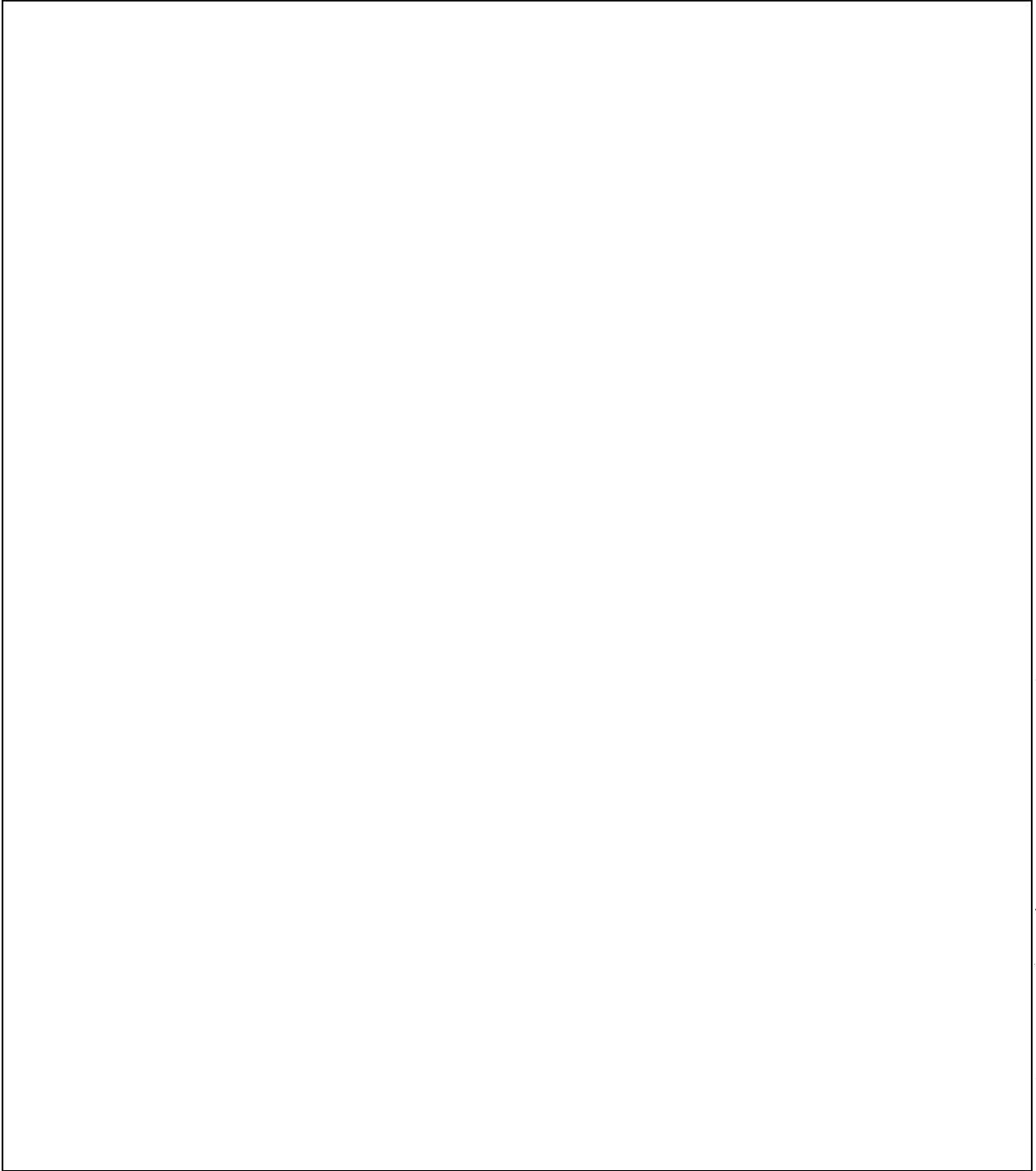
Item No.	COMIREX No.	31	10	20	30	13	19	20
		May 01	Jun 03	Jun 05	Jun 06	Jul 08	Jul 09	Jul 10
31	[REDACTED]	X	X	X	X	X	X	
32		X	X	X	X	X	X	
33*				X	X			X
34* **					X			X
35*				X	X	X	X	X
36*					X			X
37*				X	X	X		X
38*						X		X
39*								
40*						X		X
41*				X	X		X	X
42*					X		X	
43*			X		X	X		X
44* **			X	X	X	X		X
45* **						X		X
46* **					X	X	X	X
47* **			X	X	X		X	X
48* **								X

*Indicates Priority I Targets in North Vietnam.
**Indicates SSM Indicator Targets

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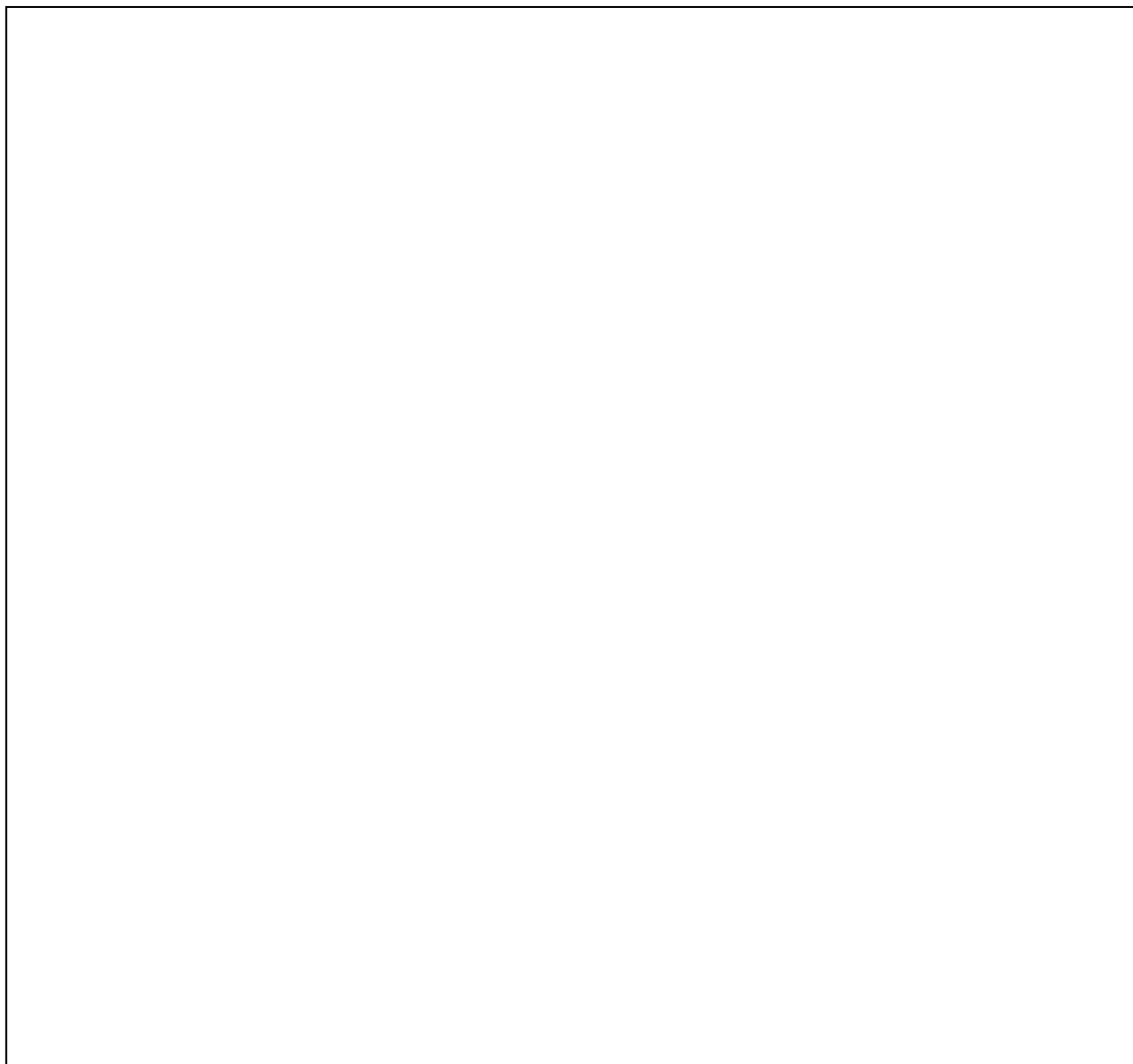
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APPENDIX III



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APPENDIX III (continued)



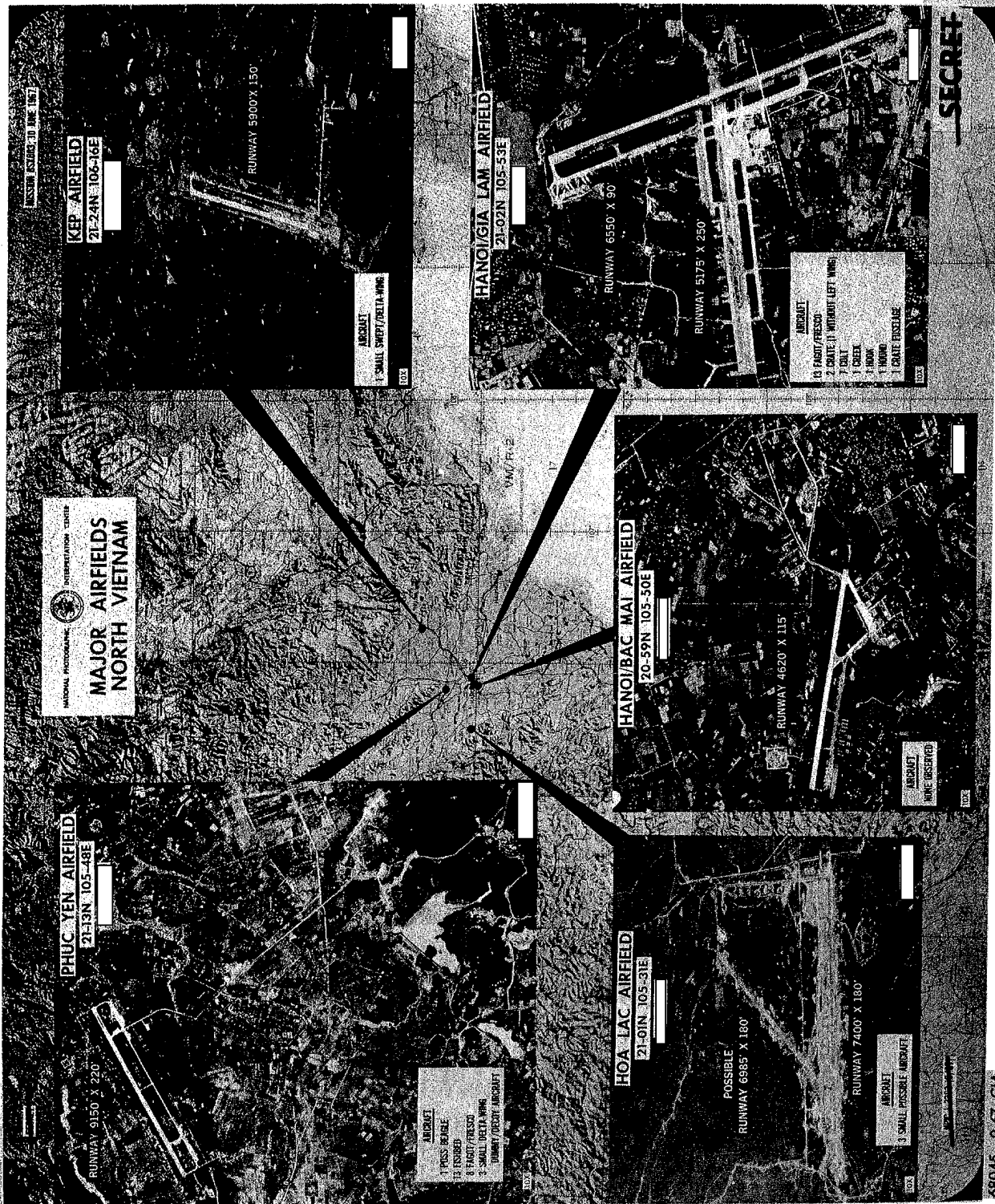
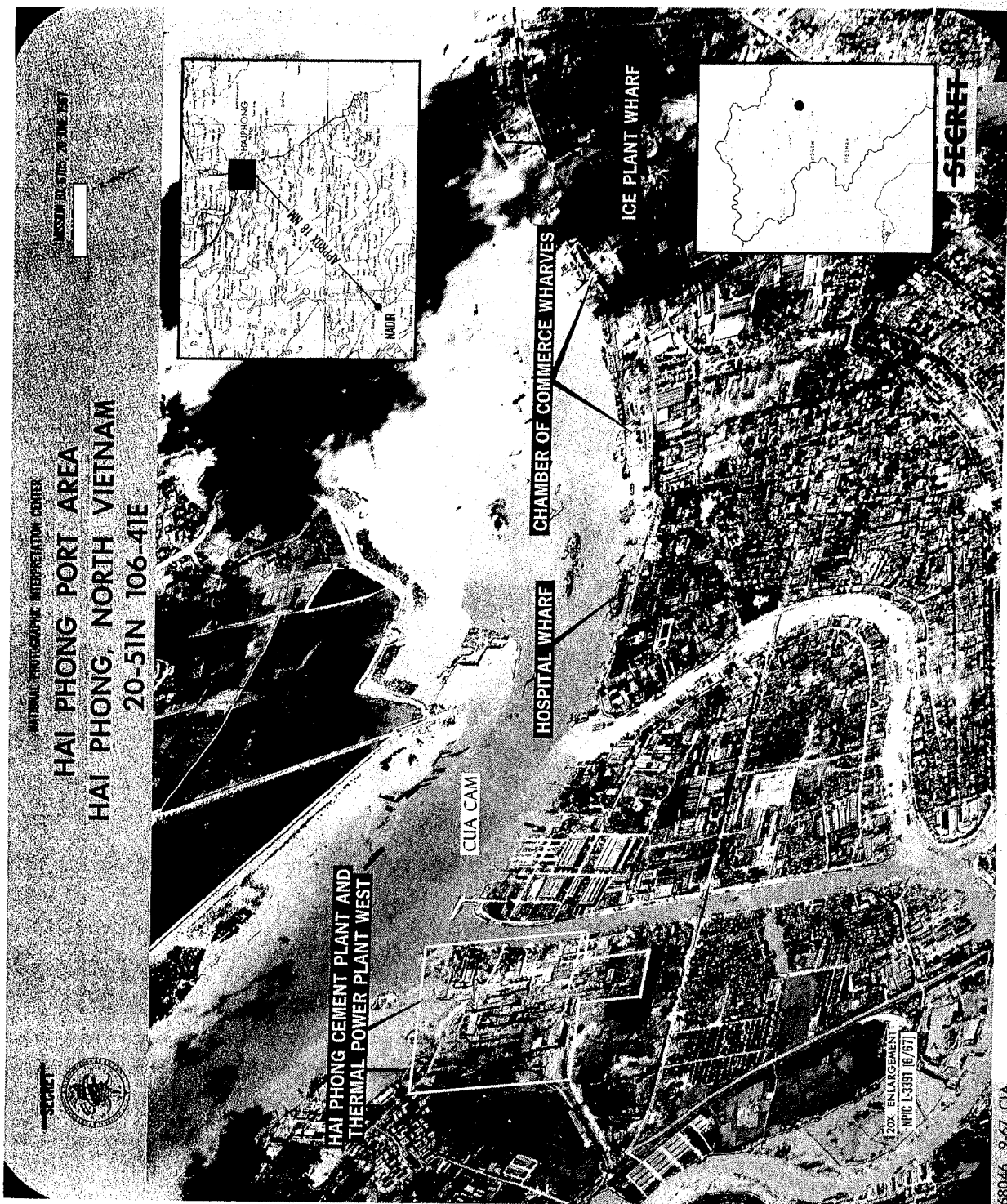


Figure 10

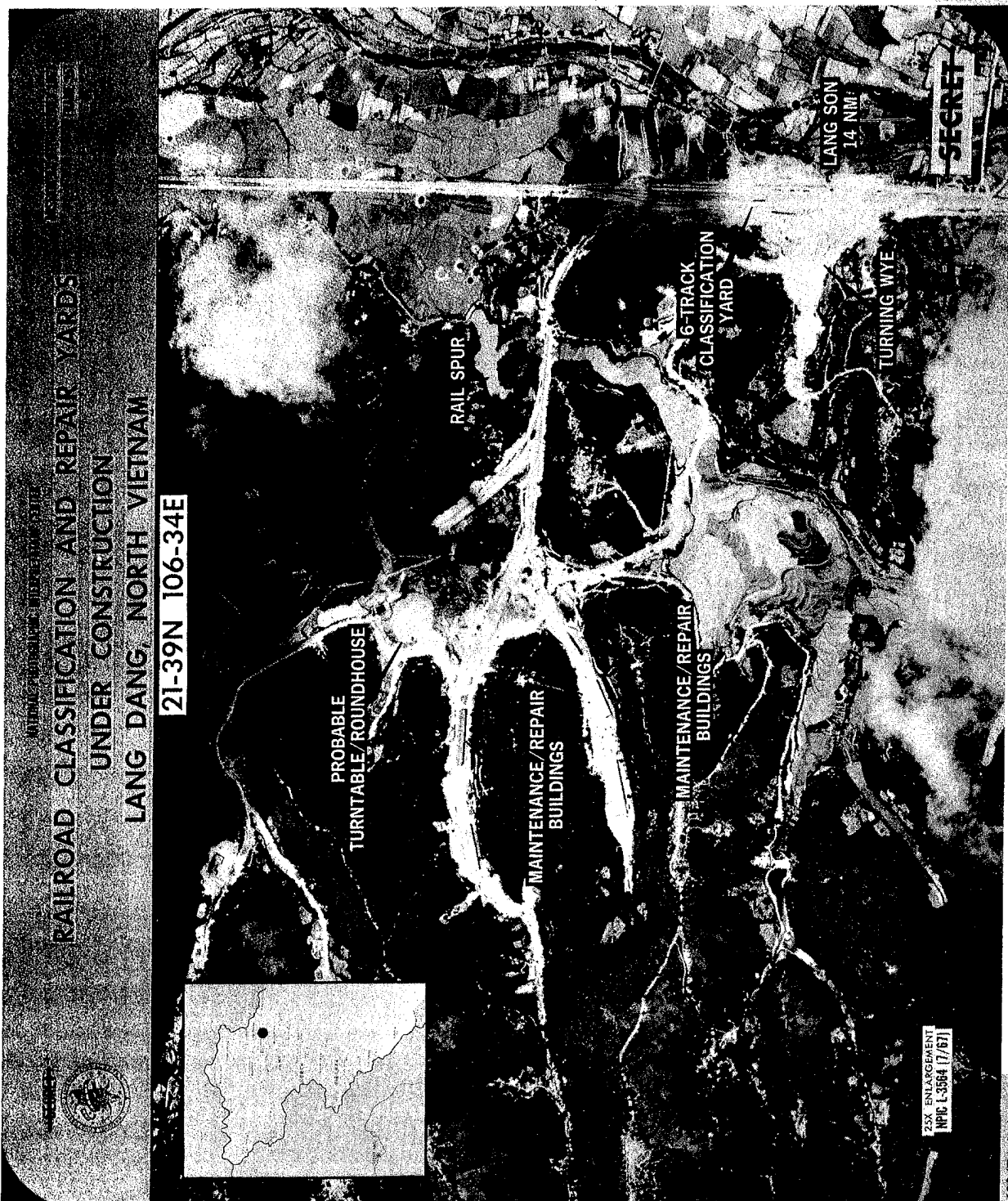
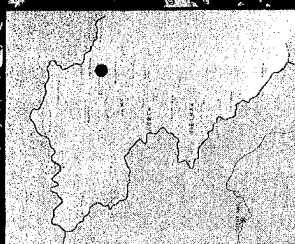


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Figure 13

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**BLACK SHIELD Reconnaissance Missions
16 August - 31 December 1967**

DST-BS/BYE/68-1
31 January 1968

APPROVED FOR RELEASE
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Directorate of Science and Technology*

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PREFACE

This report is the second in a series of resumes of the BLACK SHIELD reconnaissance program flown over North Vietnam. This second resume spans the period from 16 August to 31 December 1967.

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**BLACK SHIELD Reconnaissance Missions
16 August - 31 December 1967**

SUMMARY

Twenty-six BLACK SHIELD high-altitude reconnaissance missions were alerted during the period from 16 August to 31 December 1967. Fifteen of the 26 missions were flown, two of which were fired at by enemy SAM units. Eleven missions were cancelled, mainly due to weather conditions. (Appendix I lists these missions and related events.)

Through 31 December 1967, BLACK SHIELD coverage showed no evidence of surface-to-surface missiles, equipment, or facilities. The coverage continued to be of special value for investigating reports of missile deployment derived from other sources.

The BLACK SHIELD program has obtained good baseline coverage. There now exists clear, interpretable photography of all of North Vietnam except for a small area adjacent to the Chinese border in Northeast North Vietnam. BLACK SHIELD photography continues to be invaluable in providing unique order of battle information on fighter aircraft and surface-to-air missiles. A number of missions have provided total coverage of nearly all of the major North Vietnamese airfields. The simultaneous coverage of a large number of SAM sites has given US theater forces a quick, comprehensive listing of the occupied SA-2 sites. It has also significantly supplemented communications intelligence in determining the actual number of SAM battalions in North Vietnam and has aided in predicting with some degree of certainty the SA-2 occupancy status for tomorrow's strike operation. As an example, back-to-back missions BX6739 and BX6740, flown 15 and 16 December, 1967, photographed 221 of North Vietnam's 226 useable SA-2 sites, including ² six new sites. ¹⁹ Twenty of these SA-2 sites were occupied, including ⁷ five of the six new sites. (Appendix II provides a listing of the COMIREX targets photographed.)

The program continues to contribute substantially to bomb damage assessment of point targets and of the interdiction effort directed against North Vietnam's

road, rail, and water transportation systems. BLACK SHIELD missions have identified new targets for US air strikes and have also provided valuable information [redacted]

[redacted]. In addition, BLACK SHIELD missions BX6737 and BX6738 were flown over the border areas of Cambodia, Laos, and South Vietnam to provide information on the North Vietnamese infiltration and supply routes and on the major North Vietnamese/Viet Cong troop deployment areas.

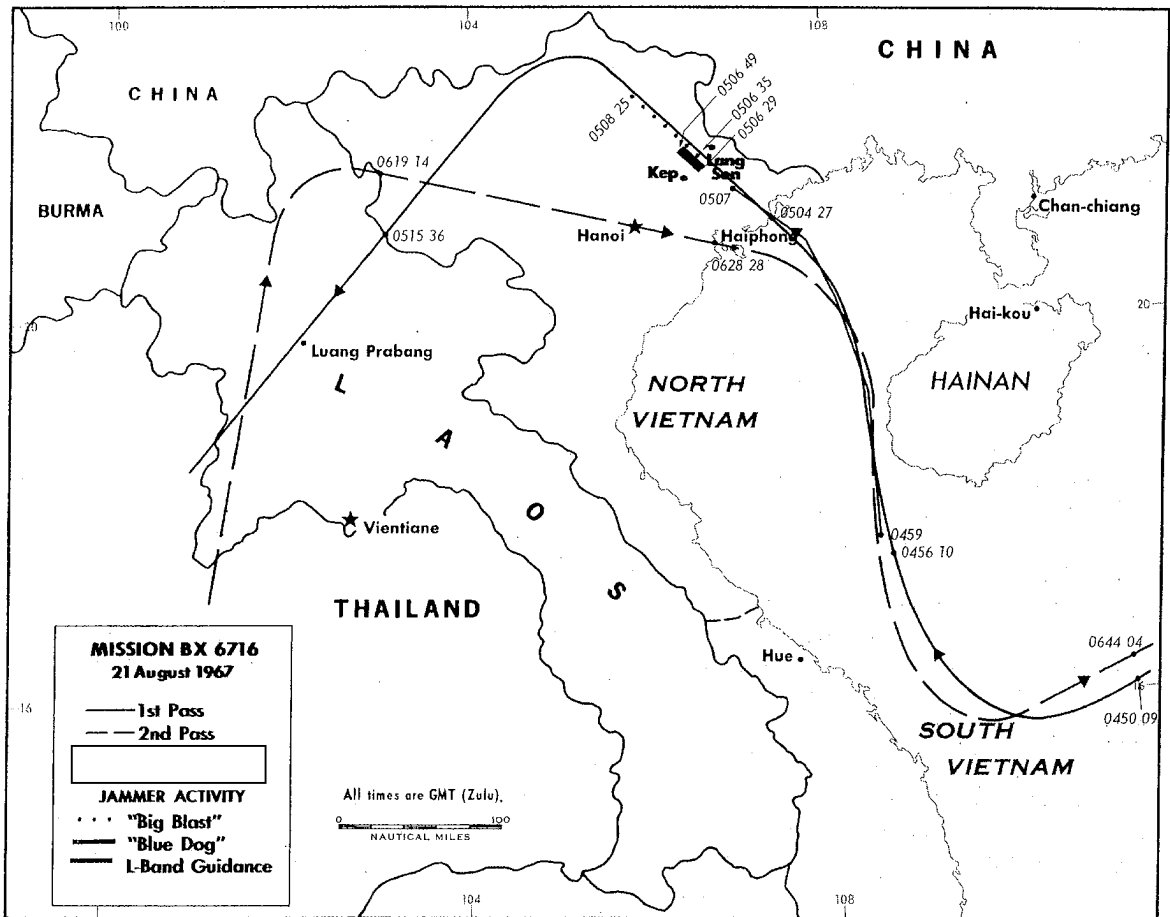
All of the North Vietnamese missions as well as Cambodian BLACK SHIELD mission BX6737 (which extended up the North Vietnamese panhandle) [redacted] [redacted] North Vietnamese air surveillance facilities. North Vietnamese air defense reaction to the vehicle was first noted in [redacted] [redacted] during mission BX6723 (17 September). Subsequently, during mission BX6727 (6 October), air surveillance tracking of the vehicle by North Vietnamese facilities was also confirmed. BLACK SHIELD defensive mechanisms were activated on missions BX6716, BX6725, BX6732, and BX6734. One surface-to-air missile was launched at the vehicle on mission BX6732. Nine to eleven SAMs were fired at BLACK SHIELD mission BX6734. A change in the North Vietnamese SAM launch tactics was observed on missions BX6732 and BX6734, when for the first time missile firings occurred with the Fan Song guidance radar in low PRF (pulse repetition frequency) in an attempt to cope with a Mach-3 target; use of the low-PRF mode permits an earlier missile launch against very fast targets. [redacted]

North Vietnam air defense facilities were forewarned of the 6 October and 15 October missions (BX6727 and BX6728), apparently as a result of intercepting transmissions from the South China Sea refueling area. A more secure communications posture has since been employed, and no additional forewarning messages have been noted.

MISSION ANALYSIS

BX6716

BX6716 was a double-pass, high-altitude reconnaissance mission flown over North Vietnam on 21 August 1967. The BLACK SHIELD vehicle entered and exited North Vietnam on its first pass at 0504:27Z and 0515:36Z and on its second pass at 0619:14Z and 0628:28Z. Figure 1 shows the flight route and associated events.



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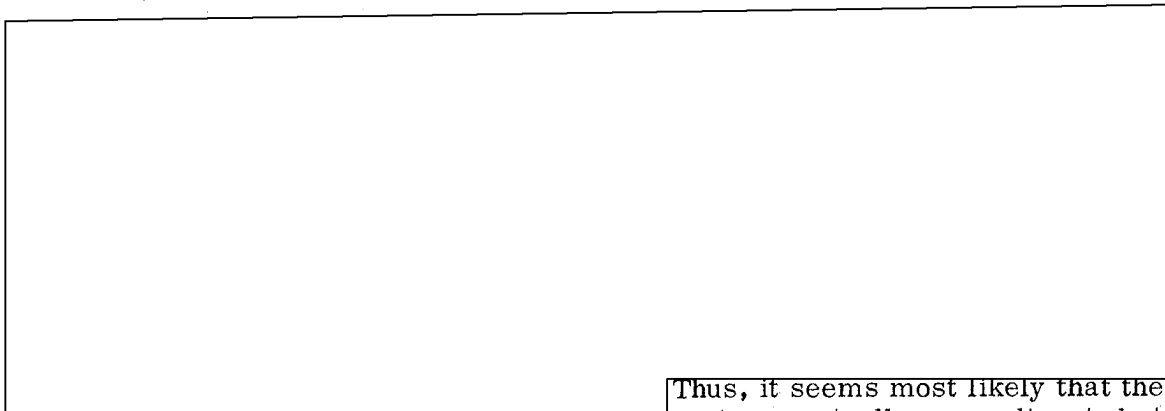
Figure 1

Mission photography did not give any evidence of offensive surface-to-surface missile (SSM) equipment or facilities. Hanoi was covered in good clear photography; however, the ability to interpret photography of Haiphong and some other areas was limited by some clouds and haze over North Vietnam [redacted]. The mission aircraft photographed ¹³⁰ 156 COMIREX targets plus five additional bonus targets. Of these, 108 were SA-2 sites, including one previously unidentified site. Fourteen of the SA-2 sites photographed were occupied.



There was no indication of a hostile weapon reaction directed against the mission vehicle; however, on-board warning/defensive systems were activated during the first pass of the overflight at 0506:34Z. (See figure 1.) Activity indicative of a missile launch and subsequent guidance was noted on the following systems:

- a) System 6, an on-board Elint collection device,
- b) Blue Dog, an L-band guidance jammer,
- c) Big Blast, an S- and C-band noise jammer, and
- d) the missile launch indicator lights.



[redacted] Thus, it seems most likely that the radar/missiles that activated the on-board systems actually were directed at DOD strike aircraft.

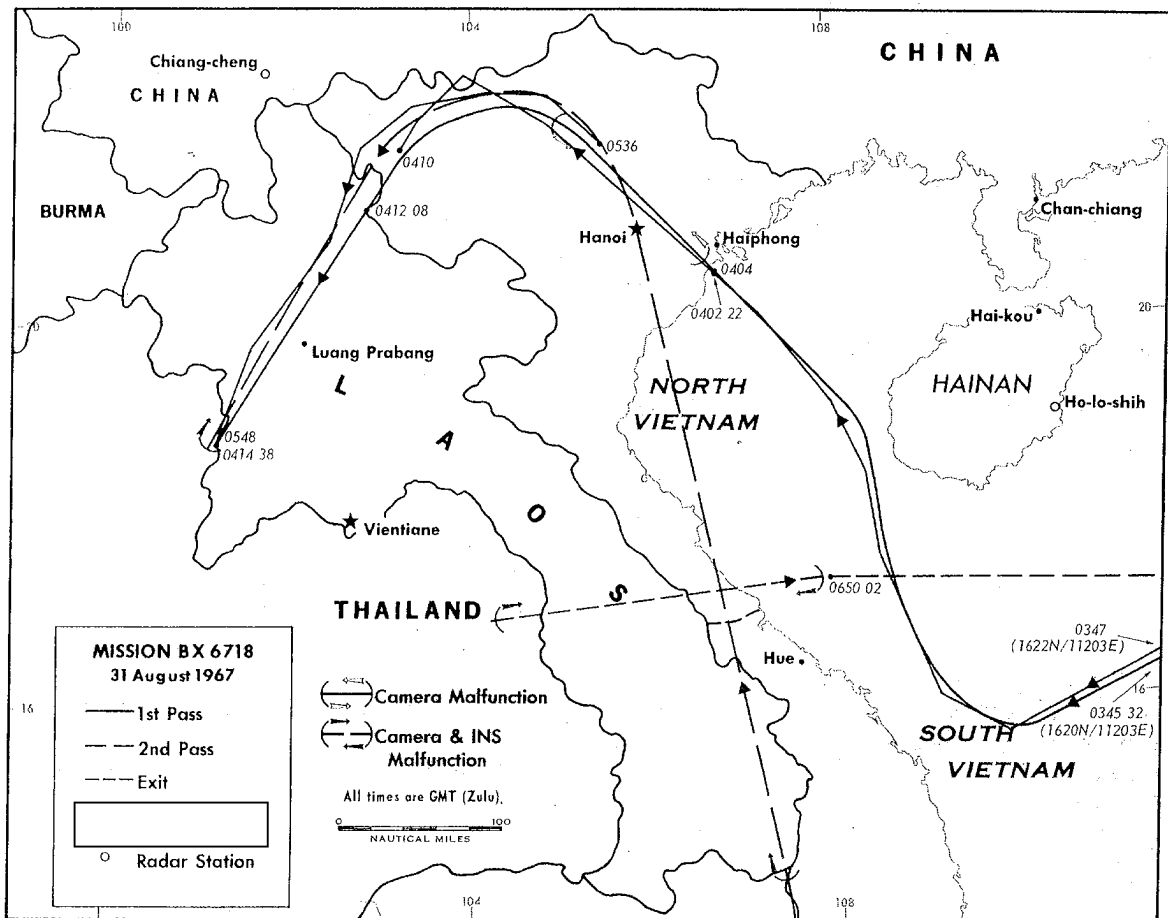
No on-board systems were activated while over North Vietnam during the second pass. Air surveillance tracking (see figure 1) was carried out [redacted]

[redacted] The tracking of the mission vehicle was limited, probably because of the heavy DOD strike/jamming operations being conducted during

the overflight period. Five EB-66B, two EB-66C, and one EA1F aircraft were actively engaged in jamming. Overall signal density was also heavy.

BX6718

BX6718 was a double-pass reconnaissance mission flown over North Vietnam on 31 August 1967. The BLACKSHIELD vehicle entered North Vietnam on its first pass at 0402:22Z and exited on its final pass at 0645:46Z. Figure 2 indicates the flight route and related events.



BLACK SHIELD photography gave no evidence of SSM equipment or facilities. Camera malfunctions occurred on both the first and second passes, as indicated in figure 2. A malfunction in the inertial navigation system (INS) also occurred on the second pass. As a result, only 13 COMIREX targets were photographed. Three of these targets were unoccupied SA-2 sites.

There was no indication of a weapons reaction to the mission vehicle.

However, none of these sites appeared to be tracking the BLACKSHIELD vehicle, and no on-board defensive systems were activated as a result of these signals.



Strike/jamming activity by US aircraft was very light during the overflight period, with one EB-66C and one EB-66B operating in the vicinity from 0402Z to 0505Z.

BX6722

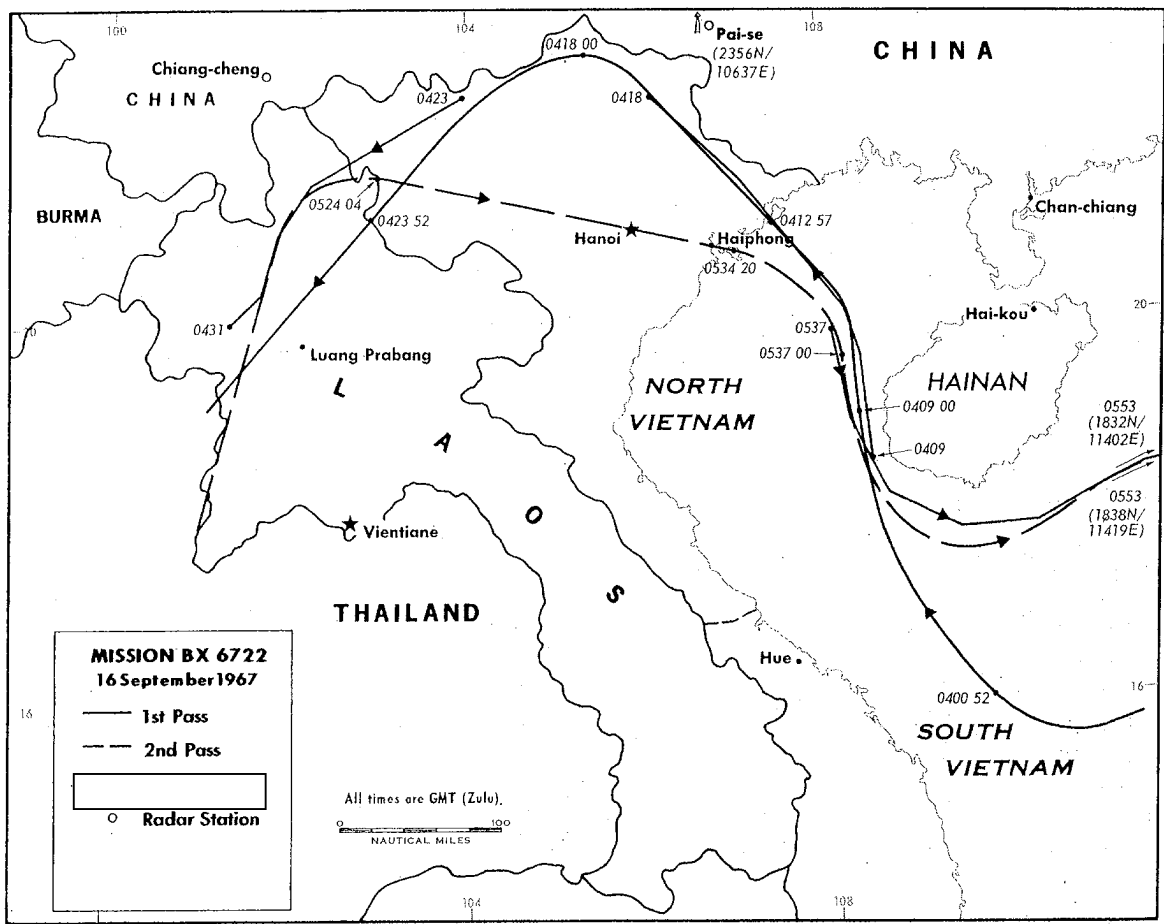
BX6722 was a double-pass, high-altitude reconnaissance mission flown over North Vietnam on 16 September 1967. The BLACK SHIELD vehicle entered and exited North Vietnam on its first pass at 0412:57Z and 0423:52Z and on its second pass at 0524:04Z and 0534:20Z. Figure 3 shows the mission route and associated events.

*The first occurred on BLACK SHIELD mission BX6710 flown on 20 July 1967, as noted in BYE-44232/67.

The weather in the target area was much worse than anticipated, with most of the target area under heavy cloud cover. The mission aircraft photographed 45 COMIREX targets in the North Vietnam/China area. Seventeen of these targets were Vietnamese SAM sites, four of which were occupied. Photography gave no evidence of SSM equipment or facilities.

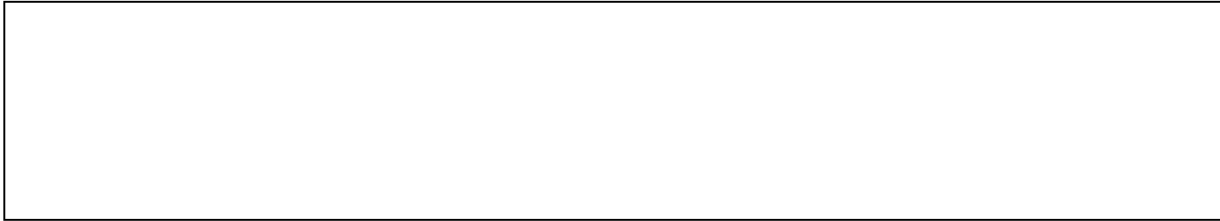
60
22

There was no indication of a hostile weapons reaction. [redacted] but these signals did not appear to be tracking the mission aircraft, and no defensive system was activated by these signals.



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Figure 3



One EB-66B and one EB-66C active ECM platforms were in operation over the Gulf of Tonkin from 0254Z to 0502Z.

BX6723

BLACK SHIELD mission BX6723 was a double-pass, high-altitude reconnaissance mission flown over North Vietnam on 17 September 1967. The BLACK SHIELD vehicle entered and exited North Vietnam on its first pass at 0353:41Z and 0404:08Z and on its second pass at 0511:57Z and 0520:11Z. Figure 4 depicts the mission flight route and significant events.

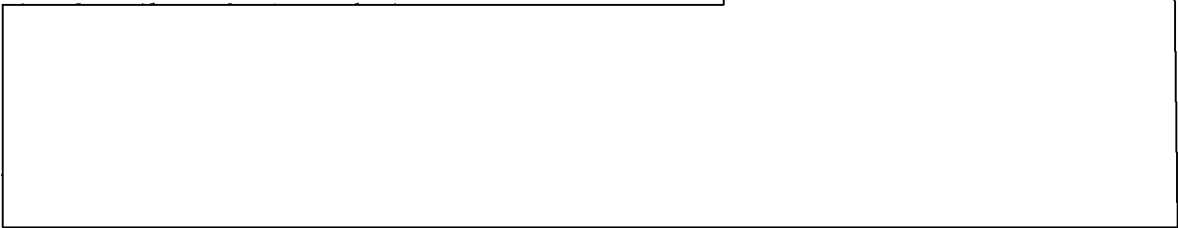
Hanoi, Haiphong and [redacted] were covered in clear photography; only about 10 percent of the target area was cloud covered. Mission photography gave no evidence of SSM facilities or equipment. [redacted]



[redacted] The BLACK SHIELD vehicle photographed over 200 COMIREX targets of North Vietnam [redacted] Approximately 150 of these were North Vietnamese SA-2 sites, including four newly identified sites. Nineteen of the SA-2 sites photographed were occupied.

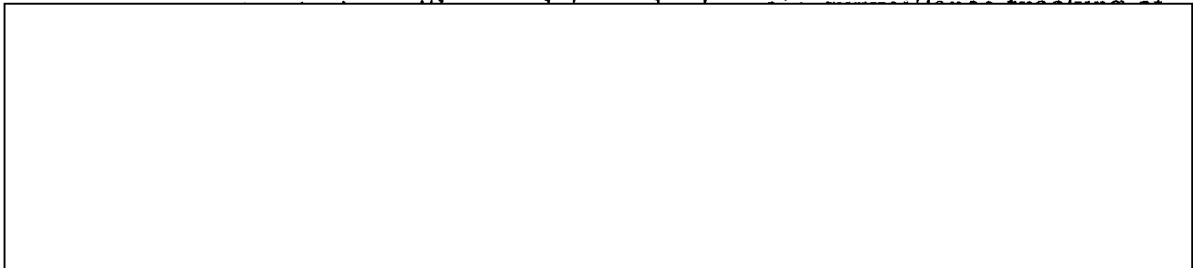
175
124

There was no indication of a hostile weapons reaction; however, North Vietnamese SAM communications did reveal a hostile intent. At 0352Z a SAM site (possibly located at 21°05'N, 106°19'E) was instructed to go to a "condition one" by his regimental controller. ("Condition one" in Soviet/Vietnamese terminology defines the highest readiness state of a SAM site.) [redacted]



[redacted] none of which appeared to be emanating from sites tracking the BLACK SHIELD vehicle; no

defensive system was activated as a result of these signals.



There was no indication of any DOD strike/jamming activity being conducted during the overflight period.

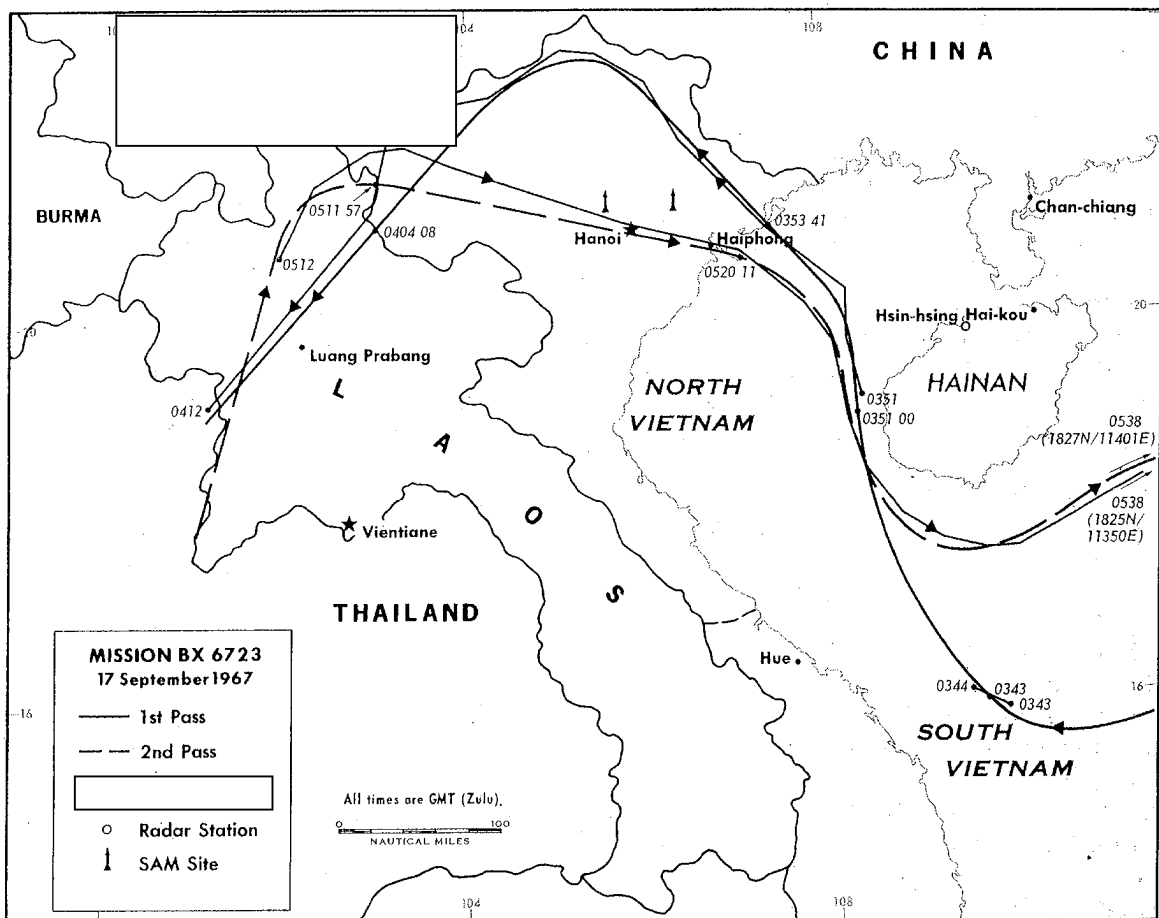


Figure 4

BX6725

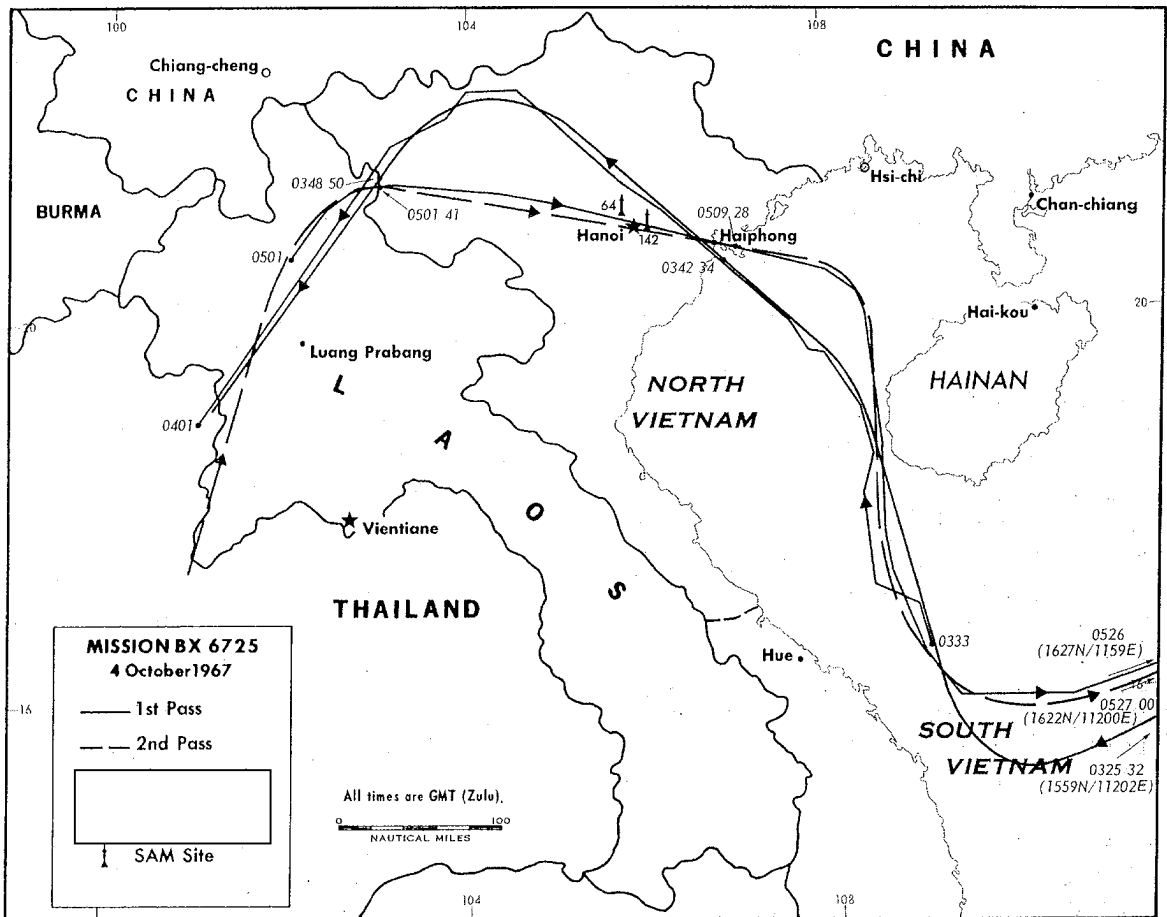
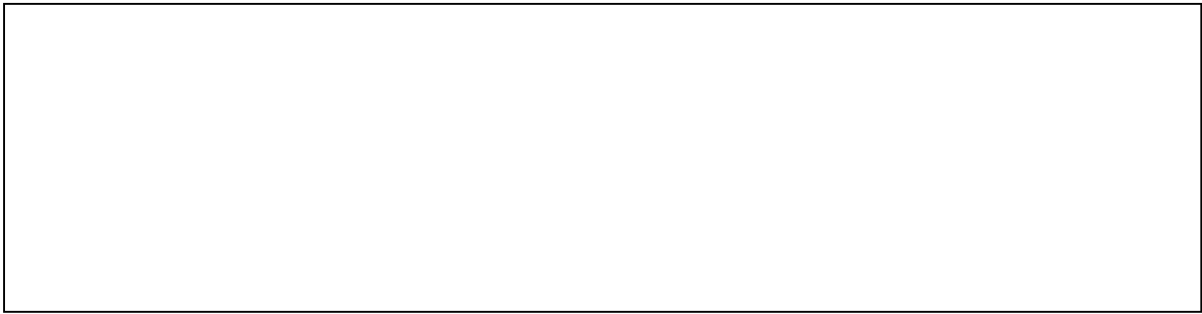
BX6725 was a high-altitude, double-pass reconnaissance mission flown over North Vietnam on 4 October 1967. The mission aircraft entered and exited North Vietnam on its first pass at 0342:34Z and 0348:50Z and on its second pass at 0501:41Z and 0509:28Z. It intercepted two Fan Song signals on the first pass, which activated the on-board defensive systems, but there was no indication of a missile launch. No threat signals were intercepted during the second pass. Figure 5 indicates the mission route and other significant events.

BLACK SHIELD mission BX6725 obtained clear photography of over 40 percent of the country, including the Hanoi, Haiphong, and Thai Nguyen areas [redacted]

[redacted]

[redacted] Mission photography gave no evidence of SSM deployment. The BLACK SHIELD vehicle photographed 187 COMIREX and 16 bonus targets. Of these, 154 were SA-2 sites, including 18 that were occupied. 147

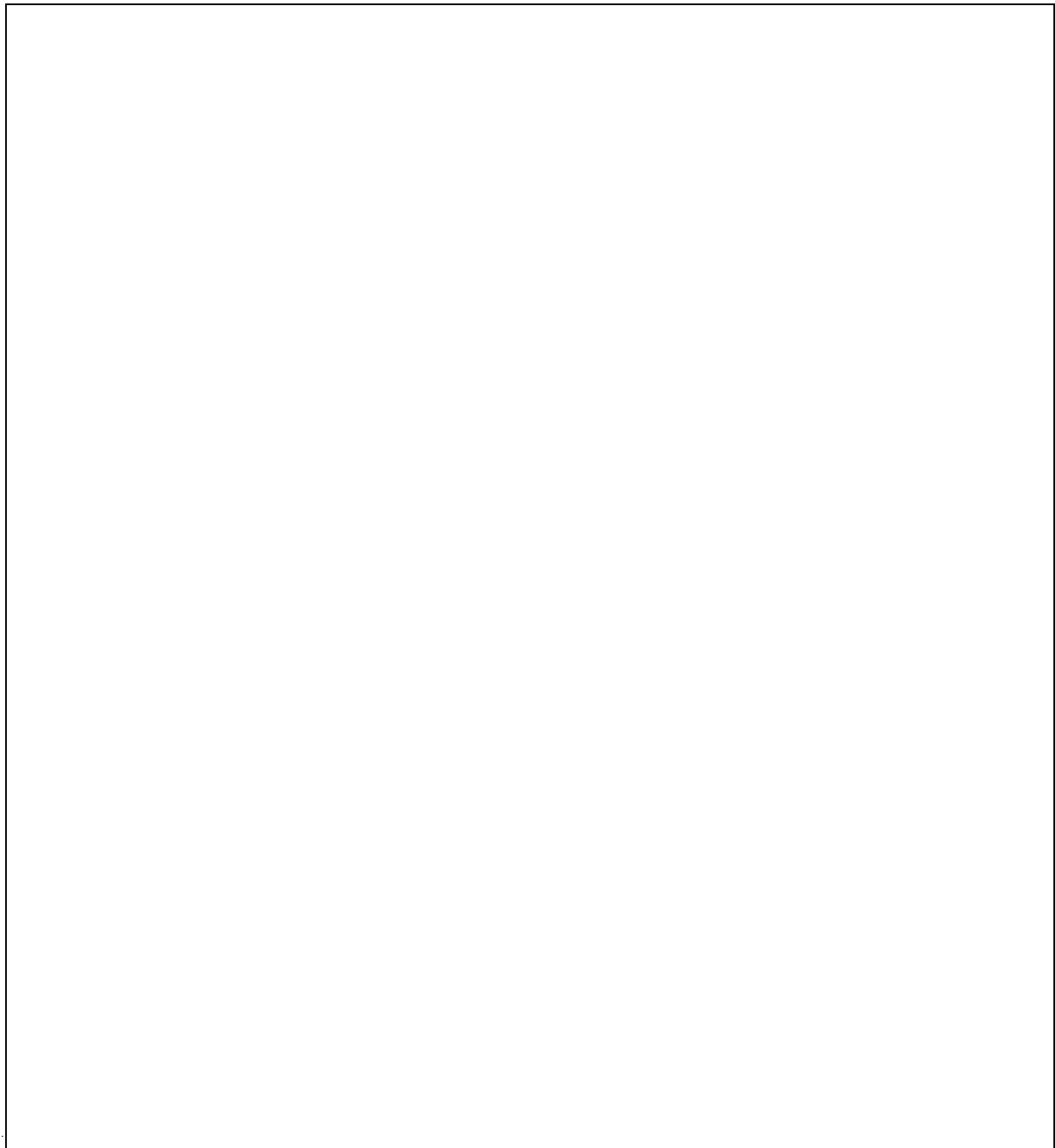
[redacted]



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Figure 5



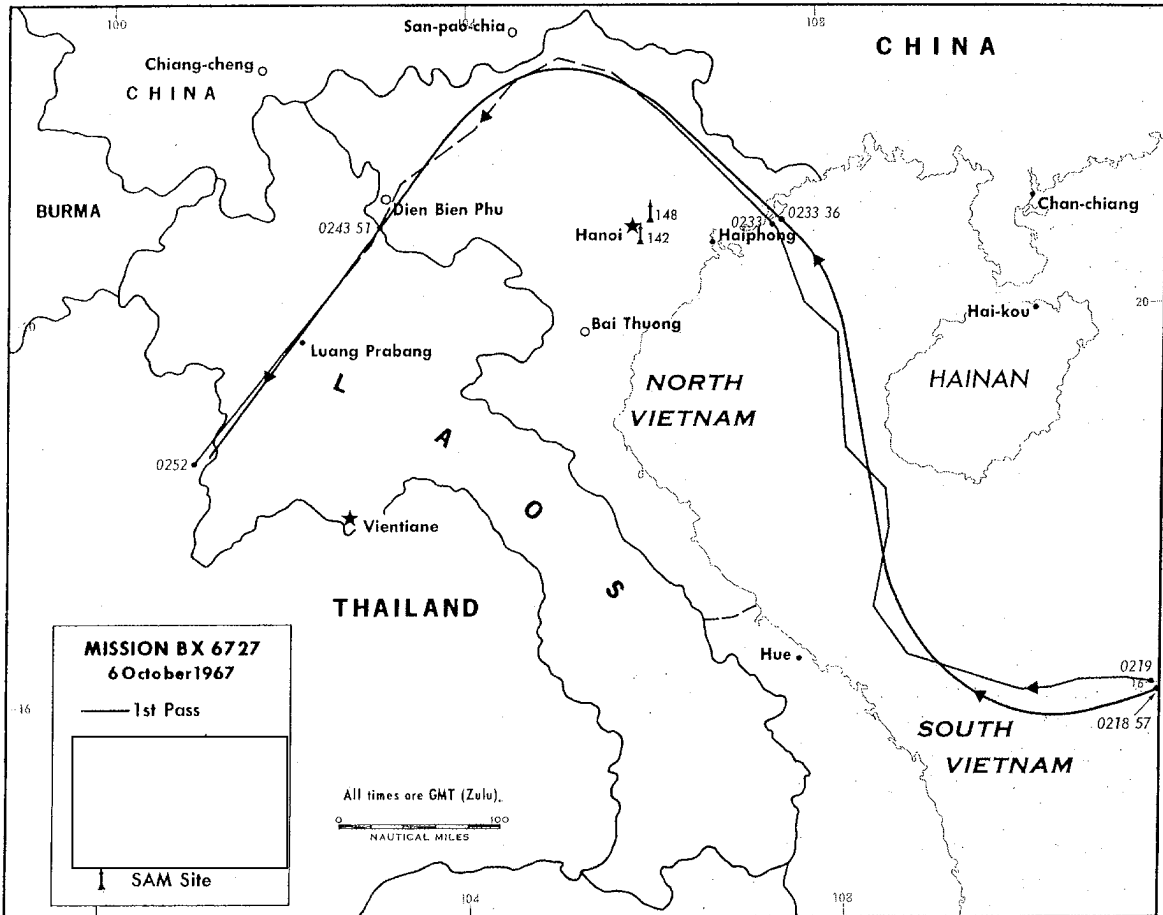
It should be noted that seven DOD strike/reconnaissance aircraft were active during the SAM activity of the first pass, while 57 strike, four ECM, Iron Hand aircraft were active during the tracked but uneventful second pass.

BX6727

BLACK SHIELD mission BX6727 was a single-pass reconnaissance mission flown over North Vietnam on 6 October 1967. The mission vehicle entered North Vietnam at 0233:36Z and exited at 0234:51Z. Figure 7 shows the route and associated events.

Mission photography gave no evidence of SSM facilities or equipment. Overall photography was good although scattered clouds covered approximately 40 percent of the target area. ~~Thirty-six~~ COMIREX targets were photographed by this single-pass mission. Nine of these were SA-2 sites, but occupancy could not be determined.

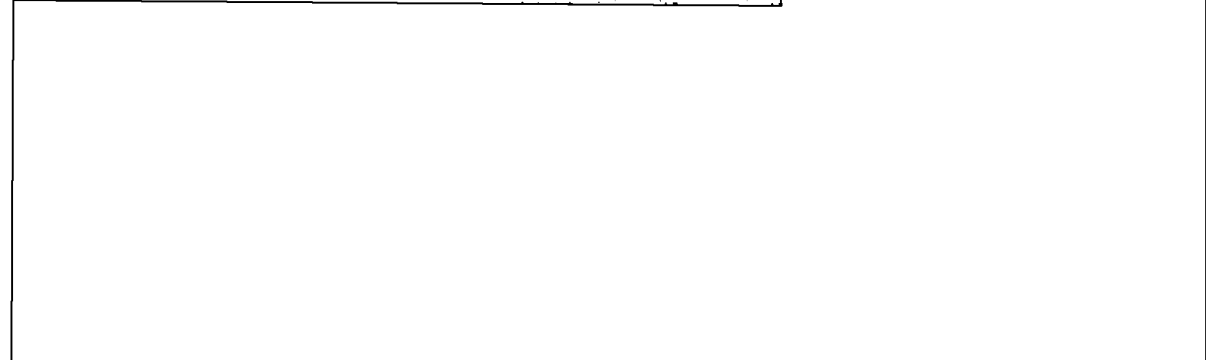
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[redacted] None of these signals appeared to be tracking the vehicle, and no on-board defensive systems were activated as a result of these signals. [redacted]



During the overflight period one EB-66C and one EB-66B jamming platforms were active. Strike activity was very light during this time frame.

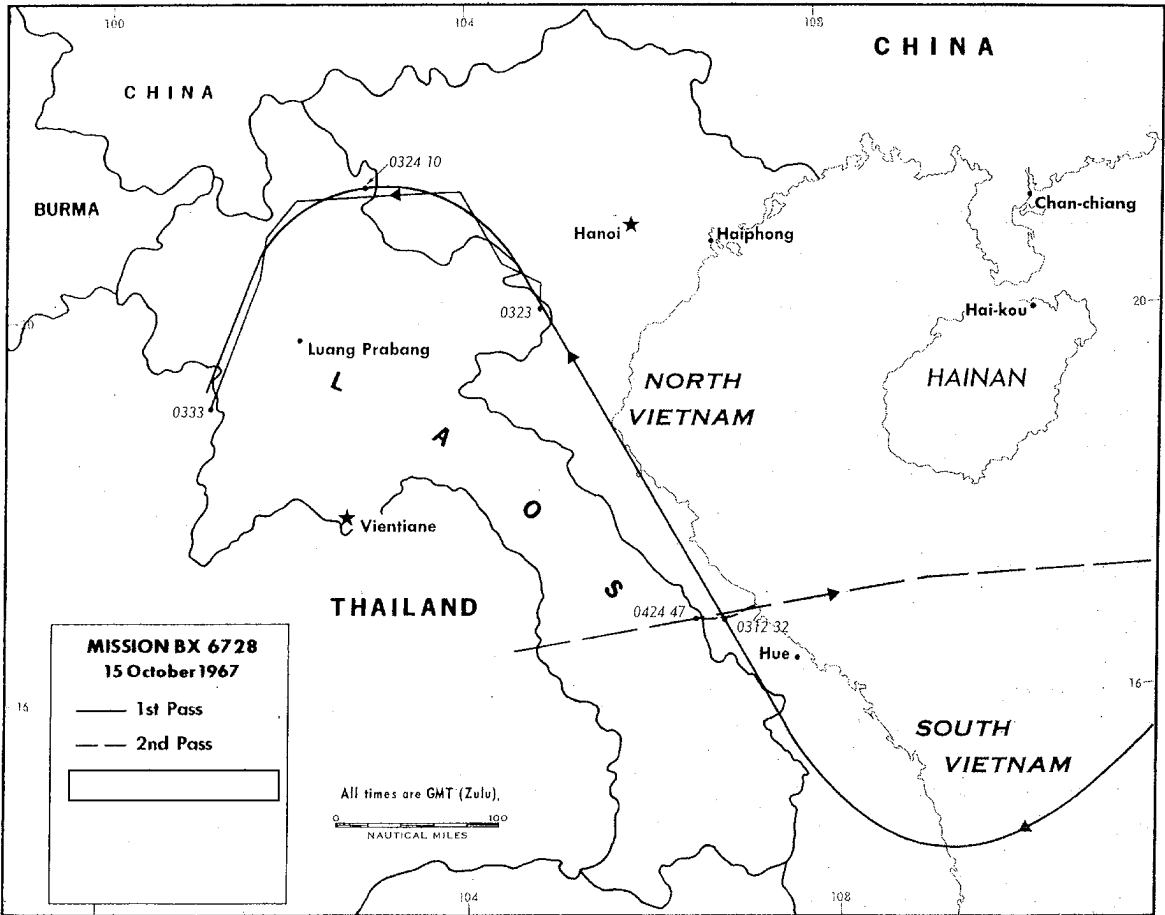
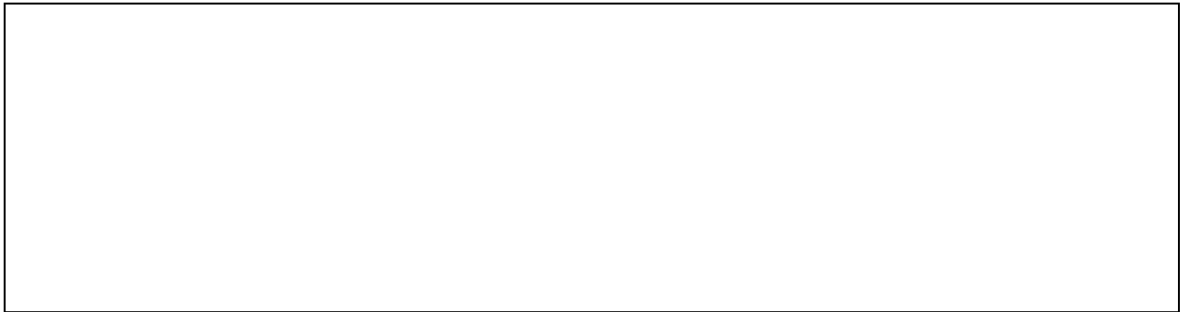
BX6728

BLACK SHIELD mission BX6728 was a double-pass, high-altitude reconnaissance mission flown over North Vietnam on 15 October 1967. The mission vehicle entered and exited North Vietnam on its first pass at 0312:32Z and 0324:10Z and on its second pass at 0424:47Z and 0425:55Z. Figure 8 is a plot of the mission flight route and other associated events.

Extensive clouds limited clear coverage to about 10 percent of the photographed area. Mission photography gave no evidence of SSM equipment or facilities.

15

BLACK SHIELD photographed 19 COMIREX targets, seven of which were SA-2 sites. One new SA-2 site was identified, but none of the sites photographed was occupied.



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Figure 8

[redacted] The signal did not appear to be emanating from a site tracking the mission vehicle, and no defensive mechanism was activated as a result [redacted]

[redacted]

Available information indicated little or no strike/jamming operations during the overflight period.

BX6729

BX6729 was a double-pass reconnaissance mission flown over North Vietnam on 18 October 1967. The mission vehicle entered and exited North Vietnam on its first pass at 0346:43Z and 0355:56Z and on its second pass at 0506:23Z and 0513:47Z. Figure 9 is a display of the vehicle flight route and air surveillance tracking.

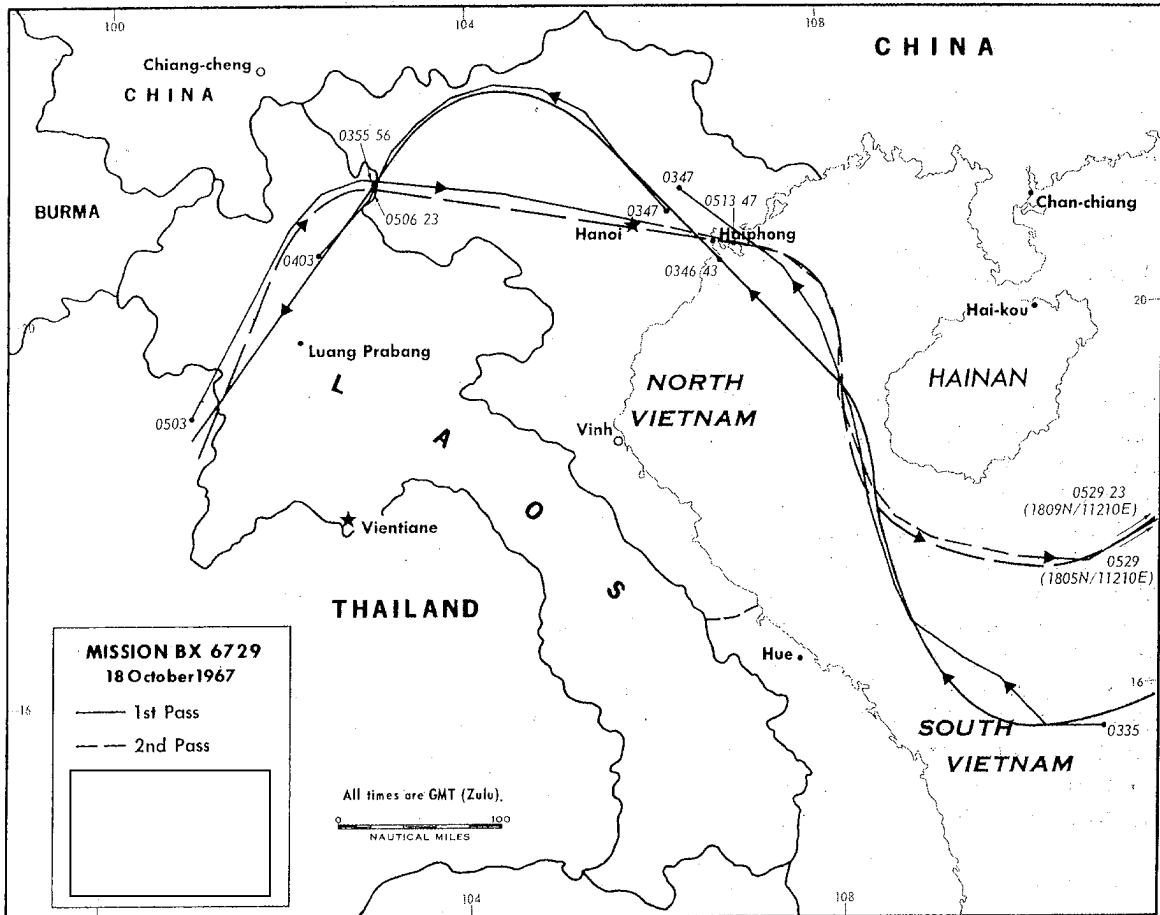
Cloud-free photography was obtained over about 50 percent of the country, including the Hanoi and Haiphong areas. The mission covered most of the surface-to-surface missile search area, but there was no evidence of SSM deployment. Construction activity [redacted] was noted in mission photography. The mission aircraft photographed 193 COMIREX targets, 153 of which were SA-2 sites. Sixteen of these SA-2 sites were occupied, including one newly identified site. Dummy SA-2 missiles were noted occupying one SA-2 site.

[redacted]. This signal was not tracking the aircraft, and no on-board defensive systems were activated during the overflight.

[redacted]



No strike/jamming aircraft were noted in operation during the first pass. Two EB-66 active jamming platforms were in operation during the second pass. Overall signal density was light.



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Figure 9

BX6732

BLACK SHIELD mission BX6732 was a double-pass, high-altitude reconnaissance mission flown over North Vietnam on 28 October 1967. The first pass entered North Vietnam at 0353:25Z and exited at 0406:12Z; the second pass entered at 0503:53Z and exited at 0511:44Z. A missile was fired at the vehicle during the second pass at 0508:36Z. Figure 10 portrays the BLACK SHIELD flight route and associated events.

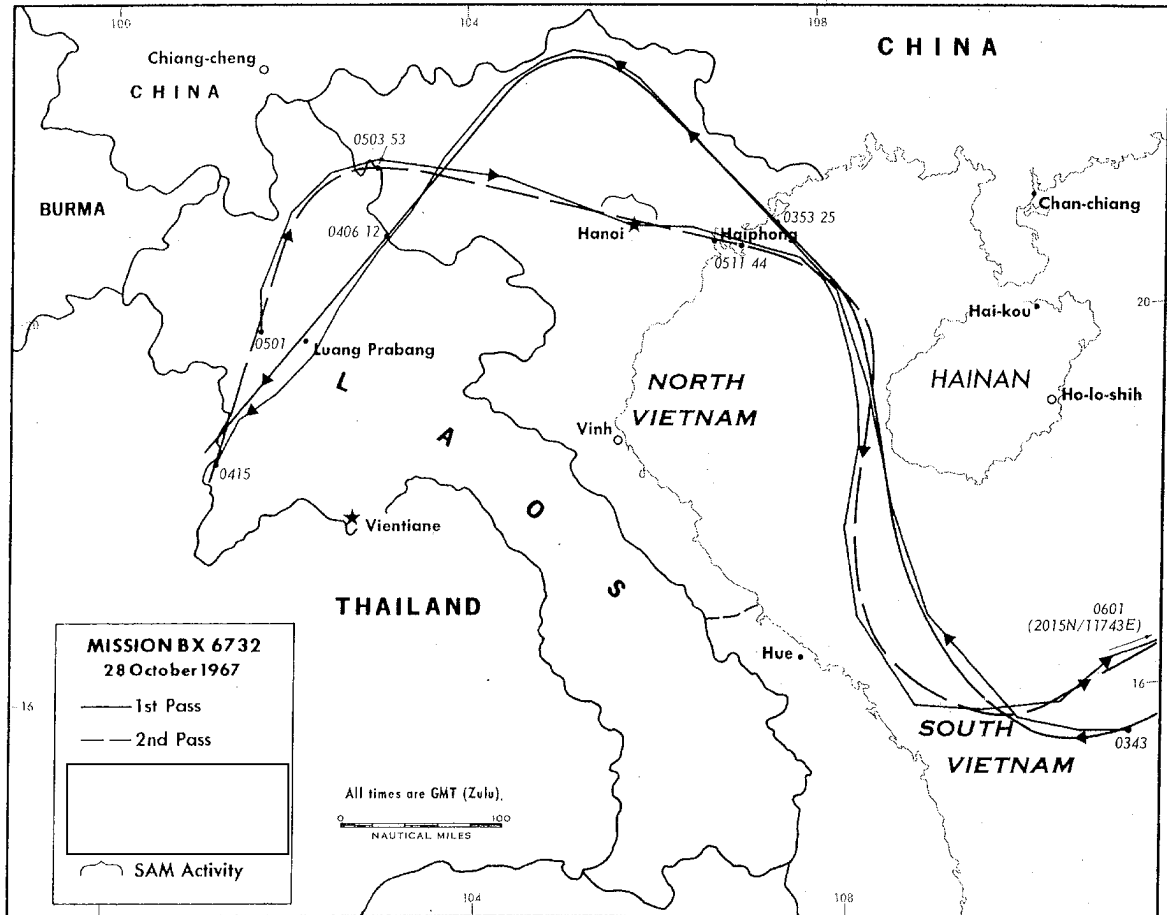
BX6732 photography gave no evidence of SSM deployment. A probable rail-to-road transshipment point was shown under construction near [redacted]. [redacted] BX6732 provided good coverage of all six major airfields in North Vietnam. With the exception of Haiphong/Cat Bi Airfield, all appeared to be serviceable. The mission aircraft photographed 192 167 COMIREX targets and 22 bonus targets. Of these, 120 were North Vietnamese SA-2 sites, 14 of which were occupied. 135

[redacted]
These signals did not appear to be emanating from radars tracking the vehicle; no on-board defensive systems were activated because of these signals.

During the second pass, System 6 recorded three Fan Song signals, two of which were tracking the vehicle. Correlation of all information of this overflight showed that North Vietnamese SAM site VN 133 launched a single, albeit unsuccessful, missile at the mission vehicle. This was the first known missile firing at a BLACK SHIELD vehicle by the North Vietnamese surface-to-air missile air defense system. [redacted]

Figure 12 shows two photographs from this mission: one of missile smoke above site VN 133 and the other of a missile (with missile vapor trail), which

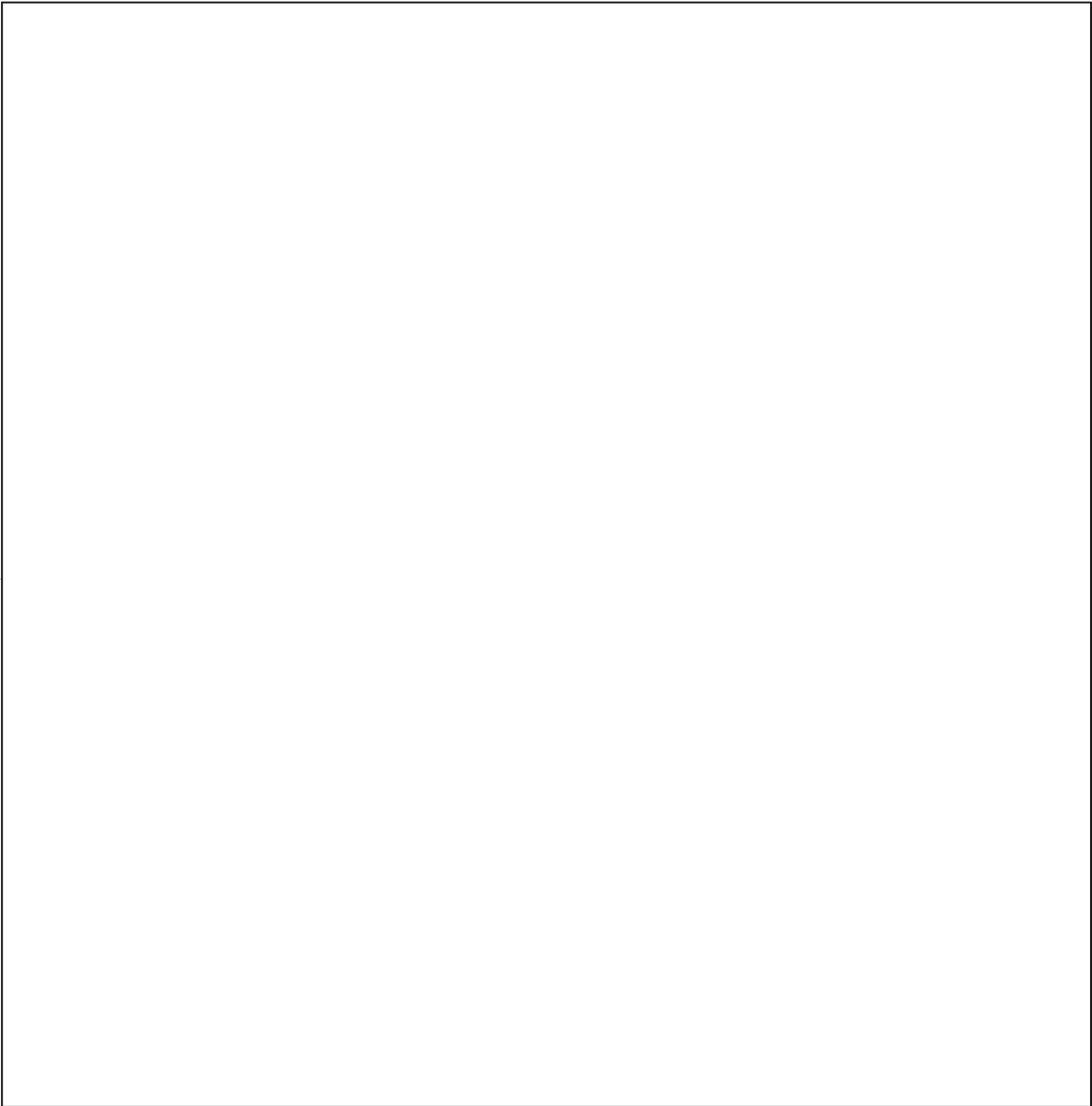
was probably fired by site VN 133 at the BLACK SHIELD vehicle. The second photograph also shows the missile flight path was then down and away from the BLACK SHIELD vehicle flight path.



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Figure 10

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Air surveillance tracking of the vehicle was carried out [redacted] North Vietnamese air defense facilities. [redacted]

DOD strike/jamming reports indicate that 23 aircraft were conducting operations during the first pass overflight. During the missile launch of the second pass, three DOD strike aircraft were conducting operations.

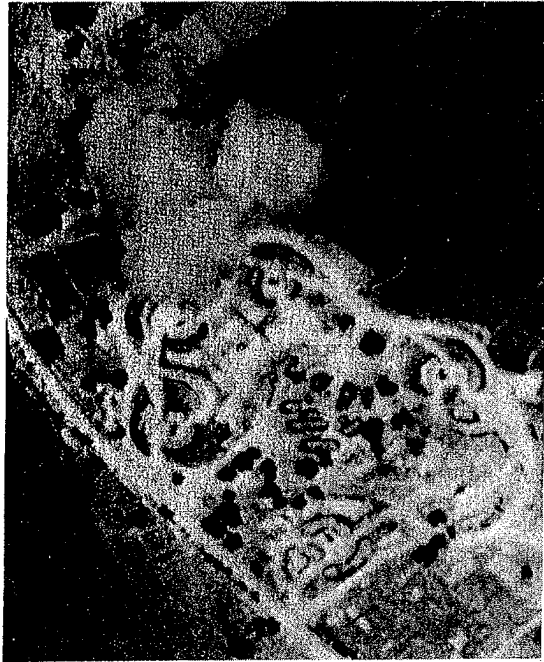


Figure 12a. Missile Smoke Above Site VN 133 . Figure 12b. Missile and Missile Vapor Trail

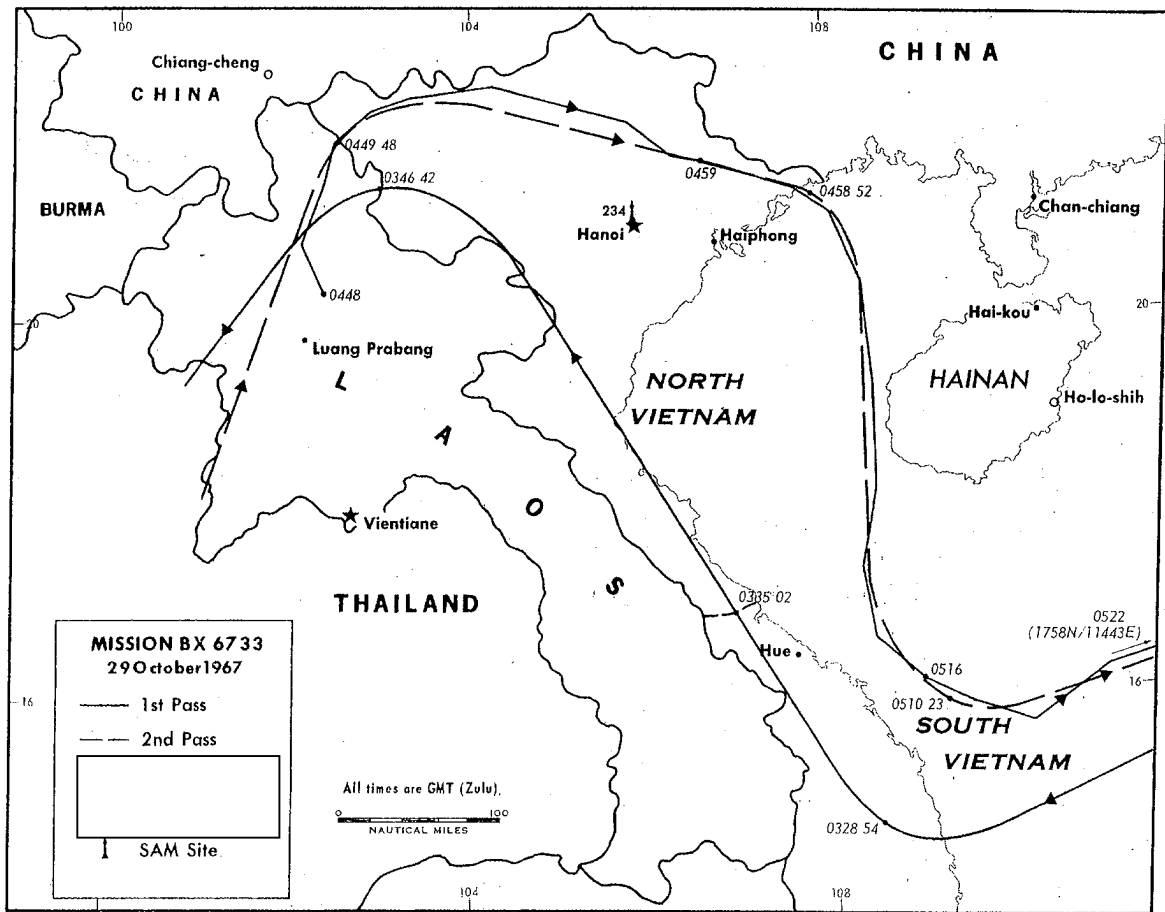
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BX6733

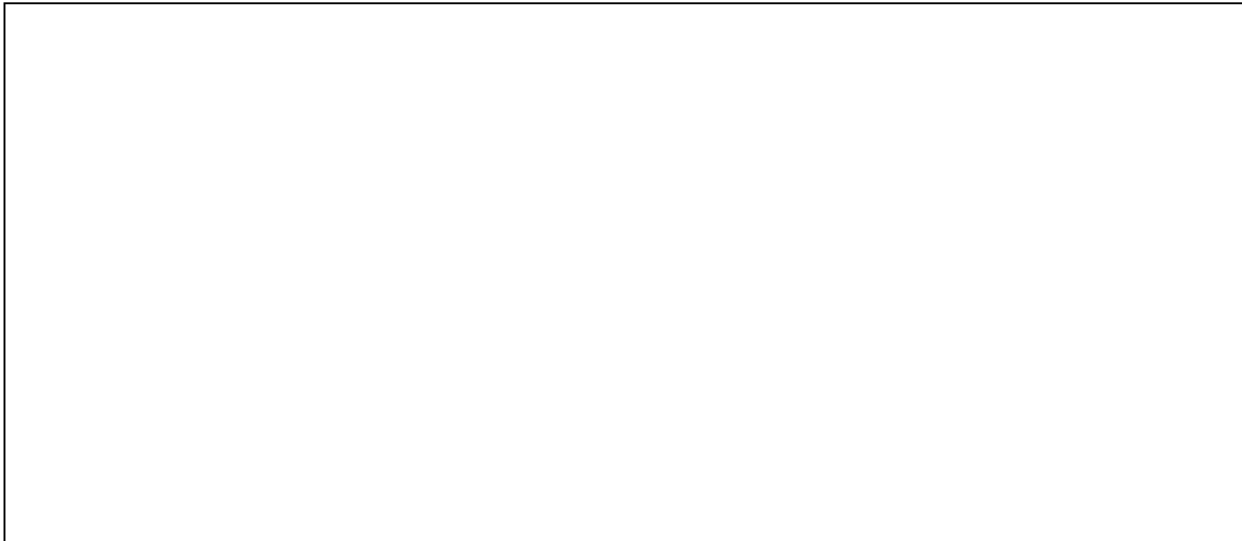
BLACK SHIELD mission BX6733 was a two-pass reconnaissance mission flown over North Vietnam on 29 October 1967. The vehicle entered and exited North Vietnam on its first pass at 0335:02Z and 0346:42Z and on its second pass at 0449:48Z and 0458:52Z. Figure 14 presents the mission flight path and associated events.



Mission photography gave no evidence of SSM equipment or facilities. Continuing construction [redacted] was the first sign of progress since 20 June 1967. The mission aircraft photographed 120/28 COMIREX targets. Of these, 57 were SA-2 sites, 10 of which were occupied. One new unoccupied SA-2 site was identified. /

[redacted]
Vietnam. None of these signals appeared to be tracking the BLACK SHIELD vehicle, and no on-board defensive systems were activated as a result of these signals.

During the first pass, there was no indication of air surveillance tracking by either the North Vietnamese [redacted] Nor were there any reported strike/jamming operations.

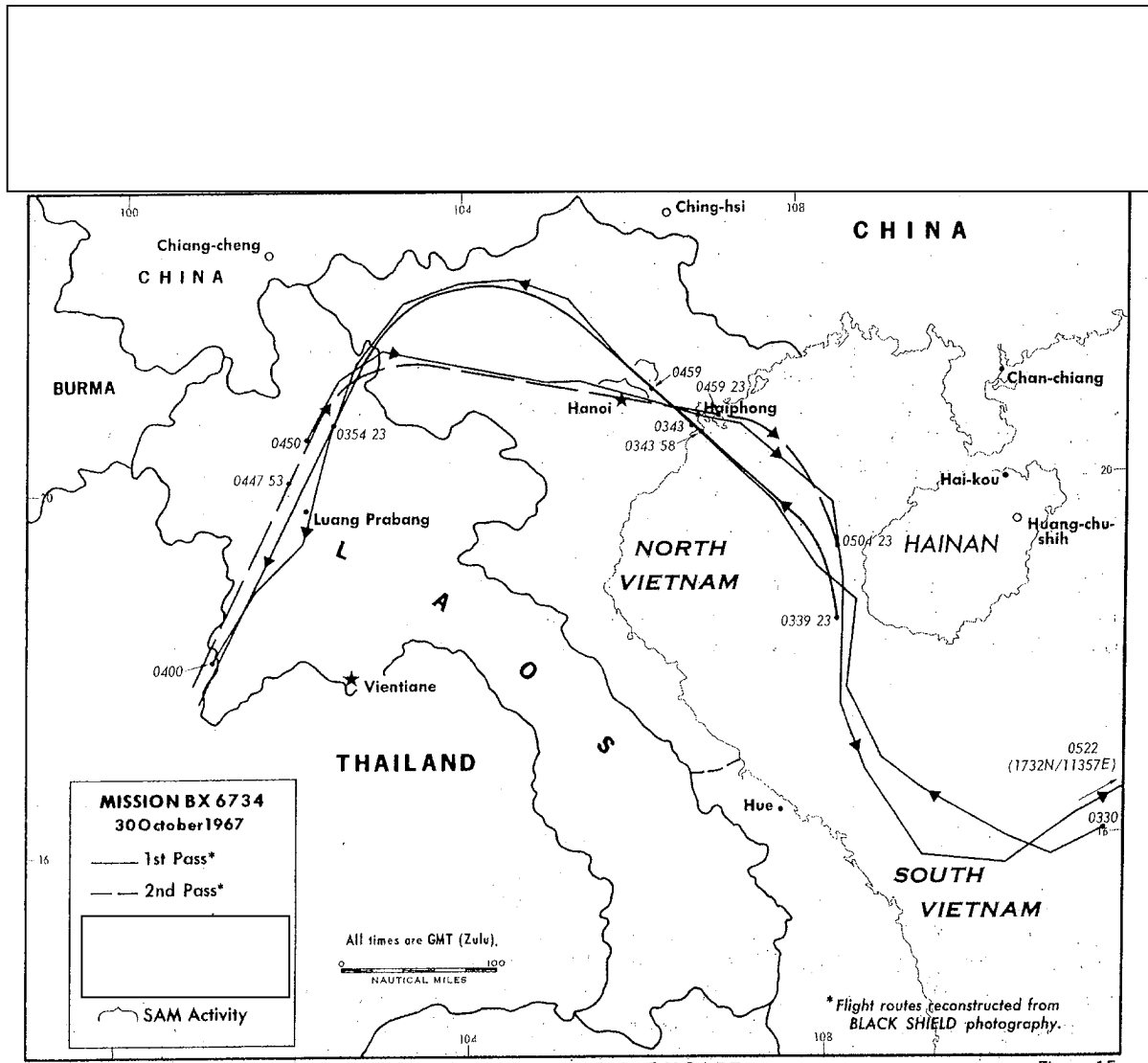


BX6734

Mission BX6734 was a high-altitude, double-pass reconnaissance mission flown over North Vietnam on 30 October 1967. The first pass of the mission vehicle entered North Vietnam at 0343:58Z and exited at approximately 0353:00Z. The second pass was over North Vietnam from approximately 0445:00Z to 0459:23Z. Figure 15 shows the mission aircraft's flight route and associated air surveillance events.

The BLACK SHIELD vehicle photographed 118 COMIREX targets, ⁹⁰ of which were North Vietnamese SA-2 sites. Thirteen of these sites were occupied, including one newly identified site. BLACK SHIELD photography gave no evidence of SSM facilities or deployment.

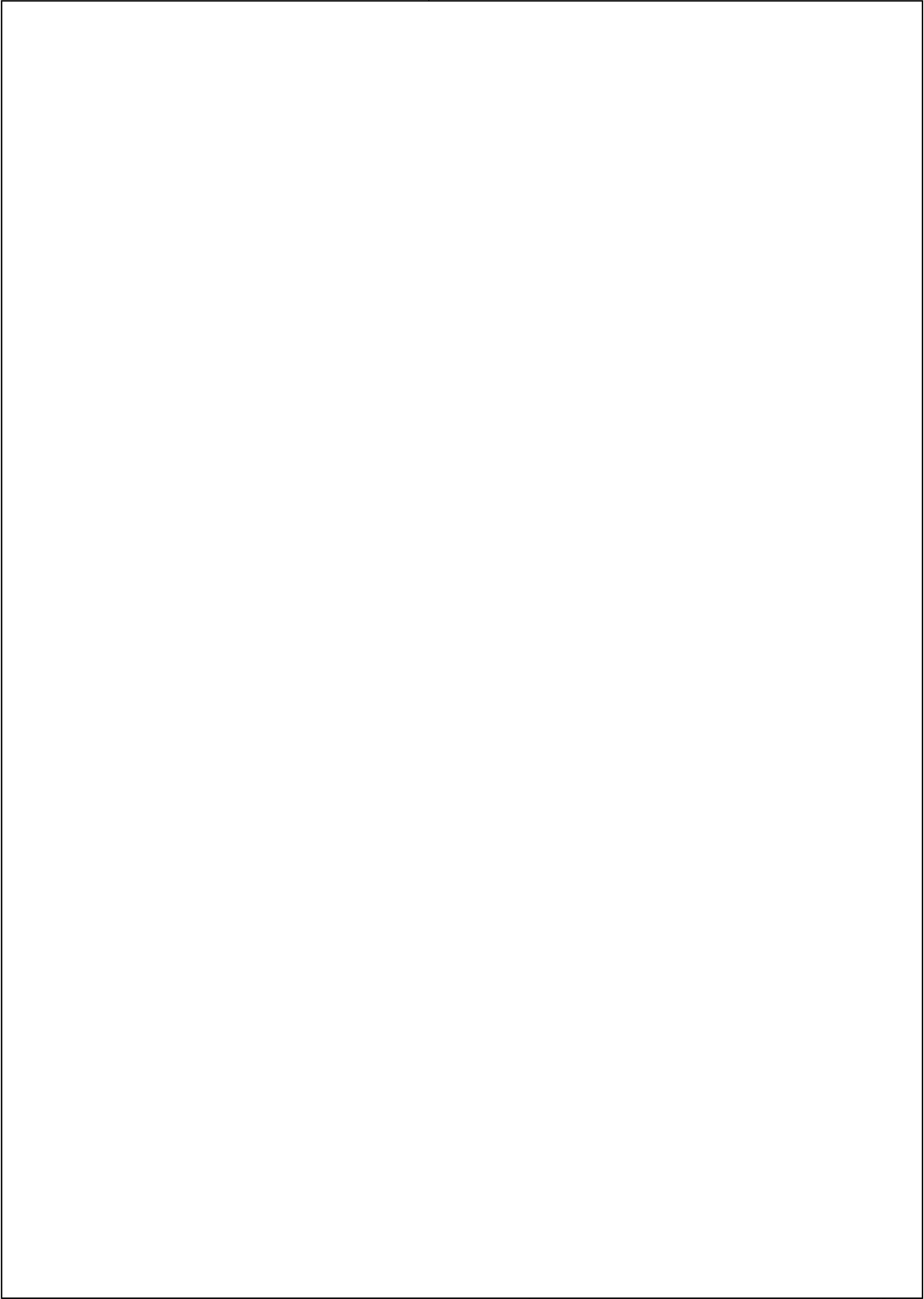
Surface-to-air missile reactions were noted on the first pass from 0340Z to 0402Z and during the second pass from 0420Z to 0501Z. Figure 16 shows the reaction area and related events during this time period.



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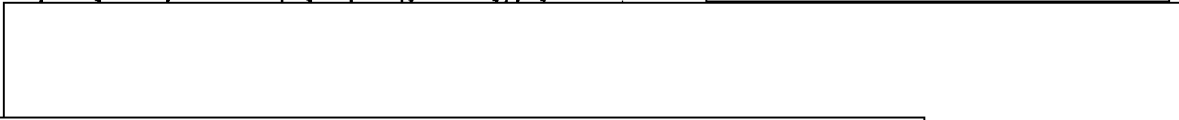
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Figure 15





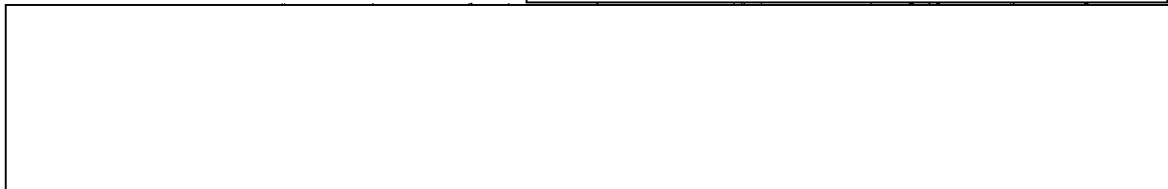
Correlation and analysis of all available data on the second pass shows that at least six SAM sites fired from eight to ten missiles at the BLACK SHIELD vehicle in the 2-minute period from 0456Z to 0458Z. [redacted]



[redacted] BLACK SHIELD photography shows vapor trails of six missiles (see figure 18). The pilot also saw these vapor trails and witnessed three SA-2 detonations.



Postflight inspection of the BLACK SHIELD vehicle revealed that a piece of metal had penetrated the lower right wing fillet area and lodged against the support structure of the wing tank. [redacted]



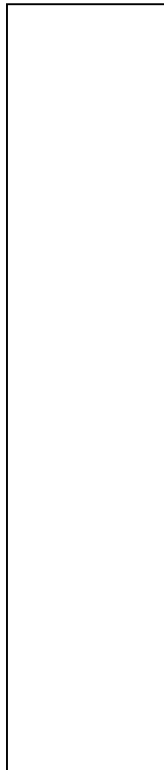
[redacted] North Vietnamese air defense facilities continuously tracked the mission vehicle over North Vietnam and the Gulf of Tonkin.

DOD strike/jamming activity was light during the first pass. In contrast, moderately heavy strike/jamming operations (62 aircraft) were conducted during the second pass. These operations were being conducted in the Haiphong area, however, while the SAM launches occurred near Hanoi.

TABLE 1

Chronology of Events Associated with Mission BX6734

Site No.	Vapor Trail*	SEARCH PARAMETERS		DETECTION PARAMETERS			LAUNCH PARAMETERS			DETONATION PARAMETERS		Remarks					
		Time**	Range (nm)	Azimuth (deg)	Altitude (ft)	Time	Range (nm)	Azimuth (deg)	Altitude (ft)	Range (nm)	Azimuth (deg)		Altitude (ft)				
234	...	0341Z	161	90-180	82,020	0344Z	81	...	...	...	...	...	Aircraft to radar minimum range: 32 nm; no launch.				
142	...	0345Z	81	100-140	above 65,000	0346Z	32.5	120	...	...	...	...	Aircraft to radar minimum range: 32.5 nm; no launch.				
167	...	...	...	...	...	...	...	...	0346Z	36	110	83,000	...	Only possible launch parameters: no indication of launch other than Elint.			
FIRST PASS																	
234	D	0429Z	167	270	82,025	...	...	273	83,000	0455Z	38	268	82,000	22.5	180	...	1 missile, lead angle, jamming on S-band.
244/159	AB, BC, EA	...	...	...	...	...	...	...	...	0455Z	...	...	...	18.9	180	...	2 missiles fired (error great)
159/244	A, B, E	0426Z	...	270	78,740	...	...	280	78,700	0457Z	40.5	275	78,700	19.0	265	78,000	1 missile, lead angle, jamming on S-band.
133	C	0426Z	...	...	...	0457Z	...	270	75,700	0459Z	35.2	270	75,700	20.5	240	82,020	1 missile, lead angle, jamming on S-band.
142	...	...	...	...	...	...	...	...	...	...	...	...	...	10.8	60	...	2 missiles fired late.
19	F	Photography indicated F vapor trail may have been fired from site 19.



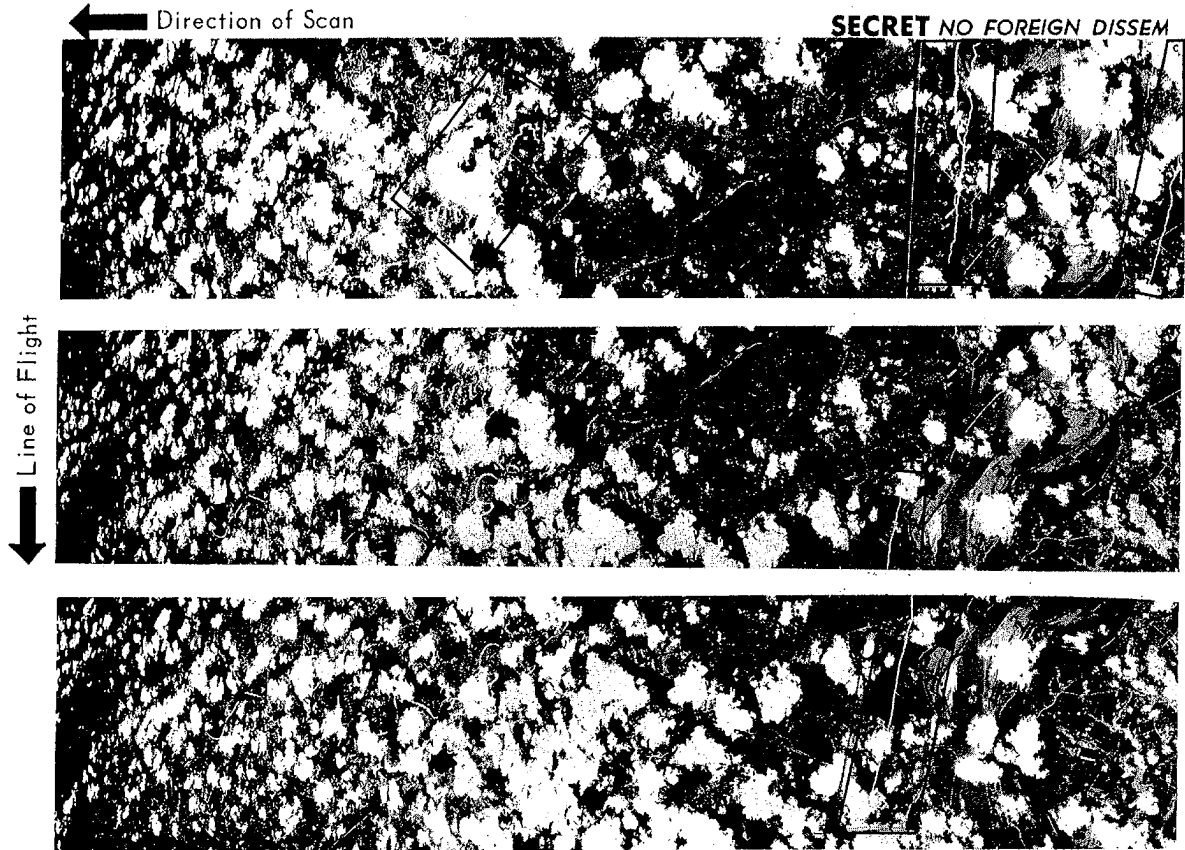



Figure 18a. BLACK SHIELD Photography of Missile Vapor Trails

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Direction of Scan 

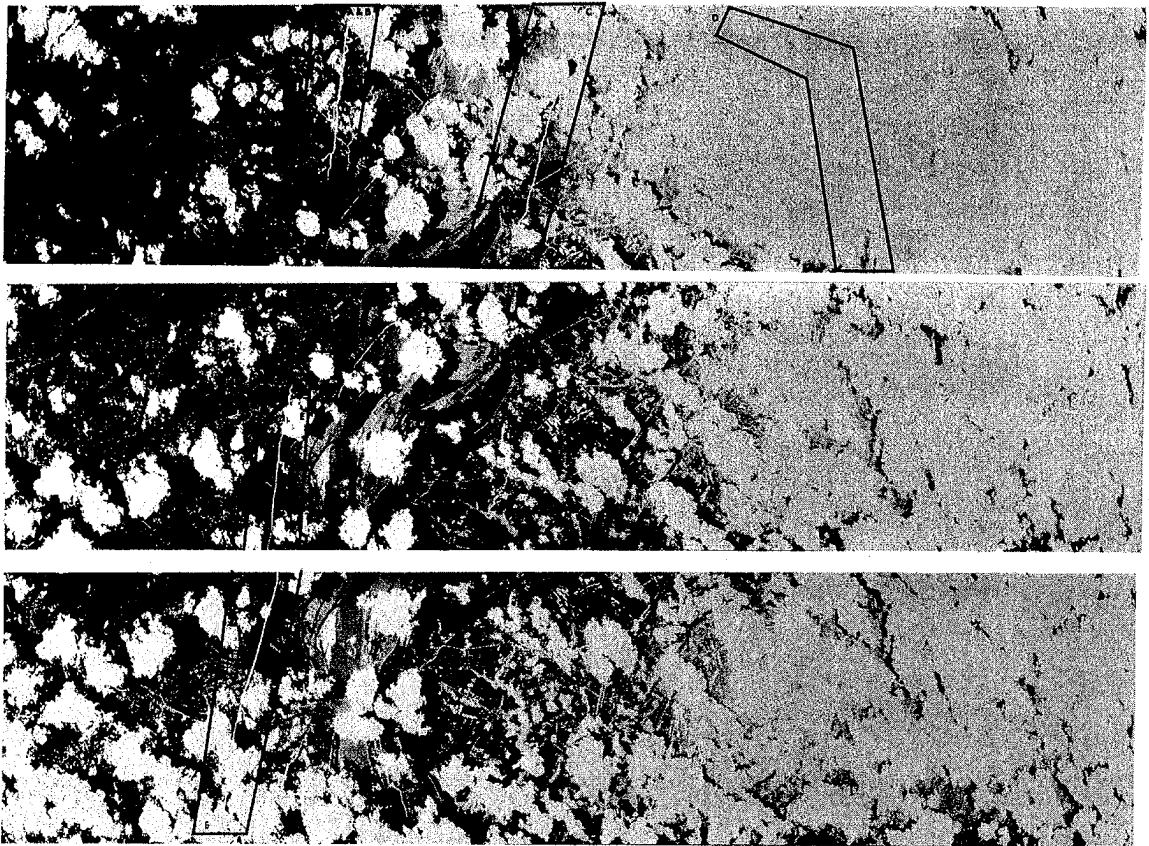
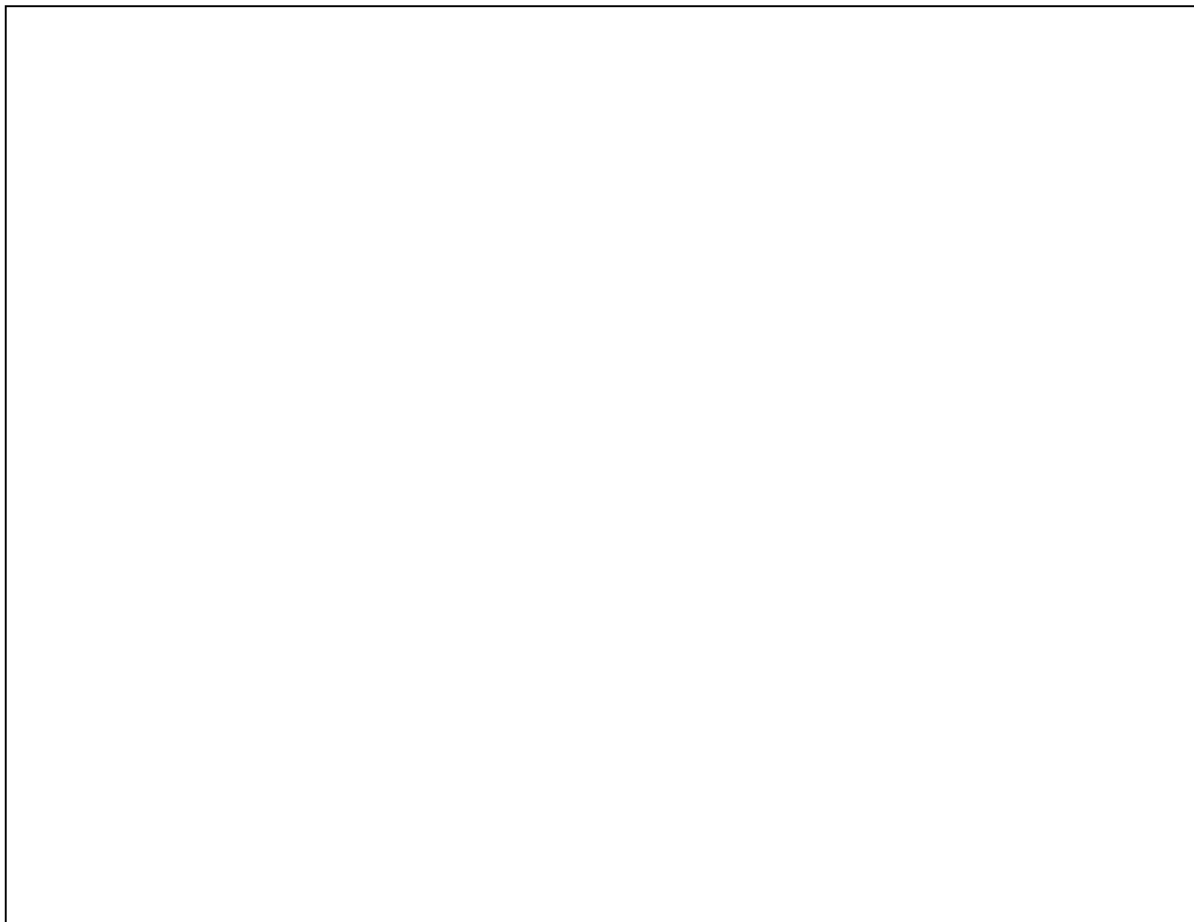


Figure 18b. BLACK SHIELD Photography of Missile Vapor Trails



BX6737

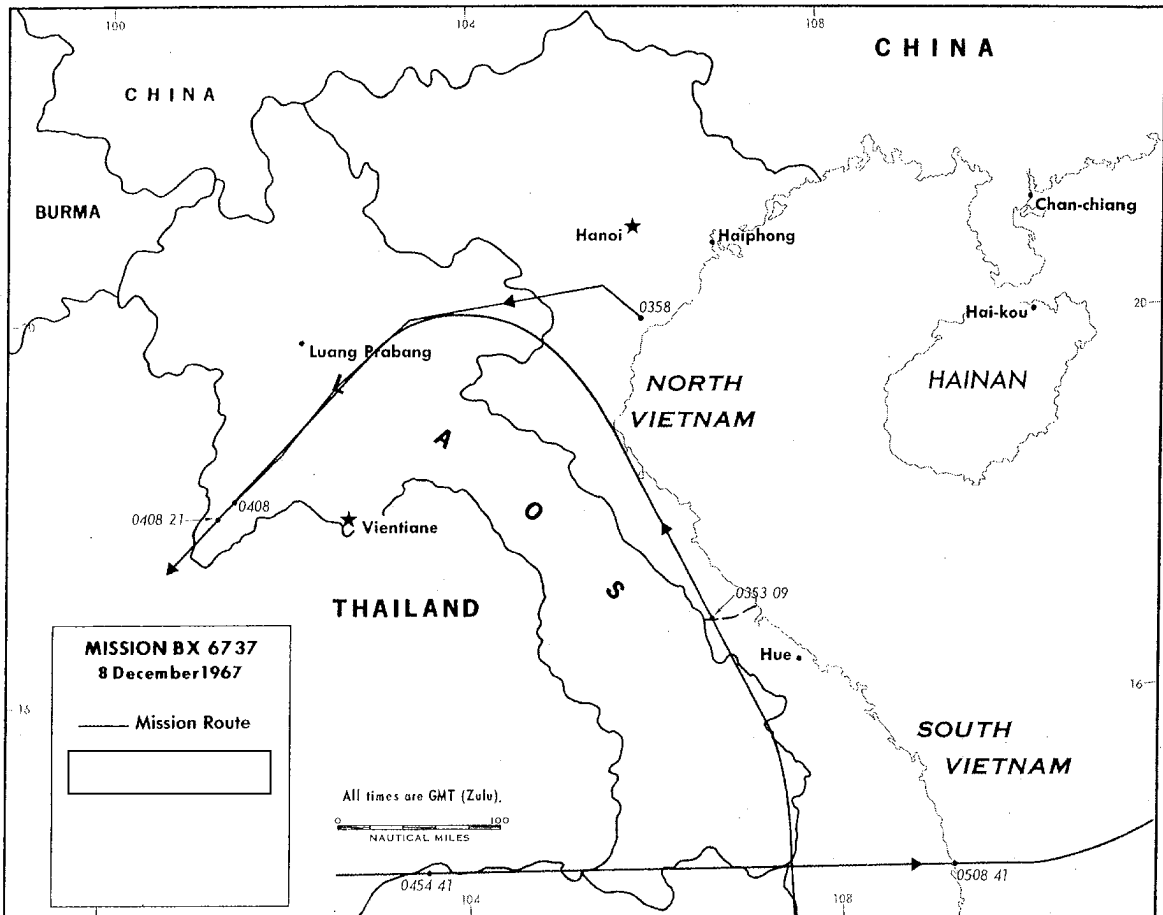
BLACK SHIELD mission BX6737 was a high-altitude, single-pass reconnaissance mission flown over the Cambodian/South Vietnamese and Laotian/North Vietnamese border areas on 8 December 1967. The mission entered Southeast Asia at 0340:15Z and exited same at 0505:41Z. Figure 20 shows the flight route and associated air surveillance tracking.

Seven specified priority search areas in northeastern Cambodia, southeastern Laos, and adjacent South Vietnam were covered for evidence of Viet Cong or North Vietnamese activity. BLACK SHIELD photography provided evidence of expanded supply transshipment facilities along the Tonle Kong River in Cambodia

near the Laotian border. Several troop encampments served by numerous trails extending north to Cambodian Route 97 were detected. A probable new storage area and water-to-road transshipment point were also identified.

[redacted] No defensive system was active during the overnight.

[redacted]



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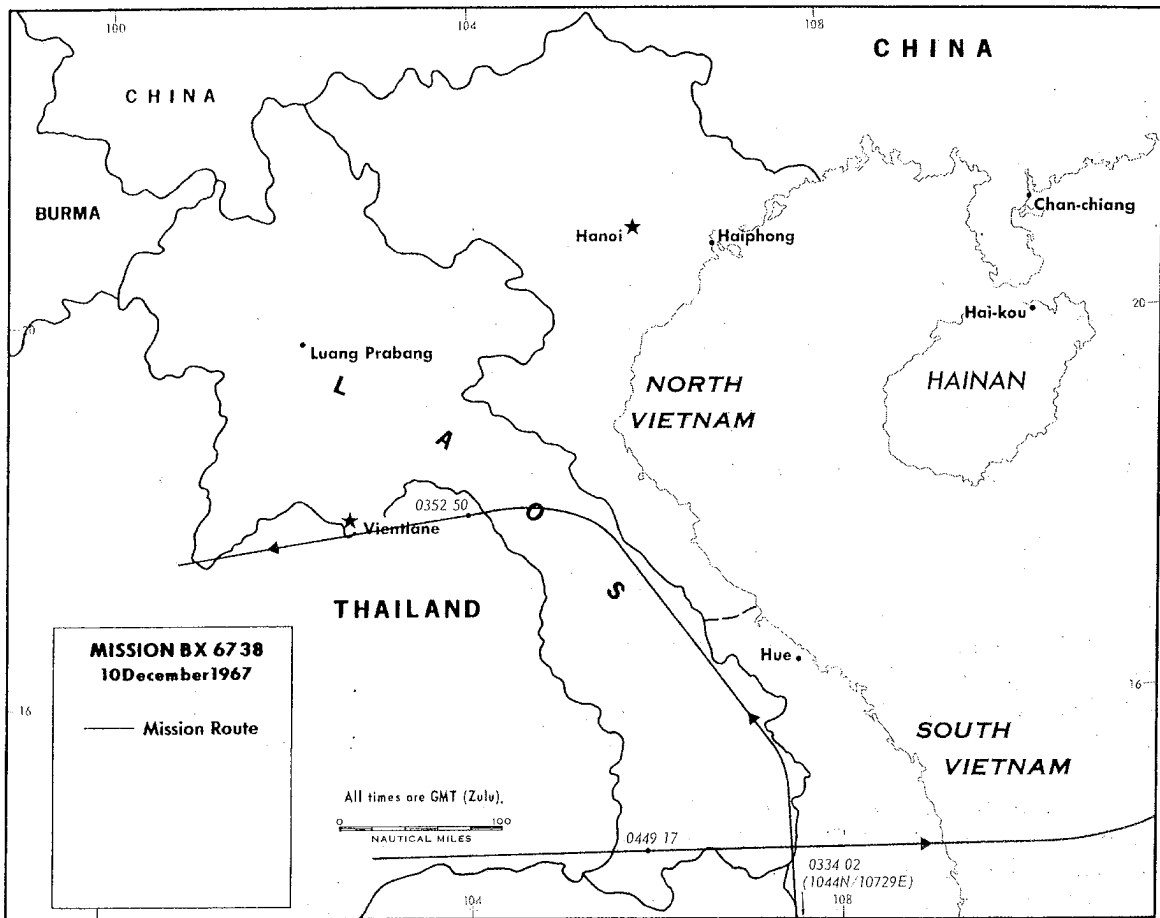
Figure 20

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BX6738

BLACK SHIELD mission BX6738 was a single-pass reconnaissance mission flown over the Cambodian, Laotian, and South Vietnamese tri-border area on 10 December 1967. The mission entered and exited over South Vietnam at 0334:02Z and 0455:37Z. Figure 21 is a plot of the mission route.

Mission photography detected a new probable transshipment-storage facility on the Tonle Son River in Cambodia near the South Vietnamese border. Photography also showed a heavily used trail extending from Cambodia into the north-western corner of Darlac Province in South Vietnam. Two automatic weapons positions were observed near the trail just inside the Cambodian border.



There were no threat signals recorded nor defensive system activated during the overflight. There was no evidence of air surveillance tracking [redacted]

BX6739

BX6739 was a double-pass, high-altitude mission flown over North Vietnam on 15 December 1967. The vehicle entered and exited North Vietnam on its first pass at 0421:42Z and 0430:23Z and on its second pass at 0529:49Z and 0540:47Z. Figure 22 is a plot of the mission route and associated air surveillance tracking.

Mission photography obtained from this two-pass mission was clear, interpretable, and generally cloud free. No evidence of surface-to-surface missile deployment was noted. All of North Vietnam's major airfields, except Haiphong/Cat Bi, appeared to be serviceable. The mission aircraft photographed 105 COMIREX targets, 15 of which were North Vietnamese SA-2 sites. Eighteen of these sites were occupied. 17

[redacted] None of these signals appeared to be tracking the vehicle, and no defensive mechanism was activated by these signals.

The BLACK SHIELD vehicle was tracked [redacted] North Vietnamese air defense facilities from 0416Z to 0437Z and from 0525Z to 0557Z. [redacted]

DOD strike/jamming operations were conducted during the overflight period.

BX6740

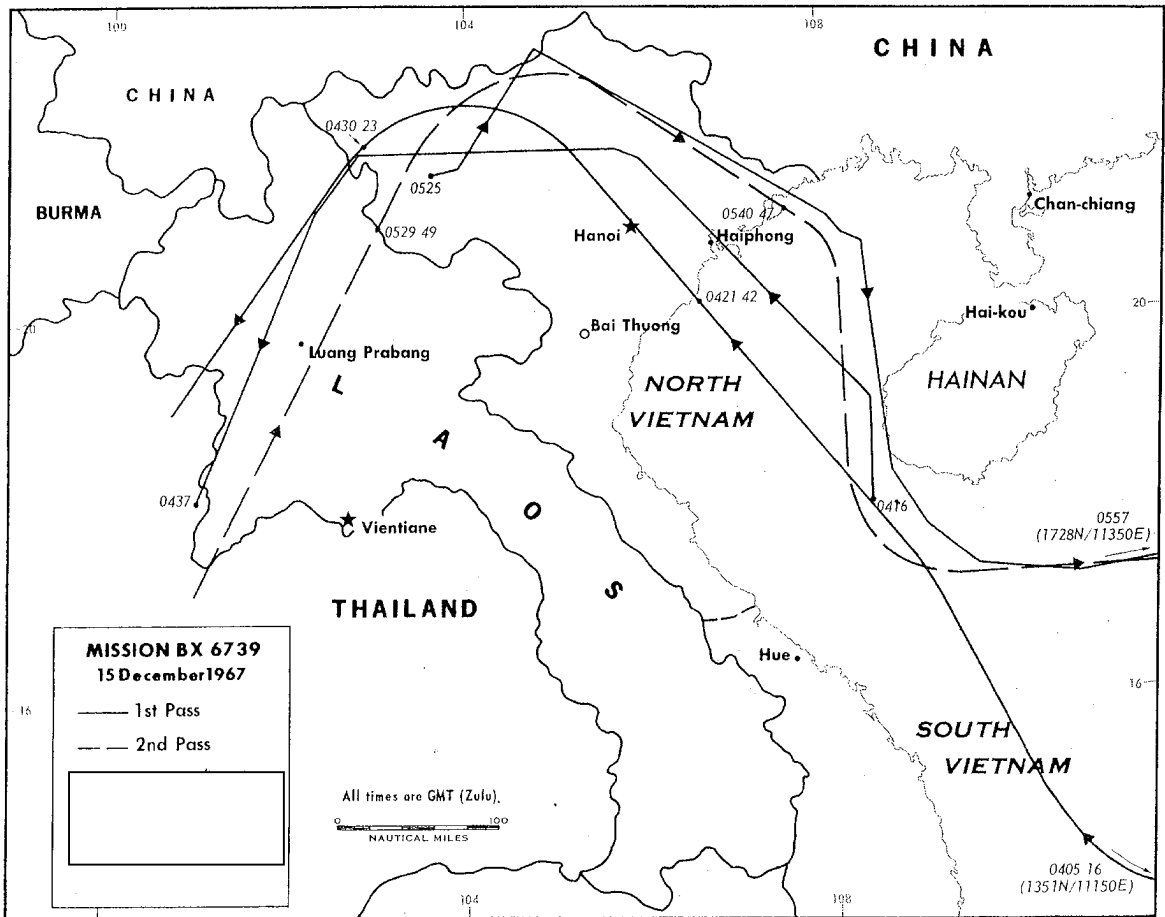
BX6740 was a double-pass reconnaissance mission flown over North Vietnam on 16 December 1967. The mission vehicle entered and exited North Vietnam on its first pass at 0257:51Z and 0309:21Z and on its second pass at 0405:00Z and 0418:03Z. Figure 23 presents the flight route and air surveillance tracking.

Mission photographs obtained about 60-percent cloud-free coverage of the target area. No evidence of SSM deployment was noted. The mission aircraft photographed 124 COMIREX targets, 19 of which were SA-2 sites. Two of these sites were occupied. Missions BX6739 and BX6740, flown on consecutive days, photographed 221 of North Vietnam's 226 useable SA-2 sites, including six new sites. Twenty were occupied, including five of the six new sites. 8

[Redacted] No on-board defensive system was activated.

[Redacted]

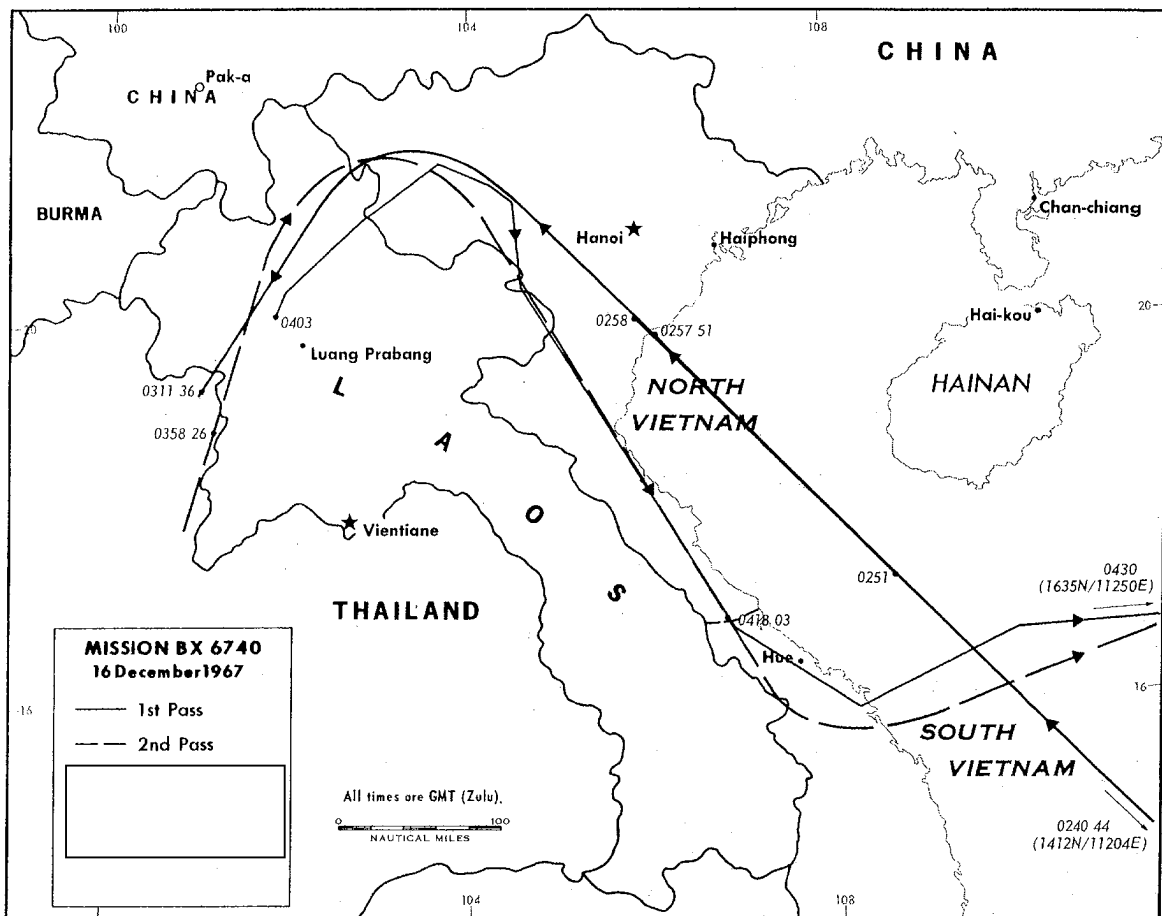
Moderate DOD strike/jamming operations were being conducted during the overflight.



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Figure 22

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Figure 23



Figure 24

APPENDIX I

BLACK SHIELD Operational Missions Alerted Between
16 August and 31 December 1967

<u>Mission No.</u>	<u>Date</u>	<u>Remarks</u>
BX6716	20 Aug. 1967	Flown
BX6717	25 Aug. 1967	Cancelled due to weather
BX6718	30 Aug. 1967	Flown
BX6719	31 Aug. 1967	Cancelled due to weather
BX6720	5 Sept. 1967	Cancelled due to weather
BX6721	10 Sept. 1967	Cancelled due to weather
BX6722	15 Sept. 1967	Flown
BX6723	16 Sept. 1967	Flown
BX6724	1 Oct. 1967	Cancelled due to weather
BX6725	3 Oct. 1967	Flown
BX6726	4 Oct. 1967	Cancelled (Ops decision)
BX6727	5 Oct. 1967	Flown (1 pass flown)
BX6728	14 Oct. 1967	Flown
BX6729	17 Oct. 1967	Flown
BX6730	19 Oct. 1967	Cancelled due to weather
BX6731	25 Oct. 1967	Cancelled due to weather

APPENDIX I (continued)

<u>Mission No.</u>	<u>Date</u>	<u>Remarks</u>
BX6732	27 Oct. 1967	Flown
BX6733	28 Oct. 1967	Flown
BX6734	29 Oct. 1967	Flown
BX6735	1 Nov. 1967	Cancelled due to weather
BX6736		Cancelled due to weather
BX6737 (Cambodia)	6 Dec. 1967	Flown
BX6738 (Cambodia)	8 Dec. 1967	Flown
BX6739	14 Dec. 1967	Flown
BX6740	15 Dec. 1967	Flown
BX6741	22 Dec. 1967	Cancelled due to weather

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APPENDIX II

COMIREX Targets Covered by BLACK SHIELD Missions
16 August - 31 December 1967

COMIREX Number	Target	Mission Numbers*																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Hai Kou Airfield					x✓														
	Ling Shui Airfield					x✓														
	Meng Tzu Airfield West	x✓	x✓	X							X									
	Haiphong/Cat Bi Airfield ✓	x✓				x✓									x✓					x✓
	Haiphong/Kien An Airfield ✓	x✓			X	x✓									x✓					x✓
	Hanoi/Bac Mai Airfield	x✓			x✓	x✓									x✓					x✓
	Hanoi/Gia Lam Airfield	x✓			x✓	x✓									x✓					x✓
	Phuc Yen Airfield ✓	x✓			x✓	x✓									x✓					x✓
	Lang Son Airfield NAN NING				X						x✓				(x)	x✓	X			x✓
	Kep Airfield	x✓			X	x✓									x✓	x✓	(X)			x✓

*In this appendix, mission numbers are shortened to the last two digits.

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APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers															
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40	
	Ning Ming Airfield			X			x✓				x✓	X					
	Chia Lai Shih Airfield	(x)				x✓											
	Ping Yuan Chieh Airfield	(x)	X		x✓							X					
	Tien Yang Airfield	(x)			x✓						x✓						(x)
	Yen Bai Airfield	x✓			x✓							x✓					X
	Hoa Lac Airfield	x✓			x✓						x✓						x✓
	Bai Thuong Airfield (2C0986)																x✓
*	The Khoi Helicopter Dispersal Area	x✓															
*	Kep Ha Airfield	x✓															
*	Hanoi Helicopter Dispersal Area	x✓															
*	Hoa Lac Helicopter Dispersal Area																
*	Dien Bien Phu A/F																
* Unnumbered.	2124N-18361E																
	Tien Yang AIF																

APPENDIX II (continued)

COMIREX
Number

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Chin Ping Infantry Division						X				X									
	Headquarters A Barracks				X						X					X				X
	<i>U.S. M.I.G. Hwy Ferry</i>																			
	Ban Lot A Barracks				X						(X)									X
	Ha Giang Military Area	X		X	X						X									X
	Van Hoi Military Areas	X		X	X						X									X
	Wen Shan Army Barracks West				X		X													X
	Ho Kou Army Barracks North	X	X	X	X	X					X									X
	Yen Shan Military Barracks and Storage Area				X															
	Lang Son Army Barracks			X	X						X									X
	Y Son Ammunition Depot			X	X	X					X									X
	Xom Hau A Army Supply Depot			X	X	X					X									X
	Ngoc Thi Barracks Supply Depot																			X

APPENDIX II (continued)

COMIREX

COMIREX Number	Target	16	18	22	23	25	27	28	29	32	33	34	37	38	39	40
	Tai Xouan Army Barracks, Nam Vu						X				x✓					
	Loc Binh Army Supply Depot	x ✓		X						x✓	x✓				x✓	
	Yen Bai Ordnance Depot										x✓					
	Thai Nguyen Army Supply Depot North					x✓			X		x✓					x✓
	Bac Can Barracks A Supply Depot					x✓			X	X	x✓					
	Bac Giang Military Areas T 120-YANG Pass ML 1031	x ✓			X	x✓	X		x✓	X	x✓	x✓				x✓
	Tung Chia Army Barracks					x✓										
	Ba Binh Special Area 2009							x✓			x✓					x✓
	Ben Than Special Area 2013							x✓								
	Vinh An Special Area 2014							x✓			x✓					
	Vit Thu Lu/NVN Special Area							x✓			x✓					x✓

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	An Cap Railroad Hanoi Thai Nguyen				X	X			XU	XU									X	
	Ping Hsiang/Hanoi Railroad Segment 4	XU		XU	XU		XU			XU	XU								XU	
	Ho Kou Highway Segment, Route 24A							XU											XU	
	Uong Bi Transformer Power Plant																		XU	
	Tien Pao Hwy. Sec. Route 25A																		XU	
	Chin Nan Kuan Hwy. Sec.																		XU	
	Ping Hsiang Complex	XU		XU	XU		XU			XU	X								X	
	Wen Shan Complex			XU	XU														X	
	Dong Dang Railroad Yard	XU		XU	XU		XU			XU	XU								XU	
	Bac Giang Complex	XU				XU				XU	XU								XU	

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APPENDIX II (continued)

COMIREX

Number

Target	Mission Numbers														
	16	18	22	23	25	27	28	29	32	33	34	37	38	39	40
Cao Bang Military Complex	x✓		x✓	X		x✓			x✓					x✓	
Lai Chau Complex	x✓	x✓	x✓					x✓		x✓				x✓	x✓
Lang Son Complex	x✓		x✓	X				x✓		x✓				x✓	
Mon Cai Complex					x✓					x✓				(x)	x✓
Tien Yen Complex				X	x✓	x✓		x✓	x✓	x✓				x✓	
Binh Lu Area						x✓									
Tuyen Quang Complex															
Yen Bai Complex	x✓			X										X	
Dien Bien Phu Complex	x✓	x✓	x✓	X				X	x✓					(x)	x✓
Kep Complex	x✓			X	x✓			x✓	x✓	x✓				(x)	
Lao Cai Complex	x✓	x✓	x✓	X	x✓			X	x✓					X	
Haiphong Railroad Station Classification Yard															(x)

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
[Redacted]	Haiphong Railroad Station				X	x✓														
	Classification Yard and Shops	x✓							X	x✓	x✓									
	Viet Tri Railroad Yard	x✓		x✓	X	x✓			x✓	x✓	x✓									
*	Yen Vien Railroad																			
	Classification Yard	x✓			X	x✓			x✓	x✓	x✓									
[Redacted]	Thai Nguyen Rail Activity																			
	Kep Railroad Yard																			
	Highway Segment 10E																			
	Haiphong Highway Bridge																			
	Van Diem Battery Plant																			
	Hanoi Railroad - A Highway																			
	Bridge																			
	Haiphong Warehouse Area Port																			
	Van Diem Vehicle Depot																			

*Unnumbered.

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
*	Thai Nguyen Unidentified Construction Activity					x✓														
*	Hanoi/Haiphong Railroad					x✓														
*	Hanoi/Haiphong Railroad					x✓			x✓											
*	Hanoi Transformer Power Plant																			x✓
*	Haiphong Transformer Power Plant East																			x✓
*	Haiphong Transformer Power Plant West																			x✓
*	Viet Tri Transformer Power Plant																			x✓
*	Hon Gai Transformer Power Plant																			x✓
*	Bac Giang Transformer Power Plant																			x✓
	<u>*Unnumbered.</u>																			x

*Unnumbered. Tien Yen P 106 T PP

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APPENDIX II (continued)

COMIREX

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Hanoi SAM Search	(x)		x	x	x				x										
	Lao Cai SAM Search	(x)	(x)	x	x	x				x										
	Dien Bien Phu SAM Search	(x)	(x)	x	x	x				x										
	Vinh SAM Search																			
	Cao Bang SAM Search	(x)		x																
	Dong Hoi SAM Search																			
	[Redacted]																			

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APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Yen Bai SAM Site B-12-2	x		x												x		x		
	Yen Bai SAM Site C-10-2																	x		
	Yen Bai SAM Site B-11-2																	x		
	Yen Bai SAM Site C-03-2																	x		
	Yen Bai SAM Site C-07-2																	x		
	Yen Bai SAM Site C-09-2																	x		
	Yen Bai SAM Site C-09A-2																	x		
	Yen Bai SAM Site C-17-2		x														x			
	Yen Bai SAM Site B-06-2																	x		
	Yen Bai SAM Site C-04-2																	x		
	Yen Bai SAM Site B-05-2																	x		

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
[Redacted]	Yen Bai SAM Site B-10-2																	x	x	
	Yen Bai SAM Site B-11A-2																		x	
[Redacted]	Hanoi SAM Site B-17-2																		x	

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Hanoi SAM Site B-21-2	x				x				x				x						
	Hanoi SAM Site C-28-2	x				x				x				x						
	Hanoi SAM Site D-31-2	x				x				x				x						
	Hanoi SAM Site A-11-2	x				x														
	Hanoi SAM Site A-24-2	x				x														
	Hanoi SAM Site D-31A-2	x				x														
	Hanoi SAM Site D-16-2	x				x														
	Hanoi SAM Site D-36-2	x				x														
	Hanoi SAM Site C-06-2	x				x														
	Hanoi SAM Site C-07-2	x				x														
	Hanoi SAM Site D-31B-2	x				x														
	Hanoi SAM Site E07-2	x				x														

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APPENDIX II (continued)

COMIREX

Number

	<u>Target</u>	16	18	22	23	25	27	28	29	32	33	34	37	38	39	40
	Haiphong SAM Site A-29-2	x				x			x	x		x				
	Haiphong SAM Site A-20-2	x		x					x	x		x				
	Haiphong SAM Site A-17-2	x				x			x	x		x				
	Haiphong SAM Site B-01-2					x	x					x				
	Haiphong SAM Site A-29A-2	x				x	x		x	x		x				
	Haiphong SAM Site B-33-2	x				x										
	Haiphong SAM Site B-06-2					x										
	Haiphong SAM Site C-32-2	x				x										
	Haiphong SAM Site C-32A-2	x				x			x			x				
	Haiphong SAM Site B-28-2	x				x				x						
	Haiphong SAM Site B-30-2	x				x										
	Haiphong SAM Site A-07-2					x	x									

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APPENDIX II (continued)

COMIREX
Number

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Haiphong SAM Site A-23-2	x				x				x										x
	Haiphong SAM Site A-31-2	x				x				x										x
	Haiphong SAM Site A-33-2	x				x				x										x
	Haiphong SAM Site C-30-2	x				x														x
	Haiphong SAM Site C-28-2	x				x				x										x
	Haiphong SAM Site A-02-2	x				x				x										x
	Haiphong SAM Site A-17A-2	x				x				x										x
	Haiphong SAM Site D-35-2	x				x				x										x
	Haiphong SAM Site A-33A-2	x				x				x										x
	Thanh Hoa SAM Site B-28-2																			
	Thanh Hoa SAM Site C-02-2																			x
	Thanh Hoa SAM Site B-01-2																			x

APPENDIX II (continued)

COMIREX
Number

	<u>Target</u>	<u>Mission Numbers</u>																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Thanh Hoa SAM Site B-02-2																			x
	Thanh Hoa SAM Site																			x
	Thanh Hoa SAM Site D-04-2																			x
	Thanh Hoa SAM Site C-03-2																			x
	Thanh Hoa SAM Site C-02A-2																			x
	Thanh Hoa SAM Site A-17-2									x										x
	Thanh Hoa SAM Site C-04-2																			x
	Thanh Hoa SAM Site D-02-2																			x
	Thanh Hoa SAM Site C-01-2																			x
	Thanh Hoa SAM Site D-03-2																		x	x
	Thanh Hoa SAM Site D-03A-2																			x

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																	
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40			
	Thanh Hoa SAM Site A-19-2										X							X	
	Thanh Hoa SAM Site B-28A-2										X								X
	Thanh Hoa SAM Site B-27-2										X								X
	Thanh Hoa SAM Site A-14-2																		X
	Thanh Hoa SAM Site D-20-2										X								X
	Thanh Hoa SAM Site D-20A-2										X								X
	Thanh Hoa SAM Site A-17A-2										X								X
	Thanh Hoa SAM Site A-13-2																		X
	Hanoi SAM Site D-04-2																X		
	Hanoi SAM Site C-30E-2																X		

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APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																			
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40					
	Haiphong SAM Site C-29-2	x				x			x											x	
	Haiphong SAM Site C-27-2	x				x															x
	Haiphong SAM Site C-26-2	x				x															x
	Haiphong SAM Site B-25-2	x				x															x
	Haiphong SAM Site A-29B-2	x				x															x
	Haiphong SAM Site A-26-2																				x
	Haiphong SAM Site A-22-2																				x
	Hanoi SAM Site B-01-2	x				x															x
	Hanoi SAM Site C-33-2	x				x															x
	Hanoi SAM Site B-01A-2	x				x															x
	Hanoi SAM Site A-33-2	x				x															x
	Hanoi SAM Site D-36A-2																				x

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
	Hanoi SAM Site E-22-2																			x
	Hanoi SAM Site C-17B-2	x				x		x	x											x
	Vinh C-19-2																			x
	Vinh C-32-2																			x
	Vinh B-16-2																			x
	Vinh																			
	Vinh																			
	Vinh																			
	Vinh C-32-2																			x
	Vinh																			
	Vinh D-32-2																			x
	Vinh A-07-2																			x

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APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers														
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40
	Vinh D-35-2															x
	Vinh C-31A-2										x					x
	Vinh															
	Thanh Hoa SAM Site C-03A-2															x
	Thanh Hoa SAM Site B-01A-2															x
	Thanh Hoa SAM Site C-01A-2															x
	Thanh Hoa SAM Site C-04A-2															x
	Thanh Hoa SAM Site D-21A-2										x					x
	Thanh Hoa SAM Site B-01B-2										x					x
	Thanh Hoa SAM Site D-21B-2															x
	Thanh Hoa SAM Site A-17B-2															x

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APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers															
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40	
	Hanoi SAM Site C-16-2	x				x				x					x		x
	Hanoi SAM Site A-05-2	x				x						x					x
	Hanoi SAM Site B-36B-2					x											x
	Hanoi SAM Site C-03B-2	x				x											x
	Hanoi SAM Site D-31C-2	x				x											x
	Hanoi SAM Site C-05B-2					x											x
	Hanoi SAM Site B-27-2	x															x
	Hanoi SAM Site B-13-2	x				x											x
	Hanoi SAM Site B-28-2	x															x
	Hanoi SAM Site B-04A-2	x															x
	Hanoi Prob. Site A																x
	Hanoi Prob. Site B																x

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APPENDIX II (continued)

COMIREX

Number

	<u>Target</u>	16	18	22	23	25	27	28	29	32	33	34	37	38	39	40
	Hanoi SAM Site C-01D-2	x				x									x	
	Hanoi SAM Site C-01E-2	x			x										x	
	Hanoi SAM Site C-29A-2	x		x						x					x	x
	Hanoi SAM Site B-34A-2	x		x											x	
	Hanoi SAM Site A-15-2				x				x						x	
	Hanoi SAM Site A-34-2				x				x						x	
	Hanoi SAM (A-29A)											x				
	Hanoi SAM (A-34-A)															
	Hanoi SAM Site D-35-2					x			x							
	Vinh SAM Site A-01A-2										x					
	Vinh SAM Site A-25-2							x								
	Hanoi Probable SAM															
	Equipment Training Area	x														

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers														
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40
	Nan San SAM Site A-12-2	x		x								x				
	Nan San SAM Site C-13-2															x
	Nan San SAM Site D-13-2															x
*	Hanoi SAM Site	x														
*	Hanoi SAM Site A-01A-2				x	x			x			x				
*	Hanoi SAM Site A-35-2					x										
*	Hanoi SAM Site B-23-2					x										
*	Hoa Binh SAM Site D-27-2					x										
*	Haiphong SAM Site A-25-2					x							x			
*	Haiphong SAM Site B-36-2					x									x	
*	Haiphong SAM Site A-16-2					x								x		
*	Haiphong SAM Site A-02A-2													x	x	

*Unnumbered.

APPENDIX II (continued)

COMIREX Number	Target	Mission Numbers																		
		16	18	22	23	25	27	28	29	32	33	34	37	38	39	40				
*	Haiphong SAM Site							x	x										x	
*	Thanh Hoa SAM Site D-31B-2									x										
*	Ban Xom Lom SAM Site					x													x	
	[Redacted]																			

*Unnumbered.

APPENDIX III



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BYE-1330/68

EO 12958 3.3(b)(1)>25Yrs

**BLACK SHIELD Reconnaissance Missions
1 January - 31 March 1968**

DST-BS/BYE/68-2
30 April 1968

CENTRAL INTELLIGENCE AGENCY

Directorate of Science and Technology

APPROVED FOR RELEASE
DATE: AUG 2007

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PREFACE

This report is the third in a series of resumes of the BLACK SHIELD reconnaissance program. This third resume spans the period from 1 January to 31 March 1968 and includes missions flown over North Vietnam and North Korea.

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BLACK SHIELD Reconnaissance Missions
1 January - 31 March 1968

SUMMARY

Fifteen BLACK SHIELD high-altitude reconnaissance missions were alerted during the period from 1 January to 31 March 1968. Six of the 15 missions were flown, four over North Vietnam and two over North Korea. Eight missions were cancelled due to weather conditions, and approval for one Korean mission was not obtained. (Appendix I lists these missions and related events.)

BLACK SHIELD photography of North Vietnam through 31 March 1968 revealed no evidence of surface-to-surface ballistic missiles, equipment, or facilities. Mission BX6843 photographed two suspect surface-to-surface (cruise) missile sites near Thanh Hoa. One site was unoccupied, and the second contained a few small unidentified objects.

The BLACK SHIELD program provided initial baseline coverage of North Korea on missions BX6847 and BX6853, with readable coverage of 70 percent of the country. These two missions supplied current photography of North Korean industrial and transportation systems and updated the existing order of battle. The ability of the BLACK SHIELD program to react rapidly is demonstrated by photographs of the USS Pueblo at anchor in Wonsan Bay obtained on mission BX6847. This mission was flown on 26 January, three days after the USS Pueblo was seized and one day after approval was granted. (Appendix II is a listing of the COMIREX targets photographed over North Korea.)

The BLACK SHIELD program has continued to supply good coverage of North Vietnam, particularly order of battle information of fighter aircraft and surface-to-air missile defenses. The program has contributed substantially to bomb damage assessment of point targets and of the interdiction effort directed against North Vietnamese road, rail, and water transportation systems. BLACK SHIELD missions have identified new targets and provided information [redacted]

[redacted] The tri-border area of South Vietnam, Laos, and Cambodia has also been covered well by BLACK SHIELD photography. BLACK SHIELD mission BX6856, flown over Khe Sanh and the border area of South Vietnam, provided strategic information of the hostile troop build-up, supply, and infiltration routes. (COMIREX targets photographed over North Vietnam are listed in Appendix III.)

All of the four North Vietnamese missions were tracked [redacted] North Vietnamese air surveillance facilities. One unsuccessful surface-to-air missile (SAM) was launched at the vehicle of mission BX6842. The missile fired during the overflight was launched with the Fan Song radar in low PRF (first observed on missions BX6732 and BX6734). This was the first known instance of a Soviet SA-2 missile's having been guided by information derived from the Fan Song guidance radar operating in the low-PRF mode.

[redacted]

[redacted] The initial evidence of EW tracking by the North Koreans occurred on BX6853 [redacted]

[redacted]

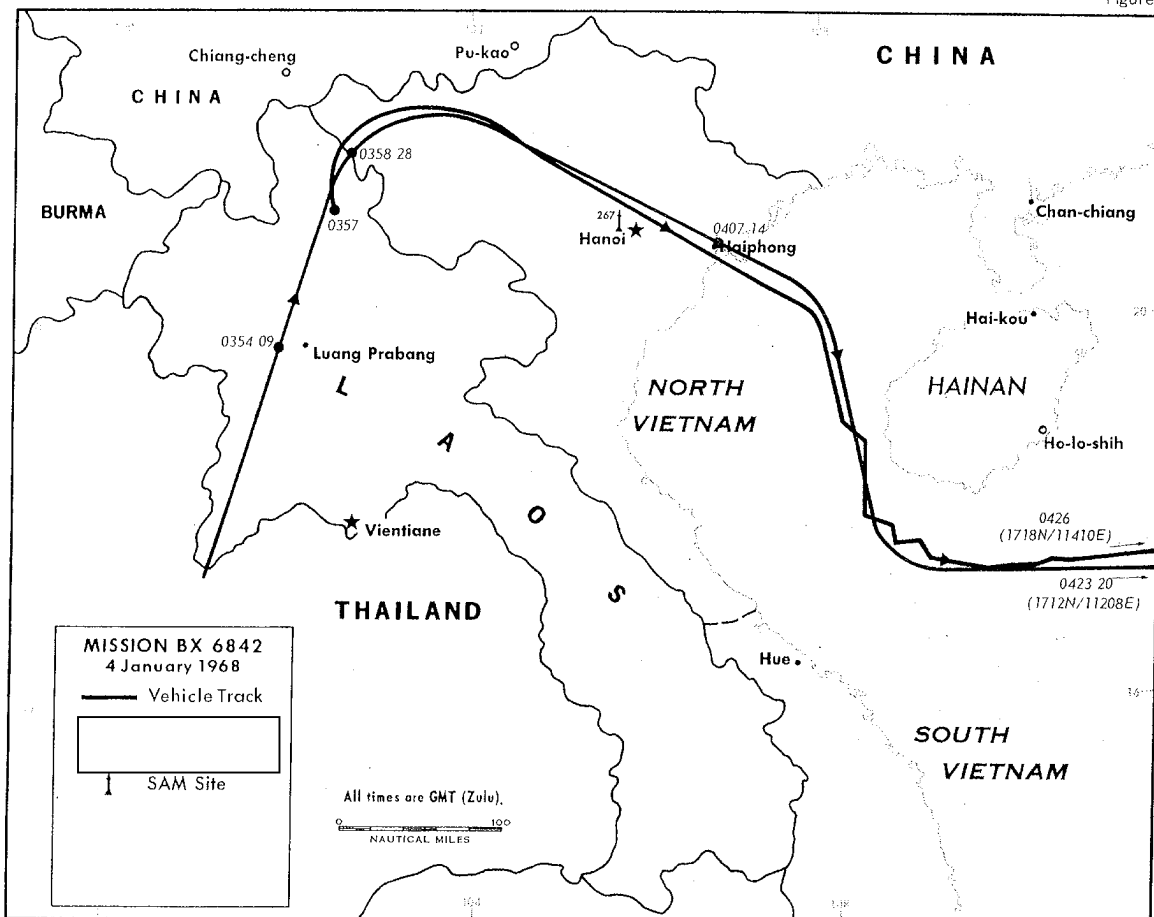
MISSION ANALYSIS

BX6842

BLACK SHIELD mission BX6842 was a single-pass, high-altitude reconnaissance mission flown over North Vietnam on 4 January 1968. The BLACK SHIELD vehicle entered and exited North Vietnam at 0358:28Z and 0407:14Z. The mission vehicle encountered a SAM reaction at approximately 0405Z. Figure 1 shows the mission route and associated events.

There was no indication of surface-to-surface missile (SSM) activity in the photographed areas. The BLACK SHIELD vehicle photographed 176 Chinese and North Vietnamese COMIREX targets plus 16 bonus (non-COMIREX) targets.

Figure 1



90702 4-68 CIA

Of the 176 COMIREX targets photographed, 139 were North Vietnamese SA-2 sites, 12 of which were occupied. The mission vehicle also photographed a number of probable cave defense sites near Hanoi and Haiphong.

[redacted] valid threat and activated
[redacted] Correlation and analysis
of all available data indicate that SAM site 267 (21°05'N, 105°44'E) launched a missile at the BLACK SHIELD vehicle at 0405:02Z. Figure 2 presents three photographs: one of smoke over site 267; a second of the launched missile, missile vapor trail and missile burn-out; and the third of missile detonation. Missile trajectory analysis from photography indicates the missile's approach to the mission vehicle was no closer than 8,000 feet and probably was much greater.

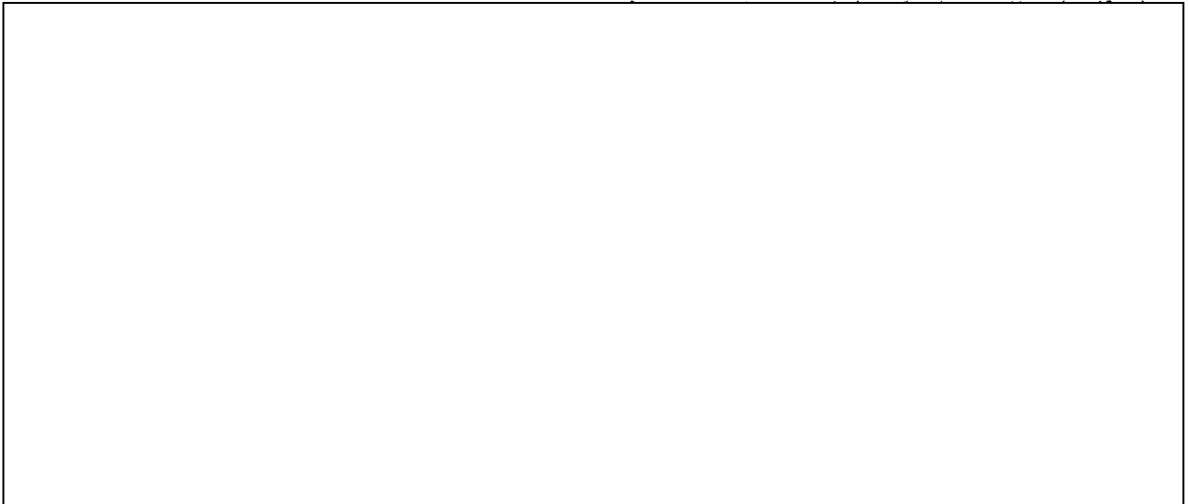
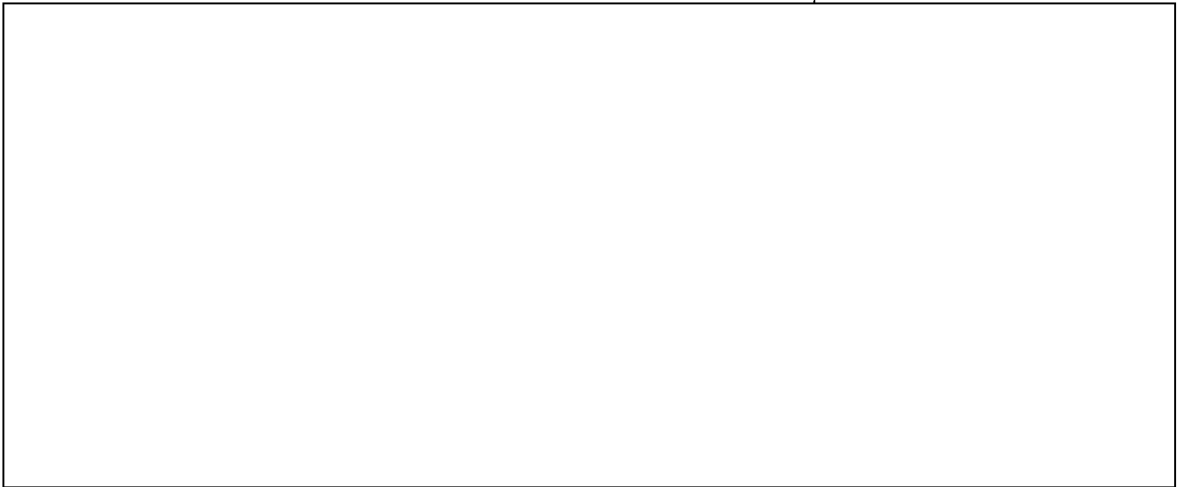
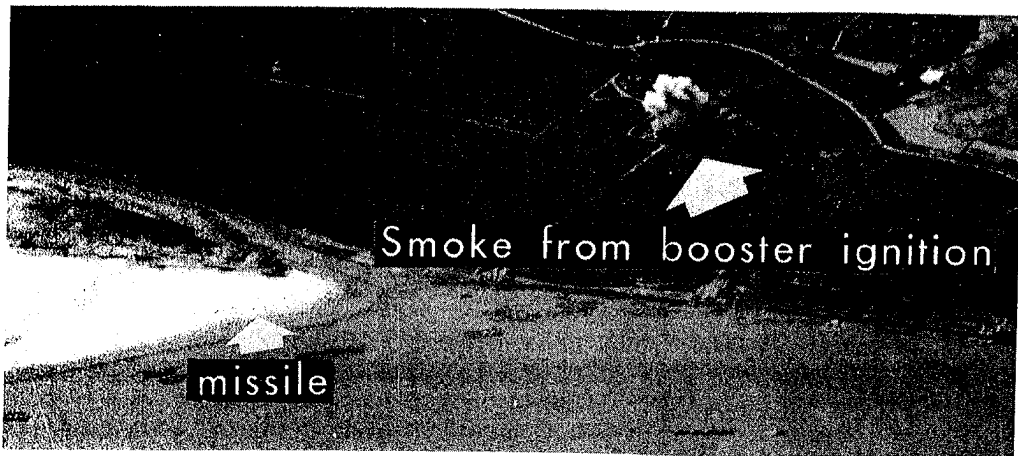
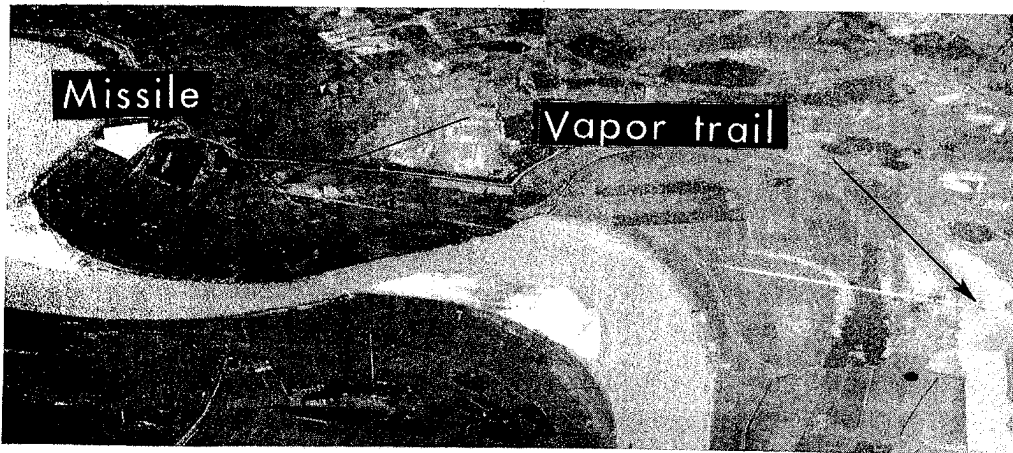


Figure 2. Photography of Missile Launched by Site 267



SA-2 launch

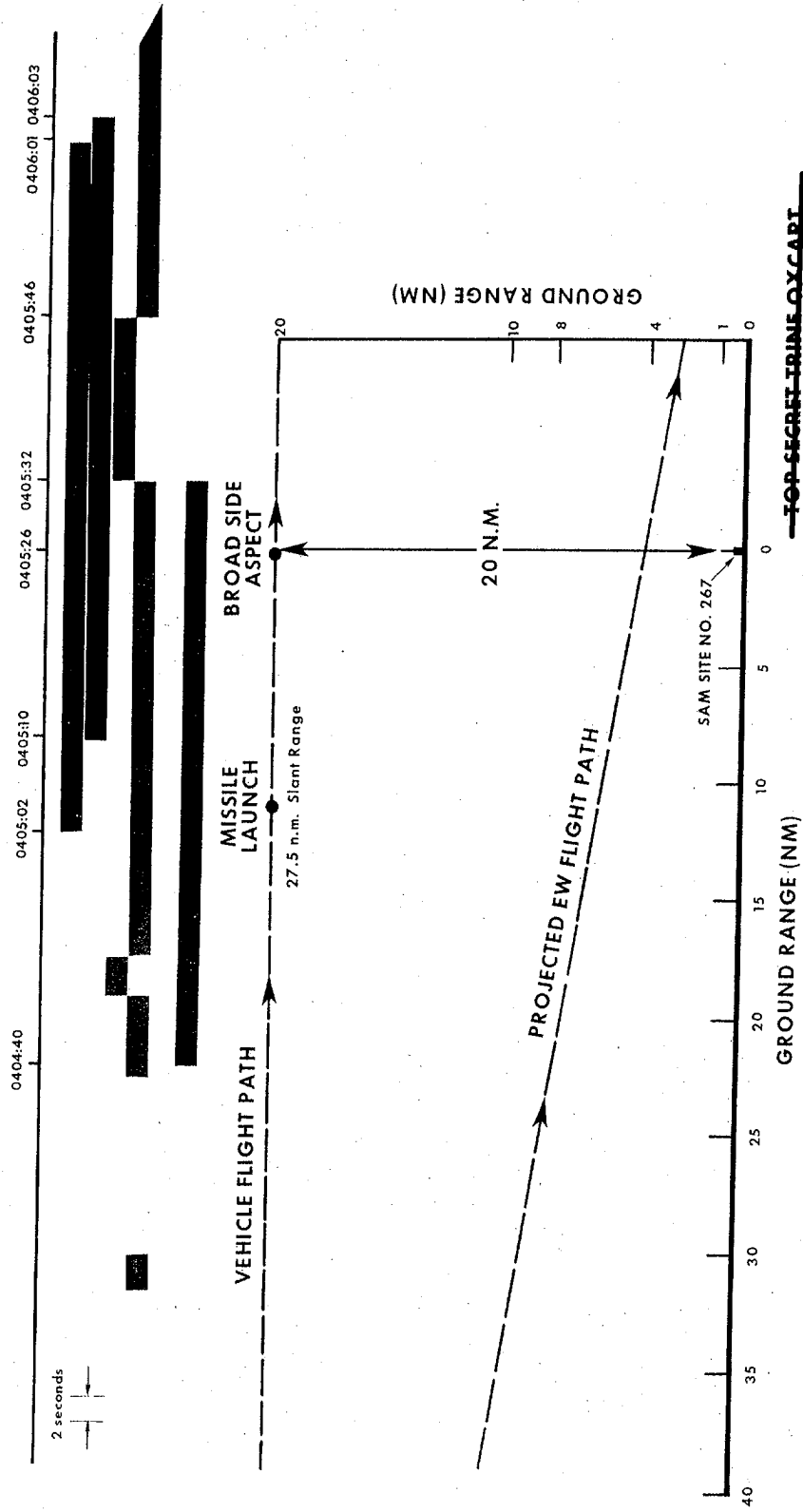


Flight & Missile Burnout

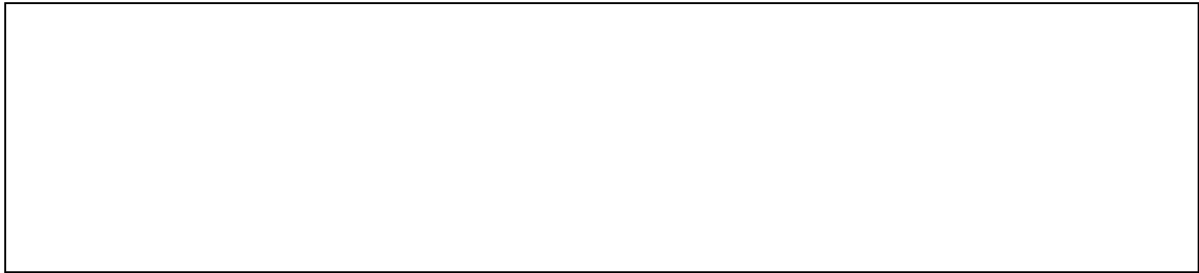


Warhead burst

Figure 3. Signal & Vehicle Flight Environment



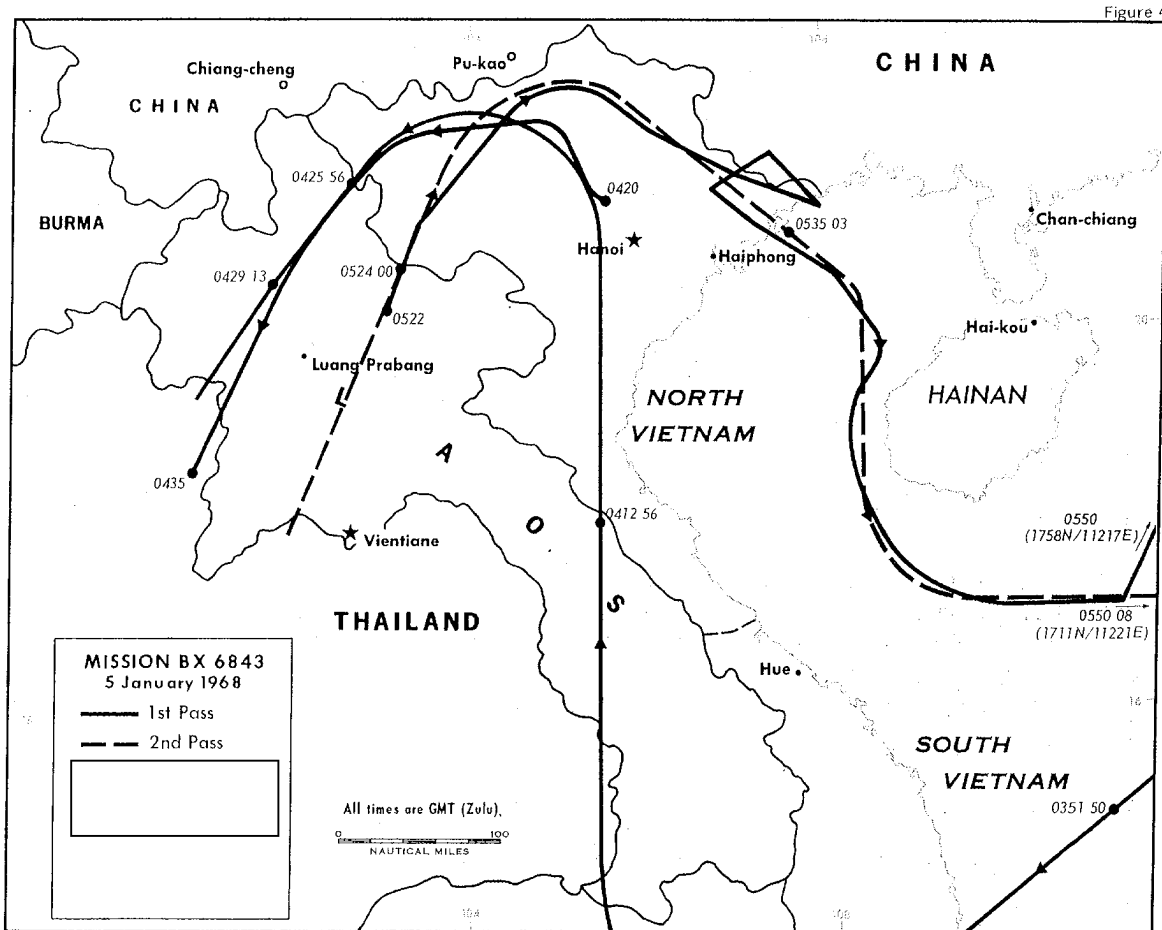
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Strike/jamming activity during the overflight period was moderate and restricted to the Haiphong area.

BX6843

This BLACK SHIELD mission was a double-pass overflight of North Vietnam flown on 5 January 1968. The vehicle entered and exited North Vietnam at



90203 4-68 CIA

0412:56Z and 0425:56Z on its first pass, and at 0524:00Z and 0535:03 on its second pass. Figure 4 is a presentation of the flight route and associated events.

Two suspect SS (cruise) missile sites near Thanh Hoa were photographed, one containing a few small unidentified objects and the other unoccupied. The BLACK SHIELD vehicle photographed 233 [redacted] North Vietnamese COMIREX targets plus 10 bonus (non-COMIREX) targets. Of the 233 COMIREX targets photographed, 182 were North Vietnamese SA-2 sites. Fifteen of these sites were occupied. This mission also provided photography of five of North Vietnam's major airfields and coverage of almost all of the rail network.

[redacted]
None of these signals appeared to be tracking the mission vehicle, and no defensive system was activated. Initial EW tracking was accomplished by [redacted]

[redacted]
There was little or no strike/jamming during the overflight period.

BX6847

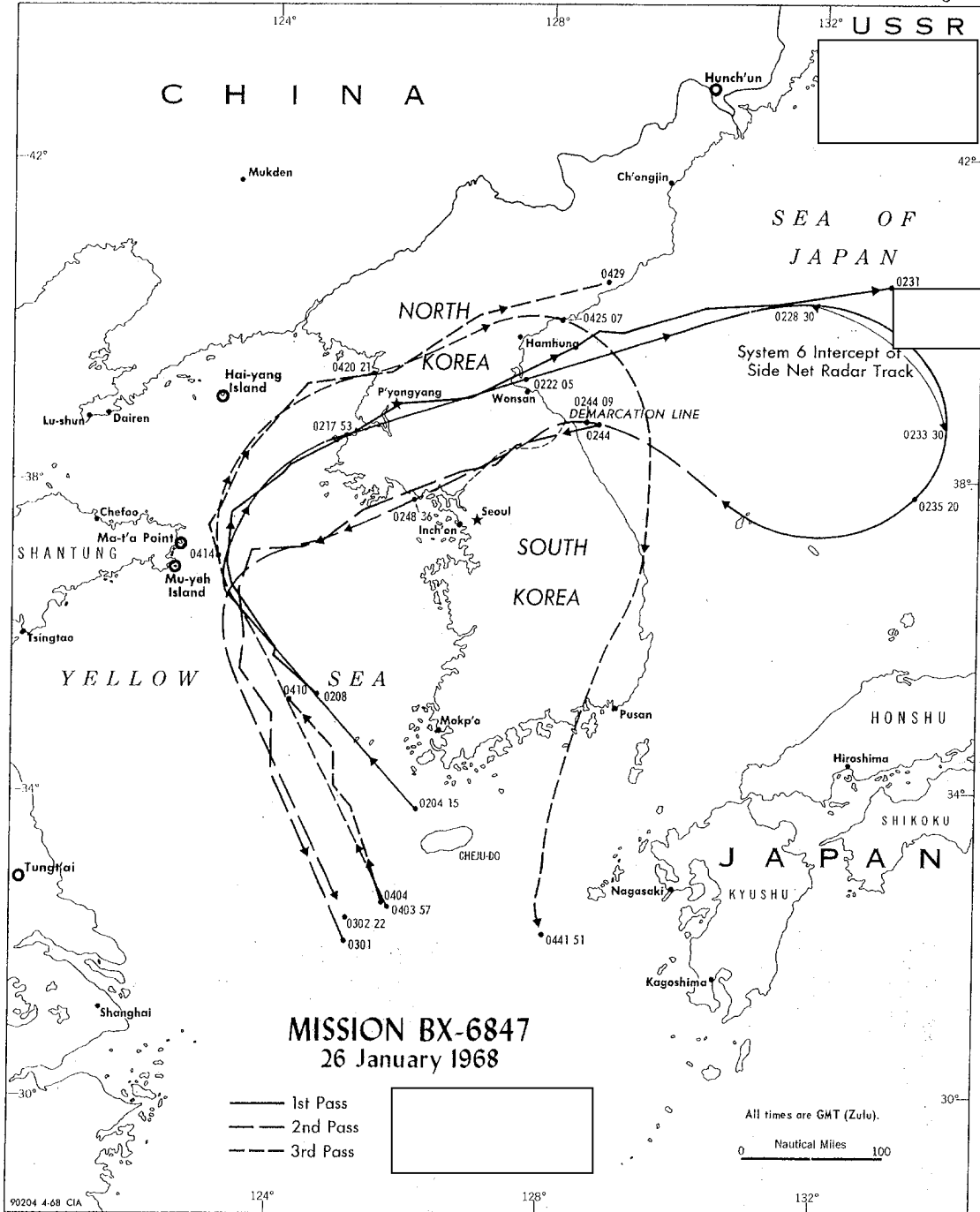
BLACK SHIELD mission BX6847 was a three-pass, high-altitude reconnaissance mission flown over North Korea on 26 January 1968. The mission vehicle was over the North Korean land mass on its first pass from 0217:53 to 0222:05, on the second pass from 0244:09 to 0248:36, and on the third pass from 0420:21 to 0425:07. Figure 5 presents the mission flight path and associated air surveillance events.

The BLACK SHIELD vehicle photographed 82 North Korean [redacted] COMIREX targets and 837 bonus targets. The mission obtained comprehensive baseline coverage of most of North Korea's armed forces and industry as well as large portions of the transportation system. The USS Pueblo and three new guided missile patrol boats (Komar PTG) were observed on photography of this mission. A BLACK SHIELD photograph of the USS Pueblo at anchor in a bay north of Wonsan is included in the examples of mission photography at the end of this report.

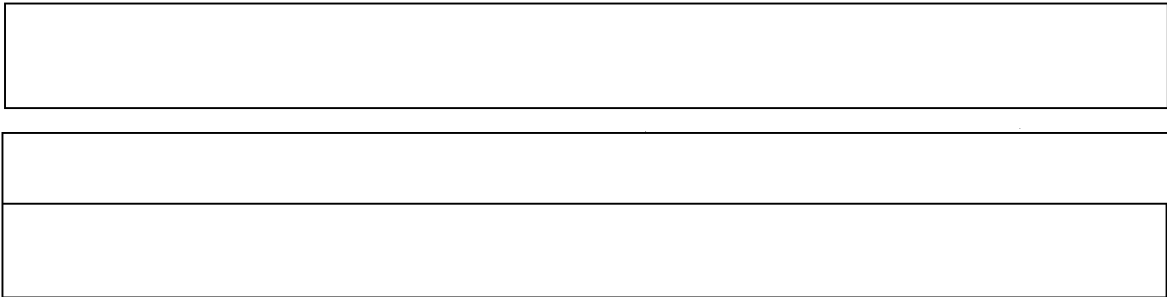
There was no indication of a hostile weapons reaction; no defensive system was activated during the overflight. [redacted]

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Figure 5



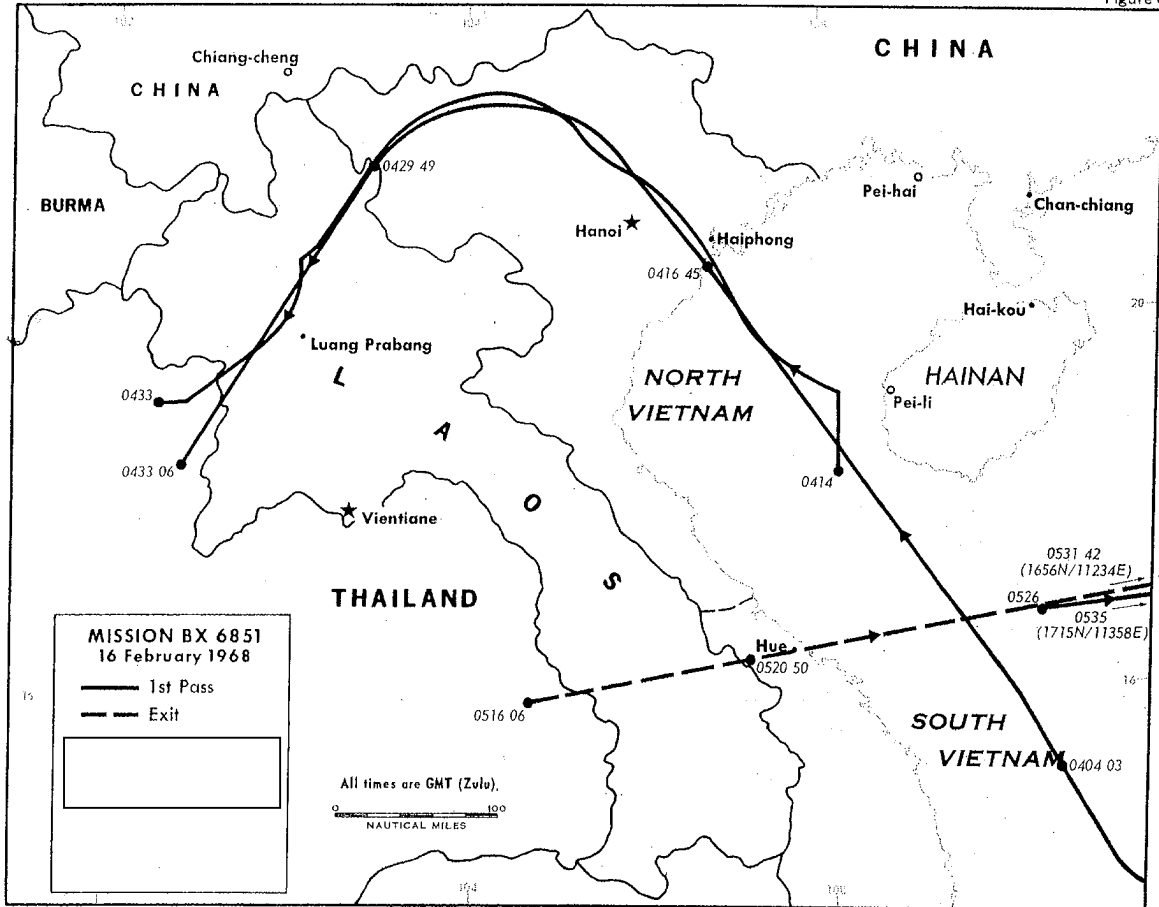
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BX6851

BLACK SHIELD mission BX6851 was a two-pass mission flown over North Vietnam on 16 February 1968. The vehicle entered North Vietnam on its first

Figure 6



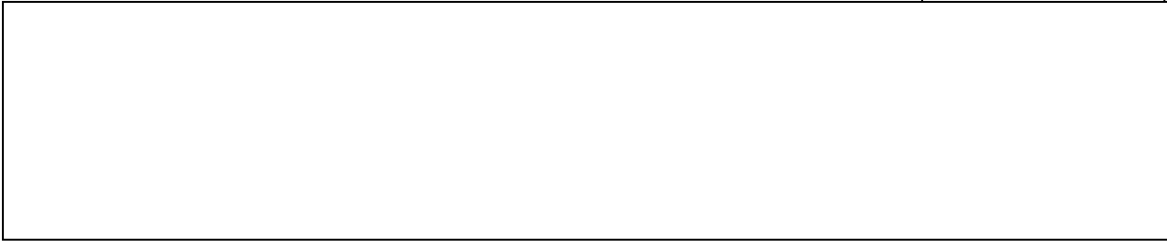
90205 4-48 CIA

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Handle via BYEMAN-COMINT Control Systems Jointly

pass at 0416:45 and exited at 0424:49. Overflight of the DMZ occurred from 0520:50 to 0521:46. Figure 6 is a plot of the mission route and associated tracking.

A rapid deterioration of weather over the target area resulted in little useable photography.

There was no indication of a hostile weapons reaction, and no electronic defensive equipment was activated during the overflight.

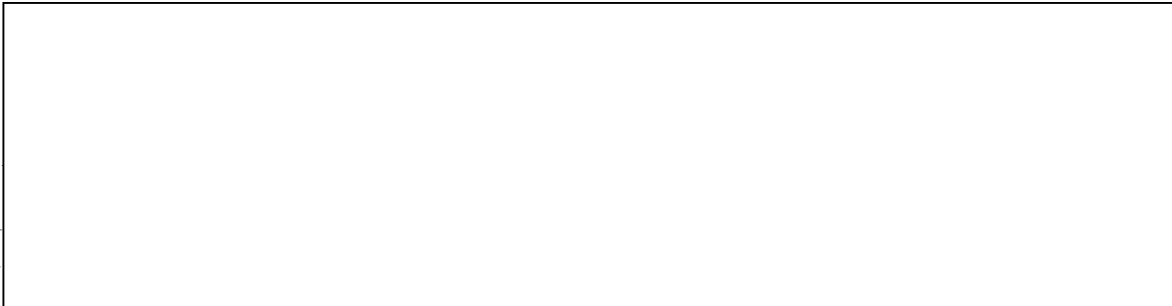


There was little or no strike/jamming activity during the overflight period.

BX6853

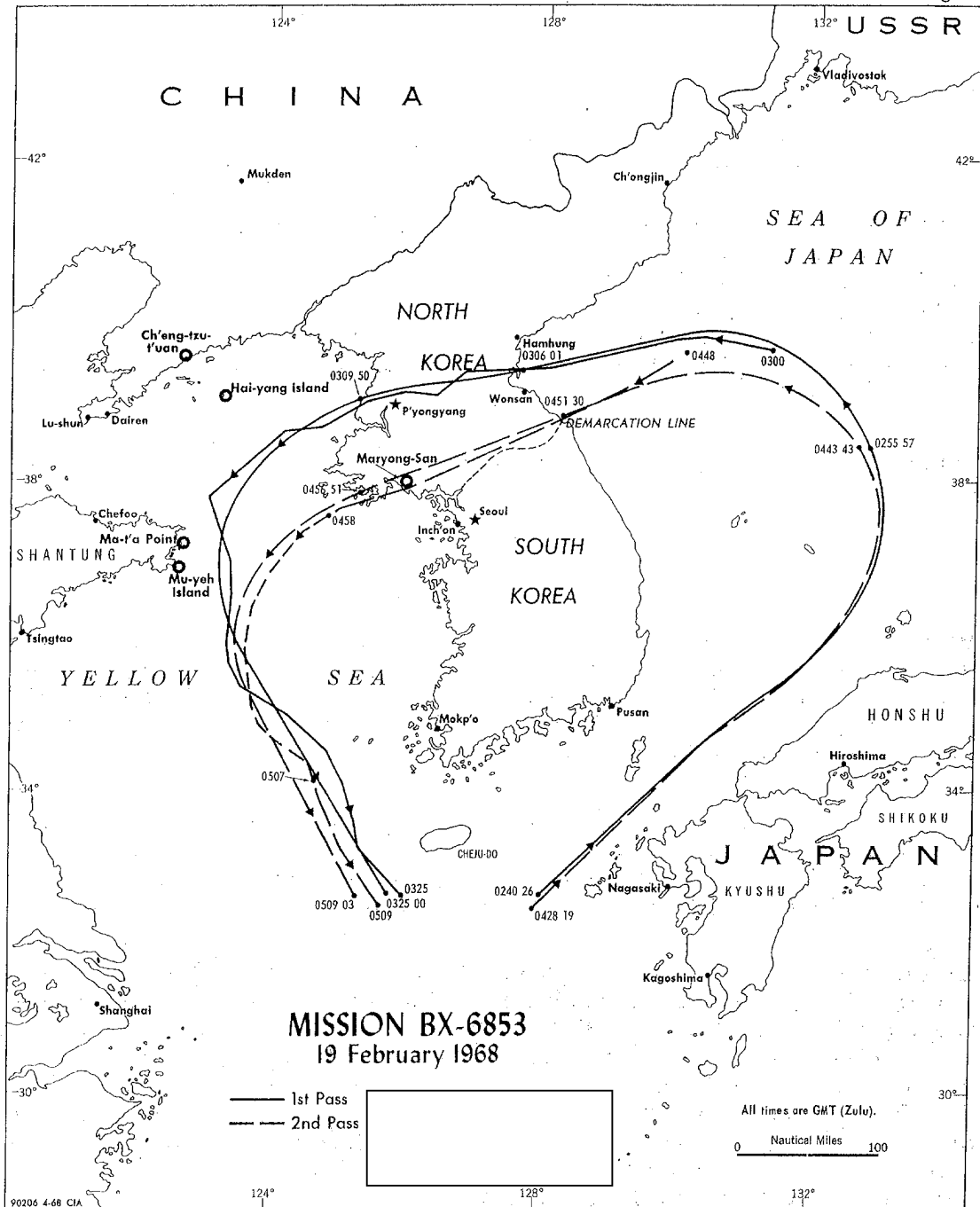
BLACK SHIELD mission BX6853 was a two-pass reconnaissance mission flown over North Korea on 19 February 1968. The mission vehicle penetrated and exited the North Korean land mass on its first pass at 0306:01 and 0309:50, and on its second pass at 0451:30 and 0456:51. Figure 7 is a plot indicating the mission route and related events.

The BLACK SHIELD vehicle photographed 84 North Korean COMIREX targets plus 89 bonus targets. Scattered clouds covered 20 percent of the area photographed, concealing the area in which the USS Pueblo was photographed on mission BX6847. One new, occupied SA-2 site was identified near Wonsan.



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Figure 7



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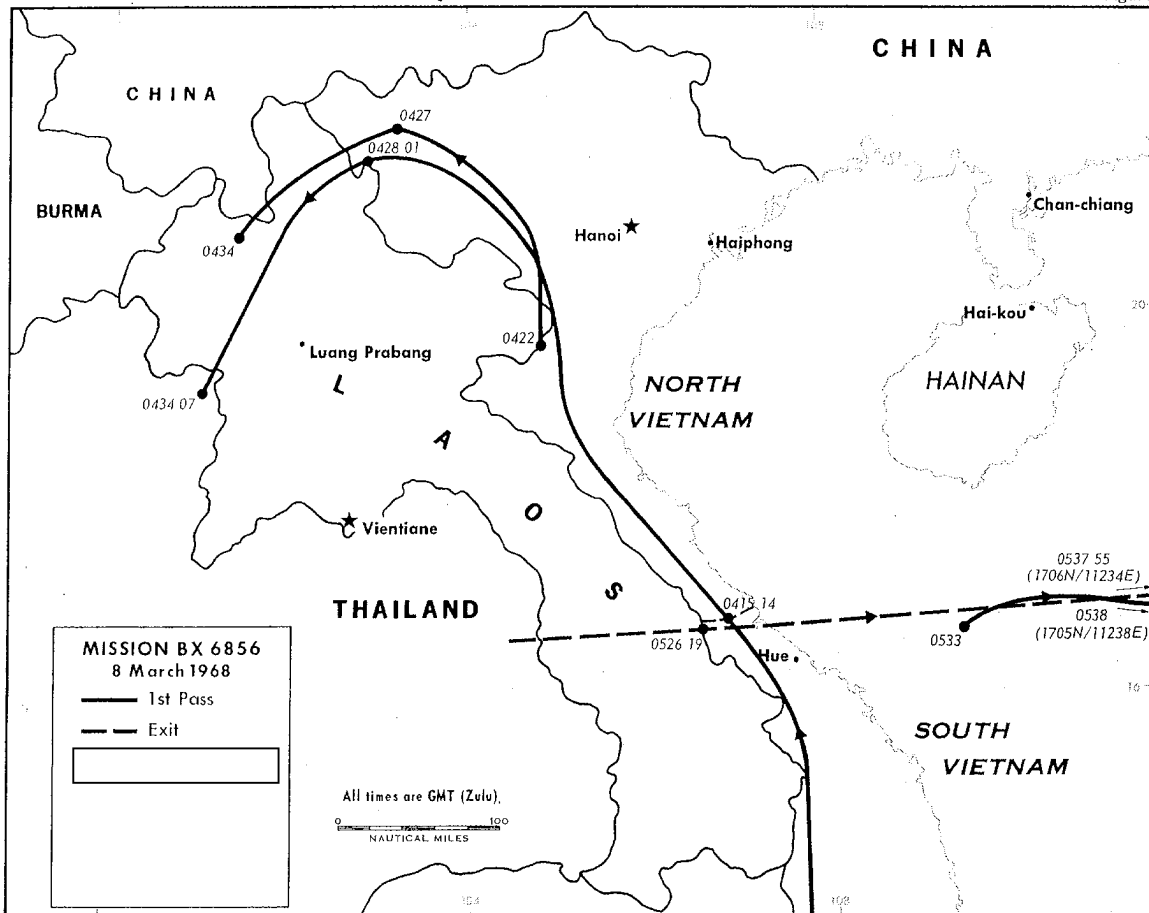
BX6856

This BLACK SHIELD two-pass mission was flown over North Vietnam and the Demilitarized Zone on 8 March 1968. The mission vehicle entered North Vietnamese airspace on its first pass at 0415:14Z and exited at 0428:01Z. On the second pass it overflowed the DMZ area in the time period from 0526:14Z to 0527:10Z. Figure 8 is a presentation of the flight route and associated tracking.

Good quality photography was obtained of Khe Sanh and the Laos, Cambodia, and South Vietnamese border areas. No useable photography was obtained of North Vietnam due to adverse weather conditions.

There was no indication of a hostile weapons reaction, and no on-board defensive systems were activated.

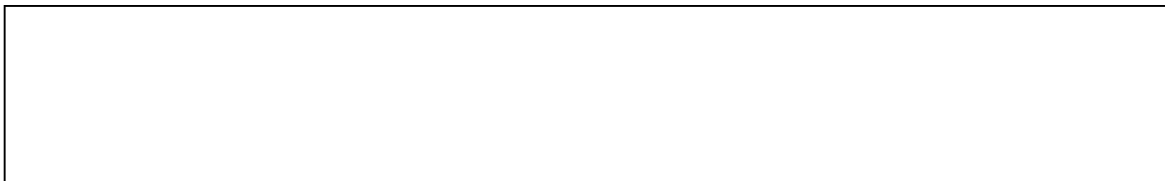
Figure 8



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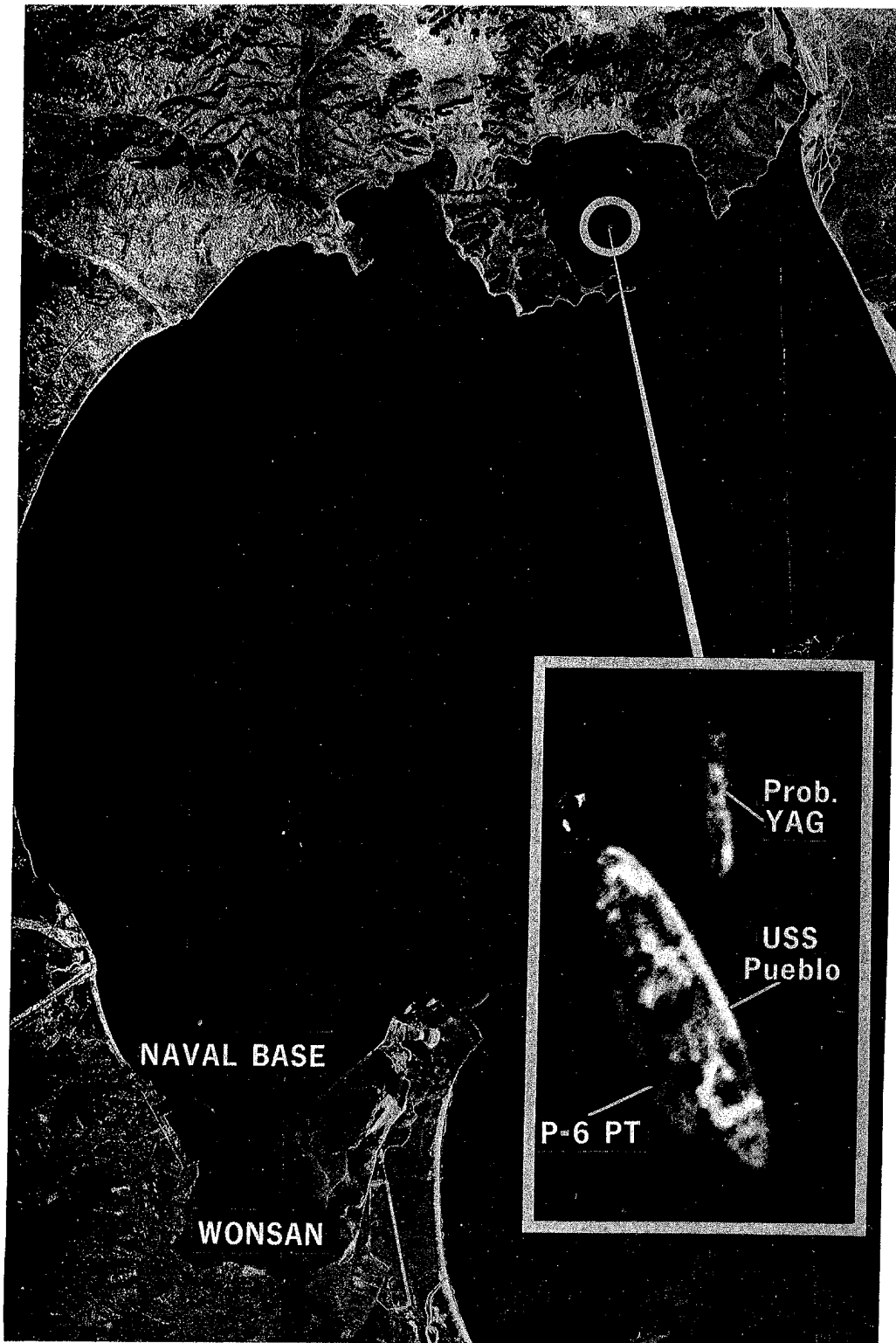
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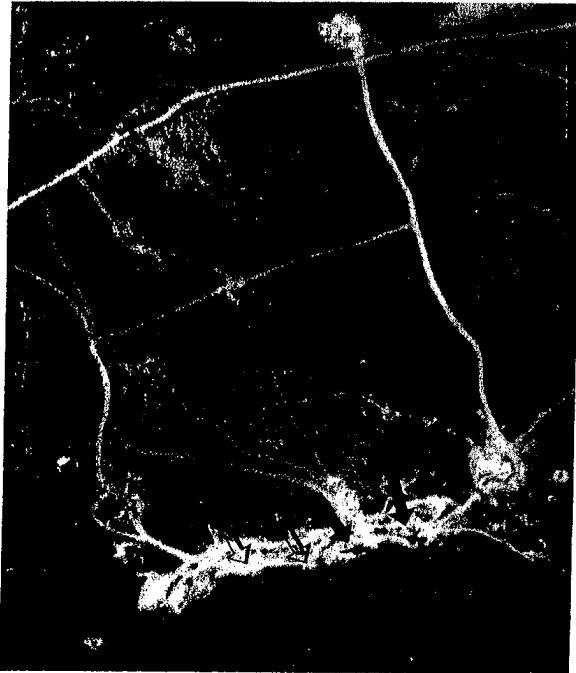
Little or no strike/jamming activity was conducted during the overflight period.

Figure 9.



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NO FOREIGN DISSEM
90199 4-68 CIA

Figure 10. Cave Defense Sites



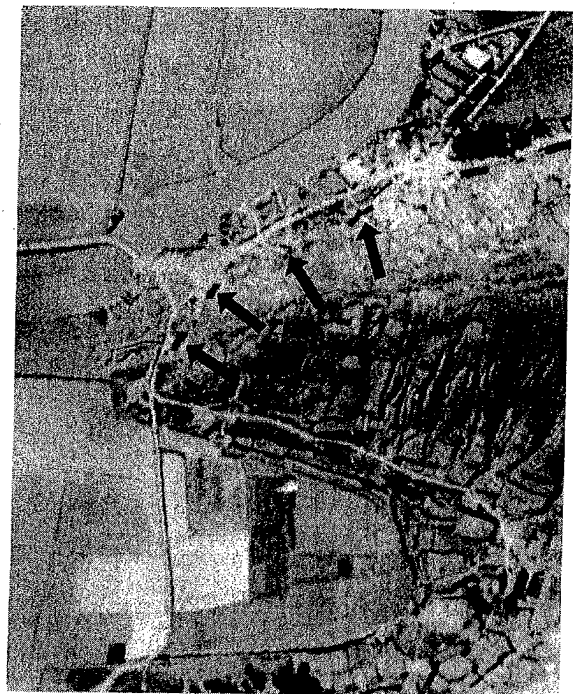
← Early-Stage Construction
← Initial-Stage Construction



← Early-Stage Construction



← Parapet



← Early-Stage Construction

Figure 11. Vinh Airfield



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~~NO FOREIGN DISSEM~~
4-68 CIA

APPENDIX I

BLACK SHIELD Operational Missions Alerted
Between 1 January and 31 March 1968

<u>MISSION NO.</u>	<u>DATE</u>	<u>REMARKS</u>
BX6842	3 Jan. 1968	Flown
BX6843	4 Jan. 1968	Flown
BX6844	6 Jan. 1968	Cancelled due to weather
BX6845	19 Jan. 1968	Cancelled due to weather
BX6846	20 Jan. 1968	Cancelled due to weather
BX6847 (Korea)	25 Jan. 1968	Flown (3 Passes)
BX6848	29 Jan. 1968	Cancelled due to weather
BX6849	9 Feb. 1968	Cancelled due to weather
BX6850 (Korea)	14 Feb. 1968	No Approval
BX6851	15 Feb. 1968	Flown
BX6852	16 Feb. 1968	Cancelled due to weather
BX6853 (Korea)	18 Feb. 1968	Flown
BX6854	27 Feb. 1968	Cancelled due to weather
BX6855	5 Mar. 1968	Cancelled due to weather
BX6856	7 Mar. 1968	Flown

APPENDIX II

COMIREX Targets Covered by BLACK SHIELD Missions over North Korea
1 January - 31 March 1968

COMIREX
Number

Target

Mission Number
47 53



X		
	X	X
X		
X		X
X		
X		
X		X
X		X
X		X
X		X
X		
X		X
X		

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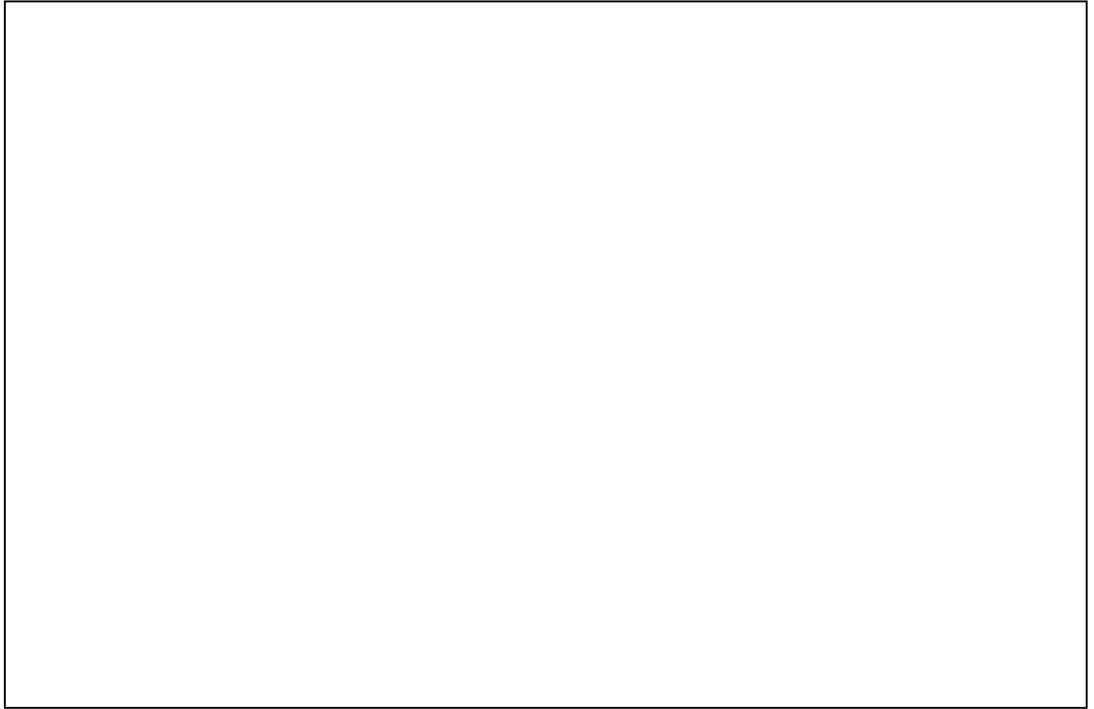
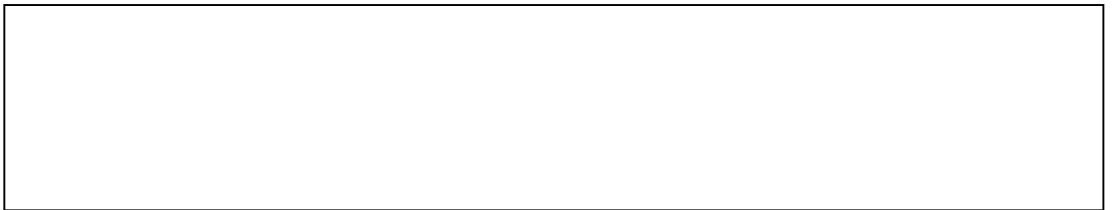
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APPENDIX II (continued)

COMIREX
Number

Mission Number
47 53

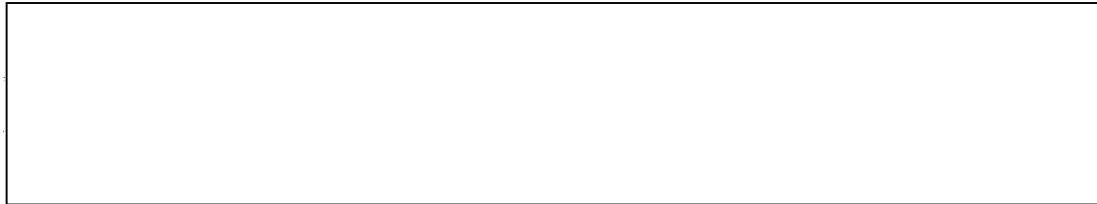
Target



X	X
X	X
X	X
X	X
X	X
X	X
X	X
X	X
X	X

APPENDIX II (continued)

COMIREX
Number



Target



Mission Number
47 53

X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	X	X	X	X		X	X	X		X	X				X	X		X

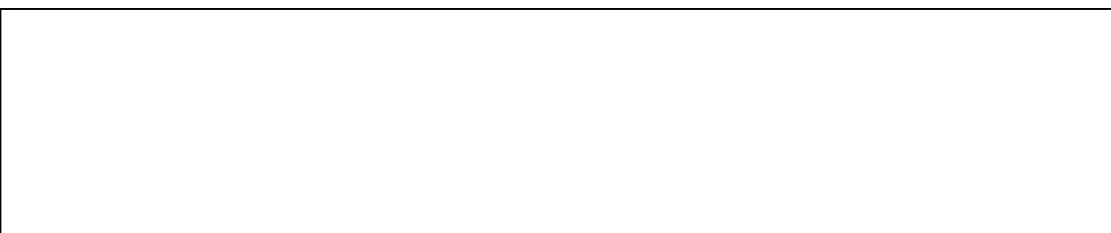


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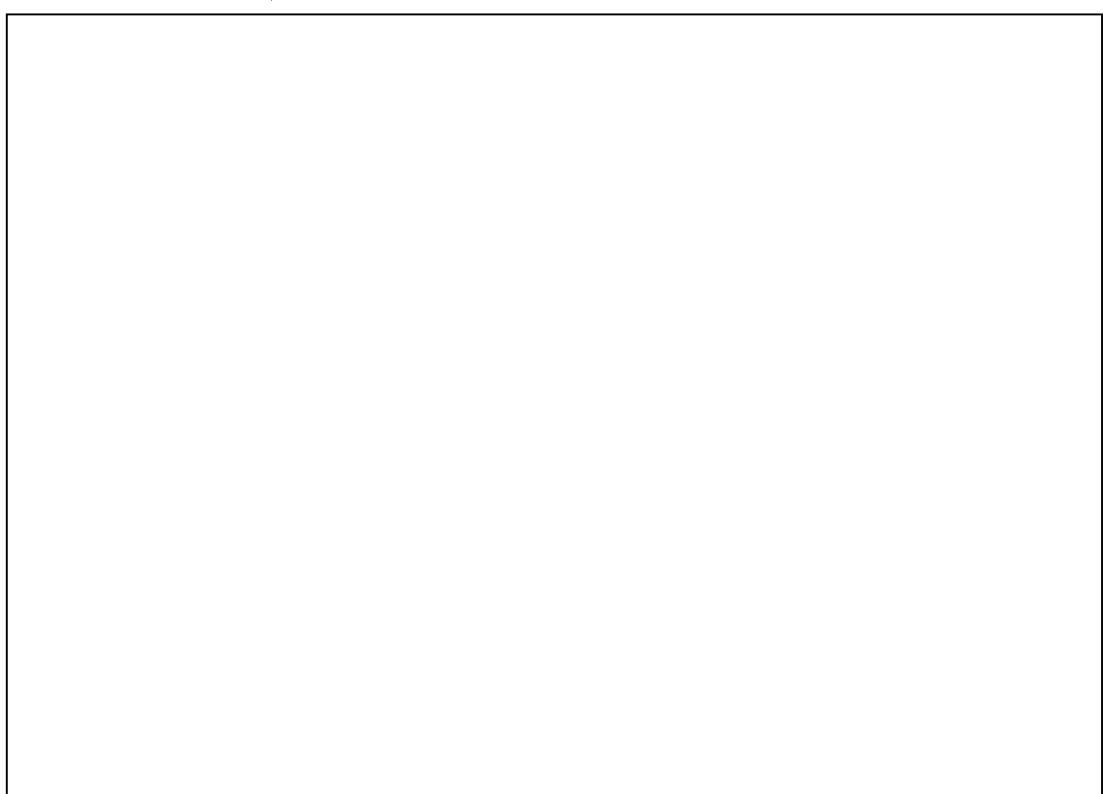
BYE-1330/68

APPENDIX II (continued)

COMIREX
Number



Target



Mission Number
47 53

X X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

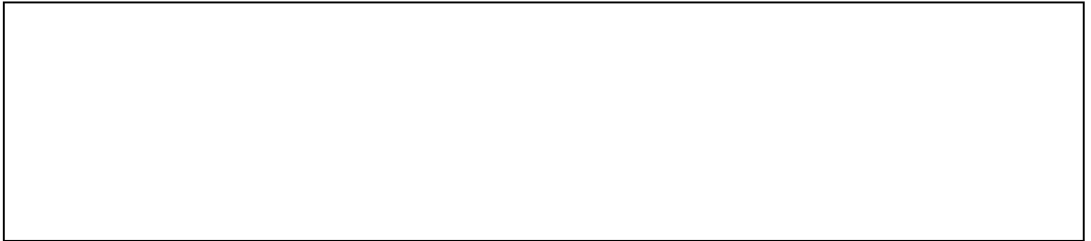
X

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BYE-1330/68

APPENDIX II (continued)

COMIREX
Number



Target



Mission Number
47 53

X

X

X

X

X

X

X

X

X

X

X

X

X

X

X

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APPENDIX II (continued)

<u>COMIREX Number</u>	<u>Target</u>	<u>Mission Number 47</u>	<u>Mission Number 53</u>
			X
		X	X
			X
			X
		X	
		X	X
			X
		X	X
			X
		X	
			X

APPENDIX III

COMIREX Targets Covered by BLACK SHIELD Missions over North Vietnam*
1 January - 31 March 1968

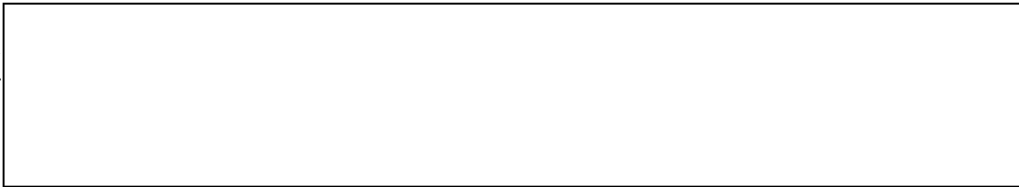
<u>COMIREX Number</u>	<u>Target</u>	<u>Mission Number</u>
[Redacted]	Hanoi SAM Search	42
	Lao Cai SAM Search	43
	Dien Bien Phu SAM Search	
	Vinh SAM Search	
	[Redacted]	X
	[Redacted]	X
	Hanoi SAM Site A-10-2	X
	[Redacted]	X

*Bad weather precluded photography of targets on BLACK SHIELD Missions BX6851 and BX6856.

APPENDIX III (continued)

COMIREX
Number

		Mission Number	
		42	43
	Hanoi SAM Site A-19-2	X	X
	Hanoi SAM Site A-29-2	X	X
	Hanoi SAM Site B-04-2	X	X
	Hanoi SAM Site B-12-2	X	X
	Hanoi SAM Site B-25-2		X
	Hanoi SAM Site B-29-2	X	X
	Hanoi SAM Site B-30-2	X	X
	Hanoi SAM Site C-29-2	X	X
	Hanoi SAM Site C-30-2	X	X
	Hanoi SAM Site D-19-2		X
	Hanoi SAM Site B-17-2		X
	Hanoi SAM Site B-21-2		X
	Hanoi SAM Site C-28-2	X	X
	Hanoi SAM Site D-31-2	X	X
	Hanoi SAM Site A-11-2	X	X
	Hanoi SAM Site A-24-2	X	X



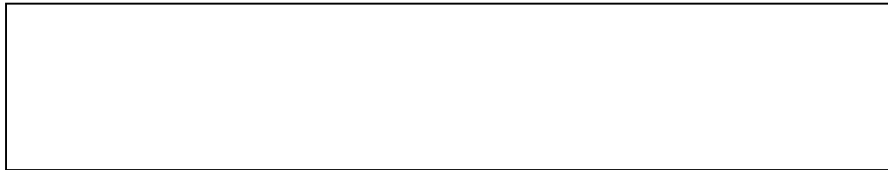
APPENDIX III (continued)

<u>COMIREX Number</u>	<u>Target</u>	<u>Mission Number</u>
	Hanoi SAM Site D-31A-2	42
	Hanoi SAM Site D-16-2	43
	Hanoi SAM Site D-36-2	X
	Hanoi SAM Site C-06-2	X
	Hanoi SAM Site C-07-2	X
	Hanoi SAM Site D-31B-2	X
	Hanoi SAM Site E07-2	X
	Yen Bai SAM Site B-09-2	X
	Yen Bai SAM Site C-09-2	X
	Haiphong SAM Site A-29-2	X
	Haiphong SAM Site A-20-2	X
	Haiphong SAM Site A-17-2	X
	Haiphong SAM Site B-01-2	X
	Haiphong SAM Site A-29A-2	X

APPENDIX III (continued)

COMIREX
Number

Target		Mission Number	
		42	
		43	
	Yen Bai SAM Site B-12-2	X	X
	Yen Bai SAM Site C-10-2	X	X
	Yen Bai SAM Site B-11-2	X	X
	Yen Bai SAM Site C-03-2	X	X
	Yen Bai SAM Site C-07-2	X	X
	Yen Bai SAM Site C-09A-2		
	Yen Bai SAM Site C-17-2	X	X
	Yen Bai SAM Site B-06-2	X	X
	Yen Bai SAM Site C-04-2	X	X
	Yen Bai SAM Site B-05-2	X	X
	Yen Bai SAM Site B-06A-2	X	X
	Yen Bai SAM Site B-10-2	X	X
	Yen Bai SAM Site B-11A-2	X	X



APPENDIX III (continued)

COMIREX
Number

Target

Mission Number
42 43



	Haiphong SAM Site B-33-2	X	X
	Haiphong SAM Site B-06-2	X	X
	Haiphong SAM Site C-32-2		X
	Haiphong SAM Site C-32A-2	X	X
	Haiphong SAM Site B-28-2	X	X
	Haiphong SAM Site B-30-2	X	X
	Haiphong SAM Site A-07-2	X	X
	Haiphong SAM Site A-23-2	X	
	Haiphong SAM Site A-31-2	X	
	Haiphong SAM Site A-33-2	X	

APPENDIX III (continued)

<u>COMIREX Number</u>	<u>Target</u>	<u>Mission Number 42</u>	<u>Mission Number 43</u>
	Haiphong SAM Site C-30-2	X	X
	Haiphong SAM Site C-28-2	X	X
	Haiphong SAM Site A-02-2	X	X
	Haiphong SAM Site A-17A-2	X	
	Haiphong SAM Site D-35-2	X	X
	Haiphong SAM Site A-33A-2	X	
	Thanh Hoa SAM Site B-28-2		X
	Thanh Hoa SAM Site C-02-2		X
	Thanh Hoa SAM Site B-01-2		X
	Thanh Hoa SAM Site B-02-2		X
	Thanh Hoa SAM Site		
	Thanh Hoa SAM Site D-04-2		X
	Thanh Hoa SAM Site C-03-2		X
	Thanh Hoa SAM Site C-02A-2		X
	Thanh Hoa SAM Site A-17-2		X

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APPENDIX III (continued)

COMIREX
Number

Mission Number
42 43

Target

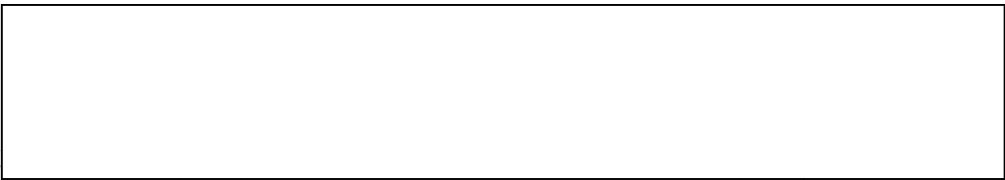
	Thanh Hoa SAM Site C-04-2	X
	Thanh Hoa SAM Site D-02-2	X
	Thanh Hoa SAM Site C-01-2	X
	Thanh Hoa SAM Site D-03-2	X
	Thanh Hoa SAM Site D-03A-2	X
	Thanh Hoa SAM Site A-19-2	X
	Thanh Hoa SAM Site B-28A-2	X
	Thanh Hoa SAM Site B-27-2	X
	Thanh Hoa SAM Site A-14-2	X
	Thanh Hoa SAM Site D-20-2	
	Thanh Hoa SAM Site D-20A-2	
	Thanh Hoa SAM Site A-17A-2	X
	Thanh Hoa SAM Site A-13-2	X
	Hanoi SAM Site D-04-2	

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APPENDIX III (continued)

COMIREX Number	Target	Mission Number 42	Mission Number 43
	Hanoi SAM Site C-30E-2	X	X
	Hanoi SAM Site B-30A-2	X	X
	Hanoi SAM Site C-30A-2	X	X
	Hanoi SAM Site D-03-2	X	X
	Hanoi SAM Site D-04-2	X	X
	Hanoi SAM Site A-17A-2	X	X
	Hanoi SAM Site C-30C-2	X	X
	Hanoi SAM Site C-01-2	X	X
	Hanoi SAM Site C-05-2	X	X
	Hanoi SAM Site C-04-2	X	X
	Hanoi SAM Site C-02-2	X	X
	Hanoi SAM Site C-04A-2	X	X
	Hanoi SAM Site C-01A-2	X	X
	Hanoi SAM Site B-33-2	X	X
	Hanoi SAM Site D-35-2	X	X
	Hanoi SAM Site C-06A-2	X	X



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APPENDIX III (continued)

<u>COMIREX Number</u>	<u>Target</u>	Mission Number 42	Mission Number 43
	Hanoi SAM Site C-13-2	X	
	Hanoi SAM Site C-11-2	X	X
	Hanoi SAM Site C-12-2	X	X
	Hanoi SAM Site C-30D-2	X	X
	Hanoi SAM Site B-07-2	X	X
	Hanoi SAM Site D-06-2	X	X
	Hanoi SAM Site C-30E-2	X	X
	Hanoi SAM Site B-34-2	X	X
	Bac Can SAM Site C-22-2	X	X
	Bac Can SAM Site B-20-2	X	X
	Bac Can SAM Site C-20-2	X	X
	Bac Can SAM Site C-19-2	X	X
	Hoa Binh SAM Site A-19-2	X	X
	Hoa Binh SAM Site B-20-2	X	X
	Hoa Binh SAM Site B-22-2	X	X
	Hoa Binh SAM Site B-17-2	X	X



APPENDIX III (continued)

COMIREX
Number

Mission Number
42 43

Target



Hoa Binh SAM Site C-17-2	X
Hoa Binh SAM Site B-19-2	X
Hoa Binh SAM Site D-27-2	
Hoa Binh SAM Site D-28-2	
Hoa Binh SAM Site A-04-2	
Hoa Binh SAM Site B-08-2	X
Hoa Binh SAM Site C-27-2	
Hoa Binh SAM Site B-02-2	X
Hanoi B-08-2	X
Hoa Binh SAM Site B-04-2	X
Hoa Binh SAM Site B03-2	X
Hoa Binh SAM Site B-08B-2	X
Hoa Binh SAM Site B-10-2	X
Haiphong SAM Site D-35A-2	X

APPENDIX III (continued)

COMIREX
Number



<u>Target</u>	Mission Number 42	Mission Number 43
Haiphong SAM Site B-07-2	X	X
Haiphong SAM Site A-27-2	X	
Haiphong SAM Site B-34-2	X	X
Haiphong SAM Site B-01A-2	X	X
Haiphong SAM Site A-06-2	X	X
Haiphong SAM Site A-14-2	X	
Haiphong SAM Site B-06B-2	X	X
Haiphong SAM Site D-22-2	X	
Haiphong SAM Site C-21-2		
Haiphong SAM Site D-23-2		
Haiphong SAM Site B-27-2	X	X
Haiphong SAM Site A-31A-2		
Haiphong SAM Site A-14A-2	X	
Haiphong SAM Site C-29-2		
Haiphong SAM Site C-27-2	X	X
Haiphong SAM Site C-26-2	X	

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BYE-1330/68

APPENDIX III (continued)

COMIREX
Number

Mission Number
42 43

Target



Haiphong SAM Site B-25-2

X

Haiphong SAM Site A-29-B-2

X

Haiphong SAM Site A-26--2

X

Haiphong SAM Site A-22-2

X

Haiphong SAM Site A-25A-2

X

Vinh C-19-2

X

Vinh C-32-2

Vinh B-16-2

Vinh

Vinh

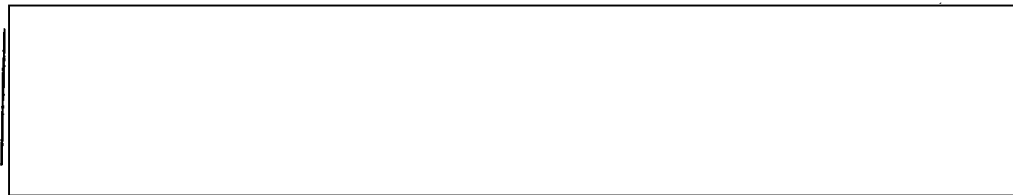
Vinh

Vinh C-32-2

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APPENDIX III (continued)

COMIREX
Number



Mission Number
42
43

Target

Vinh		
Vinh D-32-2		
Vinh A-07-2		X
Vinh		
Vinh C-32A-2		X
Vinh C-30-2		X
Vinh C-32B-2		X
Vinh B-21-2		
Vinh B-29-2		X
Vinh B-32-2		X
Vinh A-01-2		
Vinh A-36-2		
Vinh A-11-2		X
Vinh C-31-2		X
Vinh A-01A-2		X
Vinh D-35-2		X

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APPENDIX III (continued)

COMIREX
Number

COMIREX Number	Target	Mission Number 42	Mission Number 43
	Vinh C-31A-2		X
	Vinh A-25-2	X	X
	Hanoi SAM Site B-01-2	X	X
	Hanoi SAM Site C-33-2	X	X
	Hanoi SAM Site B-01A-2	X	X
	Hanoi SAM Site A-33-2	X	X
	Hanoi SAM Site D-36A-2	X	X
	Hanoi SAM Site C-01B-2	X	X
	Hanoi SAM Site A-01-2	X	X
	Hanoi SAM Site C-03-2	X	X
	Hanoi SAM Site C-03A-2		X
	Hanoi SAM Site A-14-2	X	X
	Hanoi SAM Site C-32-2	X	X
	Hanoi SAM Site B-32-2	X	X
	Hanoi SAM Site B-07A-2	X	X
	Hanoi SAM Site C-17-2		X

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~~TOP SECRET TRINE OXCART~~

APPENDIX III (continued)

COMIREX
Number

COMIREX Number	Target	Mission Number
	Hanoi SAM Site A-31-2	42 X
	Hanoi SAM Site C-17A-2	X
	Hanoi SAM Site B-16-2	X
	Hanoi SAM Site E-22-2	X
	Hanoi SAM Site C-17B-2	X
	Thanh Hoa SAM Site C-03A-2	X
	Thanh Hoa SAM Site B-01A-2	
	Thanh Hoa SAM Site C-01A-2	
	Thanh Hoa SAM Site C-04A-2	
	Thanh Hoa SAM Site D-21A-2	X
	Thanh Hoa SAM Site B-01B-2	X
	Thanh Hoa SAM Site D-21B-2	X
	Thanh Hoa SAM Site A-17B-2	X
	Thanh Hoa SAM Site D-21-B	X
	Hanoi SAM Site C-16-2	X



~~TOP SECRET TRINE OXCART~~

APPENDIX III (continued)

COMIREX
Number



Mission Number
42 43

COMIREX Number	Target	Mission Number 42	Mission Number 43
	Hanoi SAM Site A-05-2	X	X
	Hanoi SAM SITE B-36B-2		
	Hanoi SAM Site C-03B-2	X	X
	Hanoi SAM Site D-31C-2		
	Hanoi SAM Site C-05B-2	X	X
	Hanoi SAM Site B-27-2	X	X
	Hanoi SAM Site B-13-2	X	X
	Hanoi SAM Site B-28-2	X	X
	Hanoi SAM Site B-04A-2	X	X
	Hanoi Prob. Site A		
	Hanoi Prob. Site B		
	Hanoi SAM Site C-01D-2	X	X
	Hanoi SAM Site C-01E-2	X	X
	Hanoi SAM Site C-29A-2	X	X
	Hanoi SAM Site B-34A-2	X	X
	Hanoi SAM Site D-35-2	X	X

APPENDIX III (continued)

COMIREX
Number

Mission Number
42 43



Target

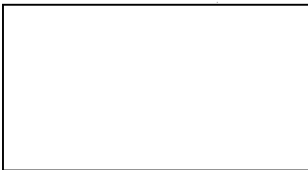
Vinh SAM Site A-01A-2			
Hanoi SAM Site A-15-2	X	X	
Hanoi SAM Site A-34-2	X	X	
Hanoi SAM Site B-36-2	X	X	
Hanoi SAM Site B-30B-2	X	X	
Hanoi SAM Site A-29-A	X	X	
Hanoi SAM Site A-34-A	X	X	
Hanoi SAM Site A-22-2	X	X	
Hanoi SAM Site A-15A-2	X	X	
Hanoi SAM Site A-32-2	X	X	
Hanoi SAM Site A-30-2	X	X	
Hanoi SAM Site A-24A-2			X

APPENDIX III (continued)

COMIREX
Number

Mission Number
42 43

Target



Vinh SAM Site A-25-2

Hanoi Probable SAM Equipment Training Area

Nan San SAM Site A-12-2

Nan San SAM Site C-12-2

Nan San SAM Site D-13-2

Hanoi SAM Site

Hanoi SAM Site A-01A-2

Hanoi SAM Site A-35-2

Hanoi SAM Site B-23-2

Hoa Binh SAM Site D-27-2

Haiphong SAM Site A-25-2

Haiphong SAM Site B-36-2

Haiphong SAM Site A-16-2

Haiphong SAM Site A-02A-2

Haiphong SAM Site

Thanh Hoa SAM Site D-31B-2

*			
*		X	X
*			
*			
*			
*			
*		X	X
*			
*		X	X
*			
*			
*			

*Unnumbered.

~~TOP SECRET TRINE OXCART~~

APPENDIX III (continued)

COMIREX Number	Target	Mission Number
*	Ban Xom Lom SAM Site	42
*	[Redacted]	43
	Hai Kou Airfield	X
	Ling Shui Airfield	X
	Meng Tzu Airfield West	X
	Haiphong/Cat Bi Airfield	X
	Haiphong/Kien An Airfield	X
	Hanoi/Bac Mai Airfield	X
	Hanoi/Gia Lam Airfield	X
	Phuc Yen Airfield	X
	Lang Son Airfield	X
	Kep Airfield	X
	Ning Ming Airfield	X
	Chia Lai Shih Airfield	X
	Ping Yuan Chieh Airfield	X
	Tien Yang Airfield	X

*Unnumbered.

~~TOP SECRET TRINE OXCART~~

APPENDIX III (continued)

COMIREX Number	Target	Mission Number 42	Mission Number 43
[Redacted]	Yen Bai Airfield	X	X
[Redacted]	Hoa Lac Airfield	X	X
[Redacted]	Bai Thuong Airfield (2C0987)	X	X
*	Tho Khoi Helicopter Dispersal Area		
*	Kep Ha Airfield		
*	Hanoi Helicopter Dispersal Area		
*	Hoa Lac Helicopter Dispersal Area	X	X
[Redacted]	That Khe Air Facility		
[Redacted]	Pei Hai Naval Facility		
[Redacted]	Hsin Hsing Naval Facility		
[Redacted]	Port Wallut Naval Base	X	X
[Redacted]	Haiphong Naval Base and Port Facilities	X	X
[Redacted]	Cam Qha Port Facilities		
[Redacted]	Pai Lung Port Facilities		X

*Unnumbered.

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APPENDIX III (continued)

COMIREX
Number

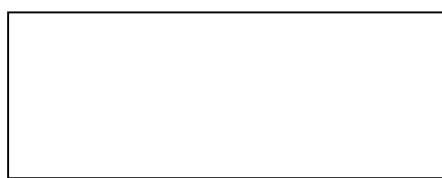


Mission Number
42
43

COMIREX Number	Target	Mission Number
	Cam Pha Port Facilities	X
	Hon Gai Port Facilities	X
	Ha Tou Shipyard	X
	Ben Thuy Coastal Transport Point	X
	Pei Li Port Facilities	X
	Lam Dong Naval Dispersal Facility	X
	Swatow PGM-Hanoi Area	
	Thanh Hoa BW/CW Research Facility	
	Lai Chau Complex	
	Ma Li Po Supply Depot	
	Mengtso Military Complex	
	Ping Hsing Ammunition Depot	X
	Ping Hsing Army Depot	X
	Ping Hsing Military Storage East	X

*

*



*Unnumbered.

APPENDIX III (continued)

COMIREX
Number

Mission Number
42 43

Target

	Ping Hsiang Storage Area North	X	X
	Chin Ping Infantry Division Headquarters A Barracks	X	X
	Chin Ping Supply Depot NW	X	X
	Ban Lot A Barracks		
	Ha Giang Military Area	X	X
	Van Hoi Military Areas	X	X
	Wen Shan Army Barracks West		
	Ho Kou Army Barracks North	X	X
	Yen Shan Military Barracks and Storage Area		
	Lang Son Army Barracks		X
	Y Son Ammunition Depot		
	Xom Hau A Army Supply Depot	X	X
	Ngoc Thi Barracks Supply Depot		
	Tai Xouan Army Barracks, Nam Vu		
	Loc Binh Army Supply Depot	X	X

APPENDIX III (continued)

COMIREX Number	<u>Target</u>	Mission Number 42	43
	Yen Bai Ordnance Depot	X	X
	Thai Nguyen Army Supply Depot North	X	
	Liu Tiao Pan Army Supply Depot		X
	Bac Can Barracks A Supply Depot		X
	Bac Giang Military Areas	X	X
	Mai Li Po Supply Depot		X
	Tung Chia Army Barracks		
	Ban Tchepone/NVN Special Area 1916	X	X
	Ba Binh Special Area 2009	X	X
	Ben Than Special Area 2013	X	X
	Vinh An Special Area 2014	X	X
	Vit Thu Lu/NVN Special Area	X	X
	Ha Huang tien Highway U.C.		X
	Tsi Ti Pao Road		
	Wu Pu Chieh Road Construction		
	Hanoi/Lao Cai Railroad Segment 2	X	X

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APPENDIX III (continued)

COMIREX Number	Target	Mission Number	
		42	43
	Hanoi/Lao Cai Railroad Segment 1	X	X
	Hanoi/Lao Cai Railroad Segment 3	X	X
	Hanoi/Ping Hsiang Railroad Segment 2	X	X
	Hanoi/Ping Hsiang Railroad Segment 1	X	X
	Hanoi/Ping Hsiang Railroad Segment 3	X	X
	Hanoi/Lao Cai Railroad Segment 4	X	X
	Hanoi/Lao Cai Railroad Segment 5	X	X
	An Cap Railroad Hanoi Thai Nguyen	X	X
	Ping Hsiang/Hanoi Railroad Segment 4	X	X
	Ho Kou Highway Segment, Route 24A	X	X
	Uong Bi Transformer Power Plant		
	Tien Pao Highway Sec., Route 25A		
	Chen Nan Kuan Highway Sec.		X
	Ping Hsiang Complex	X	X
	Wen Shan Complex		
	Dong Dang Railroad Yard	X	X

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APPENDIX III (continued)

COMIREX
Number



	<u>Target</u>	<u>Mission Number</u> 42	<u>Mission Number</u> 43
	Phu Lang Thuong Complex	X	X
	Cao Bang Military Complex	X	X
	Lai Chau Complex	X	X
	Lang Son Complex	X	X
	Mon Cai Complex	X	X
	Tien Yen Complex	X	X
	Binh Lu Area		
	Tuyen Quang Complex	X	X
	Yen Bai Complex	X	X
	Dien Bien Phu Complex	X	X
	Kep Complex		
	Lao Cai Complex	X	X
	Haiphong Railroad Station Classification Yard		
	Haiphong Railroad Station Classification Yard and Shops	X	X
	Viet Tri Railroad Yard	X	X

APPENDIX III (continued)

COMIREX
Number

[Redacted]

*

[Redacted]

Mission Number
42 43

<u>Target</u>	
Yen Vien Railroad Classification Yard	X X
Thai Nguyen Rail Activity	
Kep Railroad Yard	X X
Highway Segment 10E	
Haiphong Highway Bridge	
Van Diem Battery Plant	
Hanoi Railroad - A Highway Bridge	
Haiphong Warehouse Area Port	
Van Diem Vehicle Depot	
Hai Duong Railroad Siding West	
Hai Duong Railroad Station	
Hgoc Kuyet Railroad Station	
Ta Xa PPS North	
Loi Dong Warehouse Area	
Railroad Segment R-3-A	

*Unnumbered.

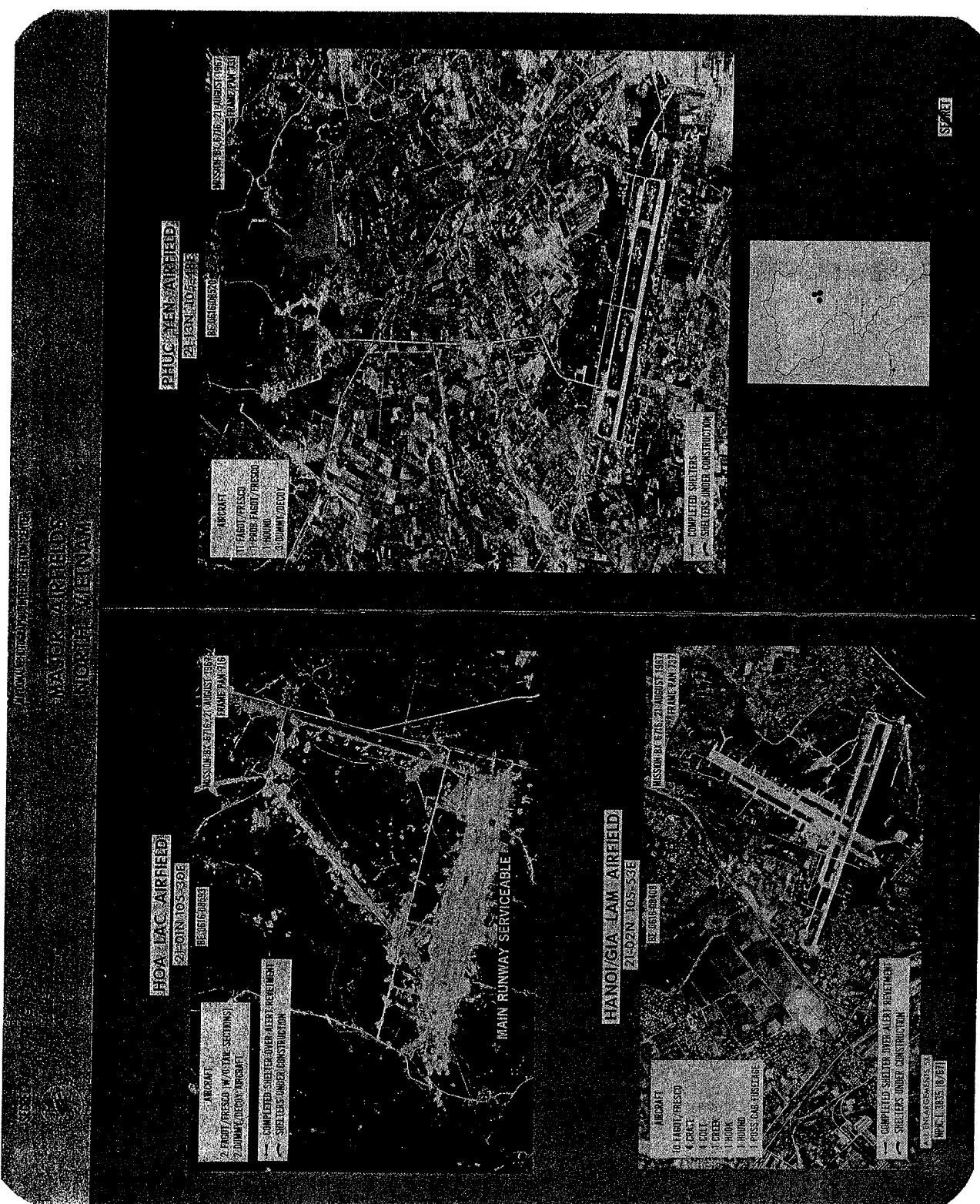


Figure 25

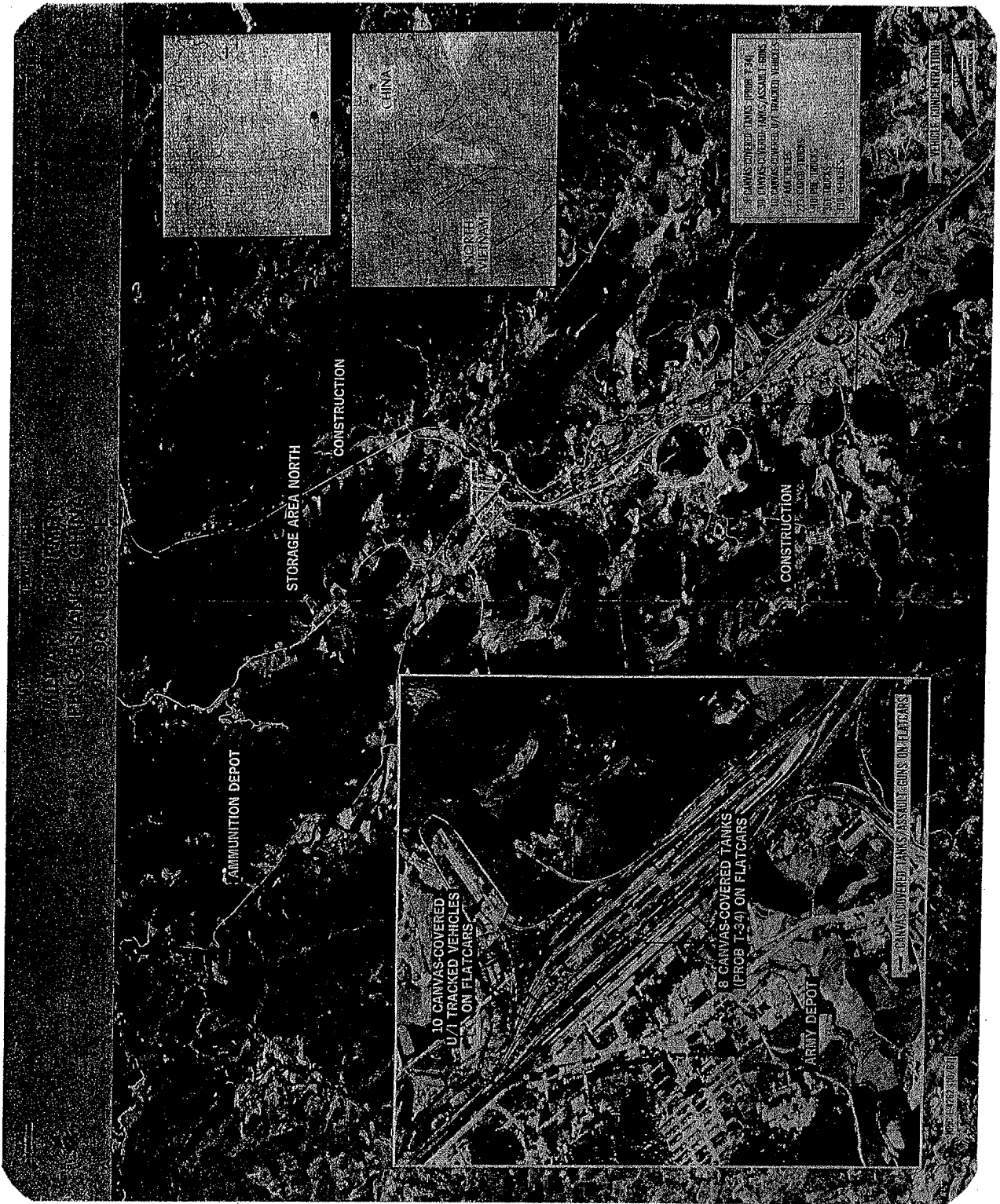


Figure 26

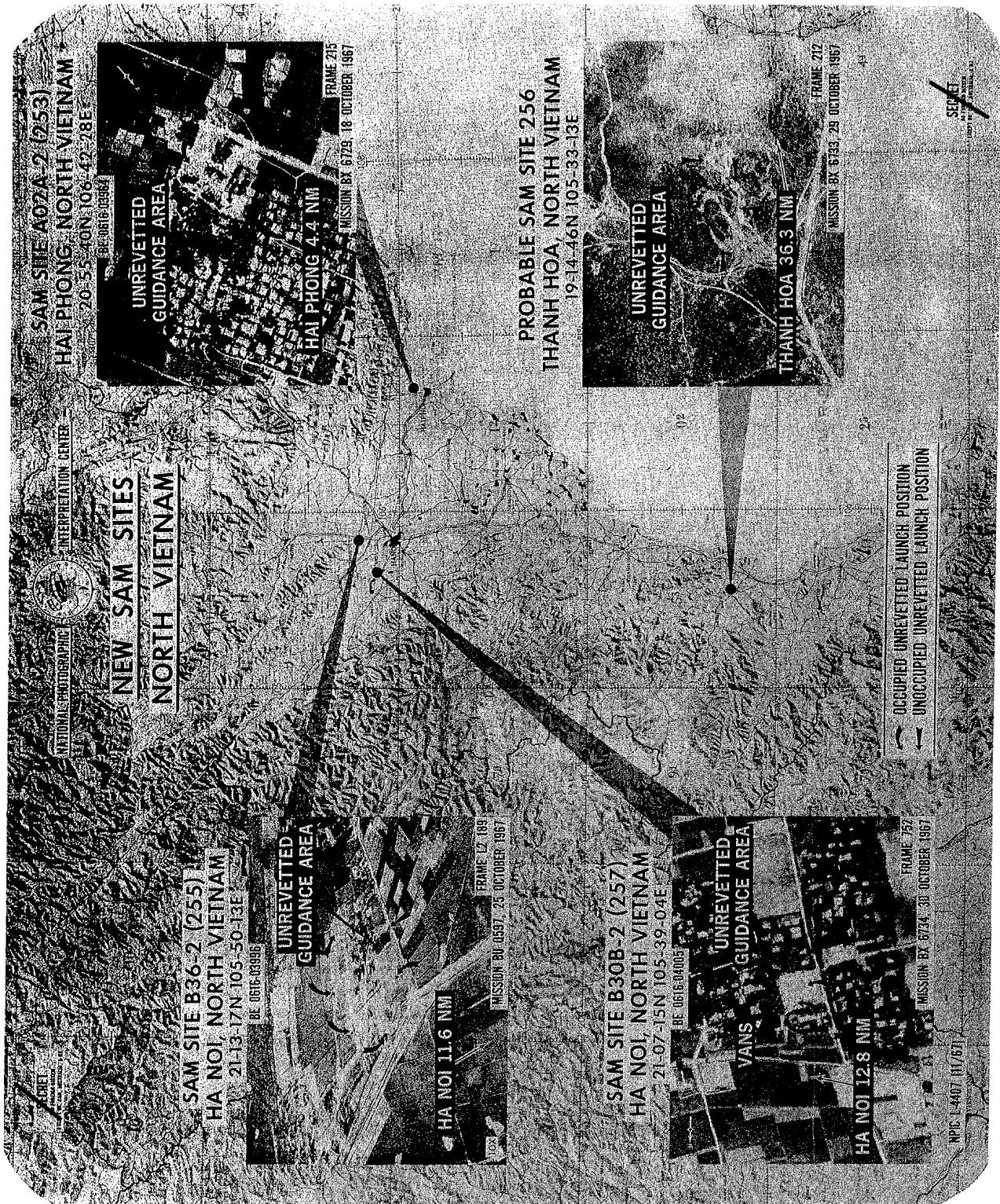


Figure 27



Figure 28

APPENDIX III (continued)

COMIREX
Number

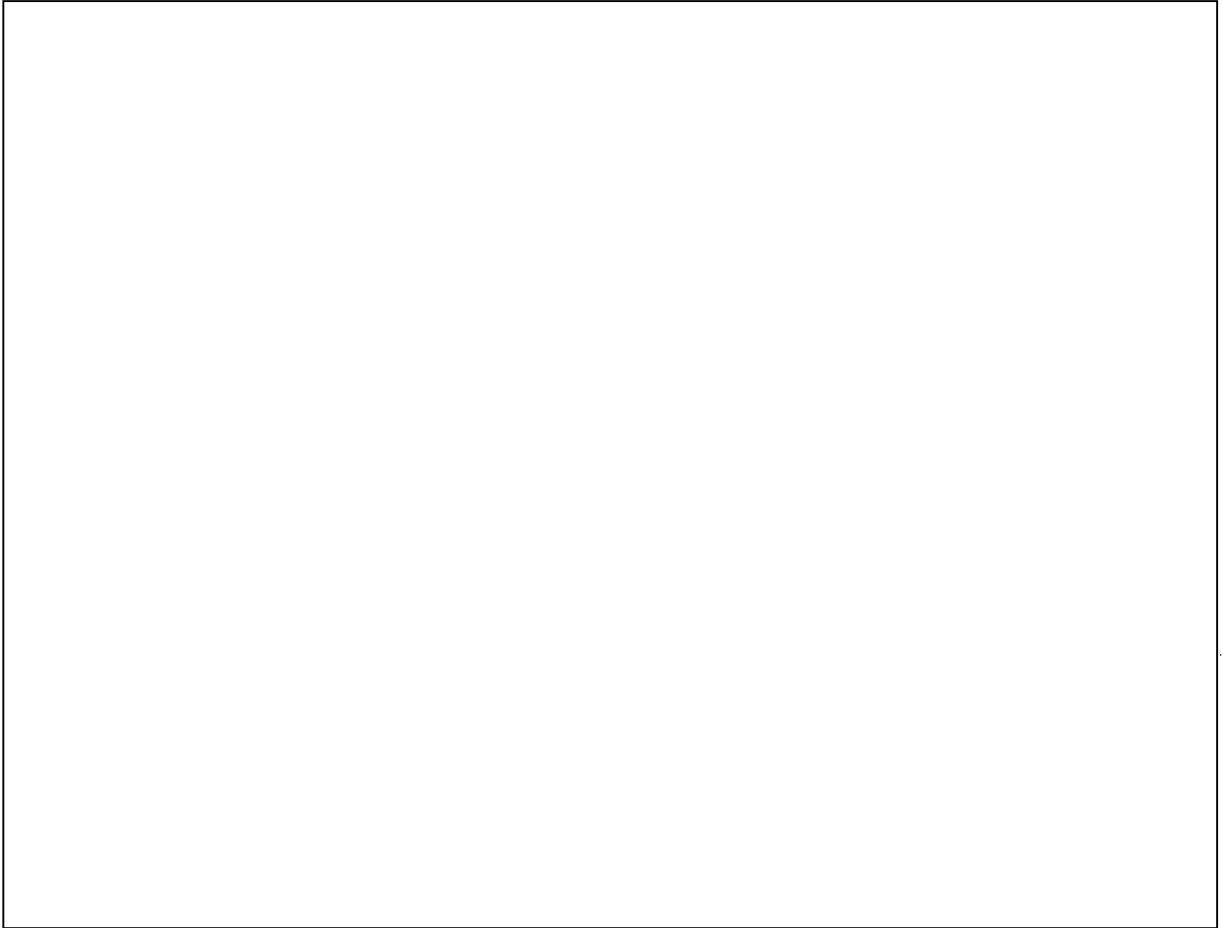
Target

Mission Number
42
43

- * Ping Hsiang Railroad Transporting Yard Station and Shops
- * Ho Kou Vehicle Park
- * Hsia Shih Storage Areas
- * Ping Hsiang Storage Area
- * Thai Nguyen Unidentified Construction Activity
- * Hanoi/Haiphong Railroad
- * Hanoi/Haiphong Railroad
- * Hanoi Transformer Power Plant
- * Haiphong Transformer Power Plant East
- * Haiphong Transformer Power Plant West
- * Viet Tri Transformer Power Plant
- * Hon Gai Transformer Power Plant
- * Bac Giang Transformer Power Plant

*Unnumbered

APPENDIX IV



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BYE-1367/68

EO 12958 3.3(b)(1)>25Yrs

BLACK SHIELD Reconnaissance Missions
1 April - 9 June 1968

DST-BS/BYE/68-3
7 August 1968

CENTRAL INTELLIGENCE AGENCY

Directorate of Science and Technology

APPROVED FOR RELEASE
DATE: AUG 2007

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PREFACE

This report is the last of a series of resumes of the BLACK SHIELD reconnaissance program flown over North Vietnam and North Korea. This final report spans the period from 1 April to 9 June 1968. Only North Korean missions were flown during this time period.

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BX6858	2

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II. COMIREX targets covered by BLACK SHIELD missions, 1 April - 9 June 1968	6
III. 	8

FIGURE

Mission BX6858, flown 5 May 1968	3
--	---

BLACK SHIELD Reconnaissance Missions
1 April - 9 June 1968


SUMMARY

Two BLACK SHIELD high-altitude reconnaissance missions were alerted during the period from 1 April to 9 June 1968. One mission was flown over North Korea. Approval was not granted for the other North Korean mission. (Appendix I lists these missions and related events).


Photography of BLACK SHIELD mission BX6858 flown over North Korea on 5 May 1968, although hampered by clouds and heavy haze, revealed no significant changes in North Korean military posture or disposition. Coverage of the DMZ, transportation, and infiltration routes disclosed no significant troop build-ups or logistic movements. (COMIREX targets photographed over North Korea are listed in Appendix II.



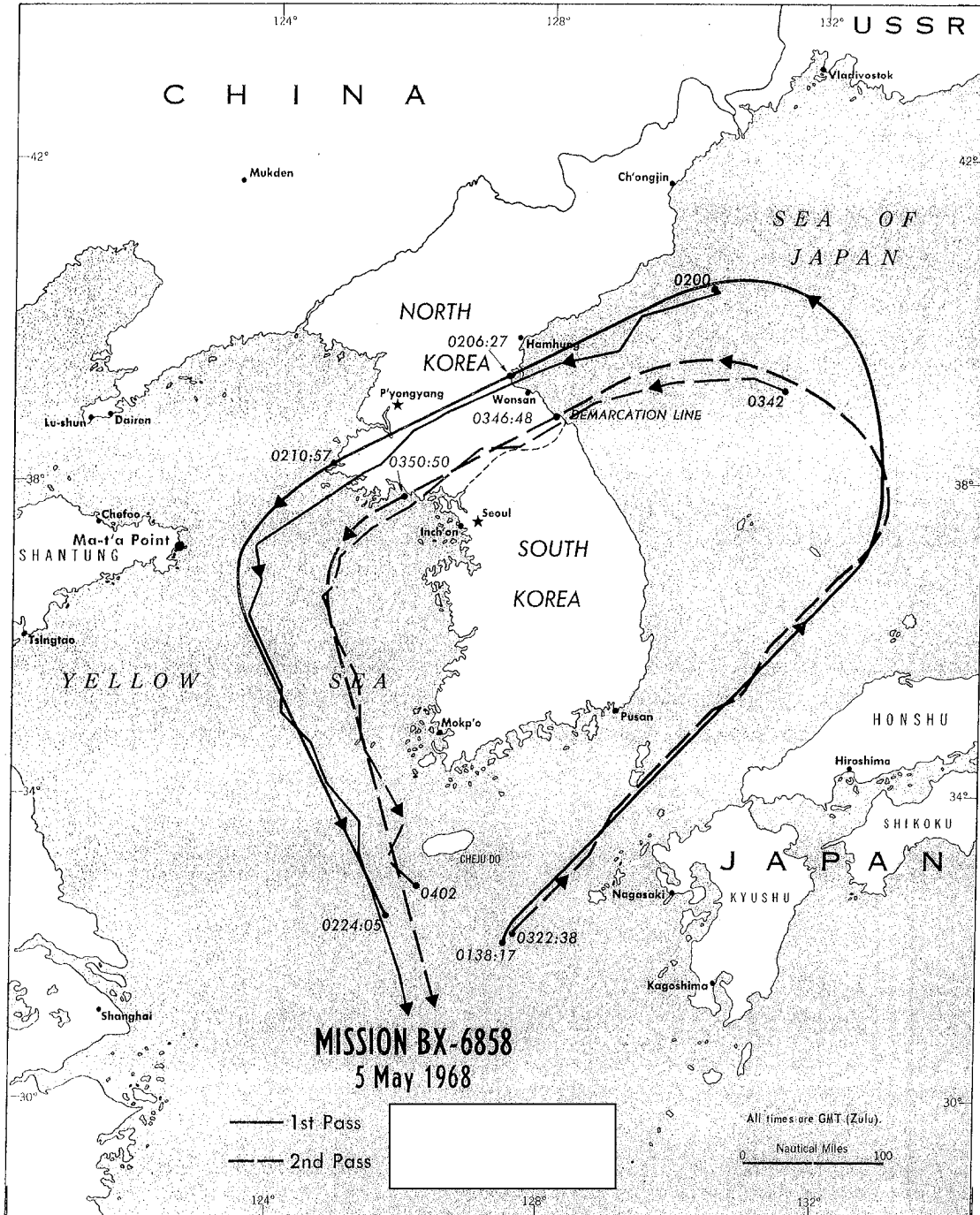
MISSION ANALYSIS

BX6858 was a double-pass, high-altitude reconnaissance mission flown over North Korea on 5 May 1968. The BLACK SHIELD vehicle entered and exited North Korean airspace on its first pass at 0206:27Z and 0210:57Z, and its second pass at 0346:48Z and 0350:50Z. Figure 1 shows the flight route 

Interpretability of mission photography was severely hampered by cloud cover and heavy haze. The mission aircraft photographed 68 COMIREX targets plus 30 bonus targets. Of the targets photographed, 15 were SA-2 sites. Three of the SA-2 sites were occupied, one was unoccupied, and eleven were identified only. A possible SAMLET coastal defense cruise missile site was tentatively identified on the east coast between Wonsan and Ham hung. Existing weather conditions in the target area did not permit the photographing of the USS Pueblo.



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APPENDIX I

BLACK SHIELD Operational Missions Alerted Between
1 April and 9 June 1968

<u>Mission No.</u>	<u>Date</u>	<u>Remarks</u>
BX6857	27 Apr. 1968 (Korea)	Cancelled-no approval
BX6858	5 May 1968 (Korea)	Flown

APPENDIX II

COMIREX Targets Covered by BLACK SHIELD Mission BX6858
5 May 1968

COMIREX NO.

TARGET

<u>COMIREX NO.</u>	<u>TARGET</u>
--------------------	---------------

COMIREX NO.

TARGET

--

APPENDIX III

