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MISSION # 37 KUALA LUMPUR "BANDOG"
19 February 1945

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AIR FORCE
Chief of Staff
Deputy C. of S. P & A
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Deputy C. of S. T. M. & M.

XX Bomber Command

Tactical Mission Report

No. 37

Date 19 FEBRUARY 1945

GENERAL OF THE ARMIES H. H. ARNOLD

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TWENTIETH AIR FORCE
Office of the Deputy Commander, IB and C
APO 493

TACTICAL MISSION REPORT

Field Orders No. 37 — Mission No. 37

TARGET: CENTRAL R.R. REPAIR SHOPS,
KUALA LUMPUR, MALAYA.

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Prepared By:

Intelligence Section,
XX Bomber Command

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TWENTIETH AIR FORCE
Office of the Deputy Commander, IB and C
APO 493

10 March 1945

SUBJECT: Report of Operations, 19 February 1945.

TO : Commanding General, Twentieth Air Force, Washington, 25, D.C.

1. UNITS PARTICIPATING: Two Bombardment Groups of the XX Bomber Command were directed by Field Orders Number 37 to participate in a daylight attack on the Central Railroad Repair Shops, Kuala Lumpur, Malaya. A force composed of 60 aircraft, 30 from each group, was to take part. Groups, their locations, and their Commanding Officers were as follows:

Group	Base	Commanding Officer
444th	Dudhkundi	Colonel A.L. Harvey
468th	Kharagpur	Colonel J.V. Edmundson

2. IDENTIFICATION OF MISSION:

a. Attack No. 37.

b. Targets Specified:

(1) Primary Target: Central Railroad Repair Shops, Kuala Lumpur, Malaya (AAF Target No. 92.1-56).

(2) Secondary Target: Alor Star Airfield, Malaya (AAF Target No. 92.1-1).

(3) Last Resort Target: Railroad Marshalling Yard, Martaban, Burma (XX Bomber Command Target No. 82.2-K).

3. STRATEGY AND PLAN OF OPERATIONS:

a. Importance of Targets Actually Attacked:

(1) Primary Target: The Central Railroad Repair Shops at Kuala Lumpur comprise a large and well equipped center for the maintenance of the entire Malayan rail system and are the only shops of any consequence on the whole peninsula. All repairs except those of a minor nature are accomplished here. In addition, the shops manufacture car bodies and assemble locomotives from imported parts. Since this target is the only installation of its kind in Malaya, its destruction or damage by air attack will have appreciable effect upon the railroad system. Lack of maintenance and repair will decrease the efficiency of this system and reduce Japanese capability to move troops and supplies between Singapore and points in Thailand and Indo-China.

(2) Secondary Target: The Alor Star Airfield, Malaya, although of no outstanding strategic importance, was selected as a secondary target in view of the shortage of suitable secondary targets in the area. Although located at a considerable distance up the peninsula it was to serve as an expedient in order to prevent jettisoning the bomb load in the event that the primary target was cloud covered. Destruction

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or damage to planes, equipment, hangers and personnel would unquestionably result in further reducing the capabilities of the Japanese to maintain and protect their Malayan position.

(3) Last Resort Target: Ferries carrying goods and personnel ply between the railroad jetties and yards at Martaban, Burma, and those at Moulmein, thus bridging the gap in the Burma - Thailand RR caused by the Salween and Gyaing Rivers. There is thus a railroad terminal at both towns for the reception of rolling stock and there are also warehouses for storing supplies waiting trans-shipment. The rail yards at Martaban are currently very active, reflecting present events in Burma. On recent photo cover an average of over 100 cars has been observed at Martaban; on 1 January 1945 there were 140 cars in the yards, and on 4 January, 116. Destruction of rolling stock and facilities at Martaban would further complicate Japanese problems of supply and of retreat from Burma.

b. Details of Planning:

(1) Operational Planning:

(a) In planning this mission the first difficulty was encountered in selecting a suitable target. The Singapore dry docks and other installations in that area and the Penang Island area had been deleted by the Supreme Allied Commander, SEAC as targets for the XX Bomber Command. As the central railroad repair shops at Kuala Lumpur was available as a target, it was decided to direct a medium task force against it.

(b) A medium size force of 60 planes was considered sufficient to destroy the target. It was decided to call upon the 444th and the 468th Groups for 30 aircraft each and not to call upon the 40th or the 462nd for any aircraft for the strike force.

(c) No suitable secondary targets were available in the immediate vicinity, and as the radar aspects of the primary target were extremely poor it was decided to designate Alor Star Air Field as the secondary target. The railroad marshalling yards at Martaban, Burma, was selected as the last resort target.

(d) During the period between the date that plans for the mission were being completed and D-day, several attempts were made to obtain photographs of the target and radar scope pictures from the IP to the target. Radar pictures were obtained, and K-17 photographs of Kuala Lumpur and the immediate target vicinity were taken. However, the target itself was not successfully photographed.

(e) The tactical plan called for each group to be given a time to leave the assembly point instead of a time over target. Bombing by three plane formations was specified due to the anticipated lack of opposition and in order to give more crews the experience of leading a formation.

(f) As both Groups used the same assembly point a time interval of 30 minutes between the lead formations of the Groups to leave the assembly point was specified. The 444th Group was to assemble at 10,000 feet and the 468th at 12,000 feet, and it was contemplated that an interval of 3 minutes would occur between the formations which would produce a steady stream of three plane formations over the target.

(g) It was decided to send a weather reconnaissance plane, carrying a Wing Commander, over the target area prior to the arrival

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of the strike force at the assembly point. The Wing Commander was to designate the best visual altitude for bombing, between 10,000 and 20,000 feet, based on the cloud cover over the target, and this information was to be transmitted over liaison 30 minutes prior to the time the first formation was to leave the assembly point, and at stated intervals thereafter to insure maximum reception.

(2) Determination of Bomb Load:

(a) Structural analysis of the vital units within the target area, particularly the boiler shop, the smithy, the erecting shop, the locomotive iron store building, and the traverser, which is the principle means of traverse communications for heavy material in the area, let to the recommendation for the use of 1000-pound G.P. bombs, fused for .1 second nose and .025 second tail delay. The attack was directed at destroying machines and equipment within the buildings rather than hoping to achieve this end as a secondary result of spreading collapse, which might have been caused by bombs with a shorter delay detonating just below the roof. Released from 20,000 feet true altitude at a true air speed of 300 mph. a 1000-pound G.P. bomb, either the AN-M65 or AN-M64, will have a striking velocity of approximately 1025 feet per second. Depending upon deceleration caused by the roofs and the actual variation if fuse-functioning time, this fusing will permit the bombs to detonate approximately 19 - 32 feet below the point of entry. If conditions over the target dictate bombing from altitudes lower than those specified in the field orders, detonation will still take place within the structures, but at slightly higher levels. Since there is no evidence of compartment aligation within the more important structures, destruction and damage to machinery and equipment will be maximized by bombs detonating well within these units.

(b) Similarily, the bomb and fusing will be most effective in cratering the traverser, as well as maximizing the incidental destruction inflicted upon the rolling stock, railroad right of way, and the marshalling yards located adjacent to the locomotive repair shops.

(c) The original suggestion that the high explosive attack directed at the vital components be followed up with an M-17 Incendiar attack with a view toward neutralizing the numerous combustible structures in the area, as well as increasing the extent of damage and length of time required to reconstruct the repair facilities, was not considered practical in view of the operational difficulties involved.

(3) Bombing Data:

(a) The bomb load for each aircraft in the attacking force was specified as a minimum of six 1000-pound G.P. bombs, fused .1 second nose and .025 second tail delay.

(b) Bombing was to be accomplished from 18,000 feet pressure altitude by the 444th Group and from 20,000 feet pressure altitude by the 468th Group, unless the Wing Commander in the weather scout aircraft, which was to precede the Groups over the target, designated a more favorable altitude.

(c) Aircraft were to bomb in three plane formations, releasing bombs in minimum train on the range and deflection sighting of the leader. The axis of attack was to be 131° magnetic, and the aiming point was the southeast corner of building No. 2, which contained both the boiler shop and the smithy.

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4. EXECUTION OF THE MISSION (See Annex A):

a. Take-Off:

(1) Times of take-off were not specified in the Field Orders, but were left to the discretion of the Group Commanders. A departure time for each Group to leave the assembly point was specified.

(2) Take-off was accomplished as follows:

Group	A/C Scheduled for Take-off	A/C Airborne	First A/C Off	Last A/C Off
444th	30	30	1755Z	1859Z
468th	30	29	1902Z	2025Z
Total	60	59	1755Z	2025Z

(3) Visibility at bases on take-off was from 4 to 5 miles. Wind calm at Dudhkundi; at Kharagpur, wind was variable SE to NE at 5 mph in a light rain.

b. Route Out:

(1) The route out was from base to common assembly point at Rawi Island to the initial point at 04°01'N - 100°43'E to the target.

(2) There were 9 deviations from the planned route to the primary target. Of these, 3 aircraft bombed the secondary target, 1 aircraft bombed the last resort target, 4 aircraft (altogether in one formation) bombed a target of opportunity, and 1 aircraft jettisoned its bombs and returned to base after 44 minutes of flight.

c. Primary Target:

(1) Of the 59 aircraft airborne, 49 were over the primary target with their bomb loads and all are credited with bombing. A total of 346 M-65 G.P. bombs (176.36 short tons) were dropped on this target. The first formation was over the target at 0249Z and was composed of 3 planes. It was followed by 14 formations of from 2 to 5 aircraft, and 1 aircraft which bombed singly. The last formation over the target bombed at 0415Z.

(2) Bombing altitudes ranged from 11,000 feet indicated to 13,700 feet indicated, for the lead aircraft of each formation. Headings varied from 265° to 140° magnetic.

(3) Cloud cover over the target consisted of 1/10 to 5/10 small cumulus with tops at 5000 feet, and 5/10 to 7/10 altostratus with base at 13,000 feet and tops at 14,000 feet. Visibility was 30 miles.

d. Secondary Target:

(1) Three aircraft (all 468th Group) bombed the secondary target; aircraft 417 at 0227Z from 16,800 feet, aircraft 272 at 0305Z from 13,900 feet, and aircraft 532 at 0313Z from 13,370 feet. A total of 24 M-65 (1000-pound) G.P. bombs were dropped, all visually.

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e. Last Resort Target:

(1) Aircraft 580 (444th Group) bombed the last resort target at 0205Z from 15,000 feet and dropped 6 M-65 G.P. bombs. Bombing was visual.

f. Targets of Opportunity:

(1) Malayan Collieries, Batu Arang, Malaya: Aircraft 730, 422, 273 and 524 (all 444th) bombed this target at 0247Z from 12,000 feet. Bombing was visual, and a total of 24 M-65 G.P. bombs were dropped.

g. Route Back:

(1) The return route was from the target area direct to home bases.

(2) Scattered clouds covered both bases, with visibility 8 miles. Wind was NE-NNE, 6 to 7 mph., at Kharagpur; calm at Dudhkundi.

5. ENEMY ANTIAIRCRAFT (See Annex B):

a. No enemy antiaircraft fire was encountered at any of the targets bombed on this mission, nor were there any reports of ground-to-air rockets, smokescreens, or barrage or high-altitude balloons.

b. Heavy antiaircraft was encountered at Penang South Airdrome (05°17'N - 100°16'E) and Georgetown, Penang (05°25'N - 100°21'E). Automatic weapons fire was encountered at Port Swettenbam (03°00'N - 100°25'E), Little Coco Island (14°00'N - 93°14'E) and Preparis Island (14°52'N - 93°40'E)

c. On the basis of early warning intercepts by RCM observers it is believed that the enemy had approximately 60 minutes prior warning of the attack.

6. ENEMY AIR OPPOSITION (See Annex C):

a. Air opposition was very weak, with a total of only 27 individual encounters. No B-29's were lost or damaged due to enemy fighter action. B-29's were opposed by an enemy force estimated at 15 aircraft, mostly obsolescent types such as Vals, Claudes and Nates. All encounters occurred in the primary target area. Preliminary claims against E/A were 1 destroyed and 7 damaged.

b. The high frontal approach was the favorite with Japanese pilots, although few of the attacks were aggressively pressed. Enemy pilots fired in only 33 per cent of the encounters while B-29's fired in 92 per cent. Aerial bombs were employed in 5 attacks, none resulting in damage to B-29's. Only 2 coordinated attacks were reported.

7. WEATHER (See Annex D):

a. Except for the fact that increased cumulus activity was encountered along the out going route the weather was essentially as forecast.

b. Metro winds were rated as fair.

8. COMMUNICATIONS (See Annex E):

a. Communications on this mission were generally very satisfactory. All aircraft received the message from the weather scout plane in sufficient time to effect the necessary change in bombing altitude.

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b. Excessive fading was experienced on the eight megacycle frequencies for the first time by this Command, and were especially noticeable when aircraft were over the target. It is believed that the low averag bombing altitude of 12,000 feet instead of the normal 20,000 feet was responsible. The twelve megacycle frequencies remained unaffected.

c. No distress traffic nor violations of cryptographic or transmission security were logged. No attempts at jamming on the part of the enemy were noted.

d. There were 11 malfunctions of equipment during flight. In 6 instances substitute measures were employed to resume operations. The remaining 5 were not repaired in flight.

e. Six D/F bearings were given with no unusual occurrences. One bearing to an aircraft approximately 900 miles from the D/F site proved accurate to within 2 degrees.

9. RADAR (See Annex F):

a. The target on this mission was primarily a visual target. The radar operator did assist considerably on the bombing run by the use of the radar- bombsight procedure and by directing the aircraft along the track to the target area by offsetting from the Malaya coastline. All bombing was visual.

b. Many scope photographs were received and a number traced the bombing run.

c. Operational serviceability of the radar systems was far above average. A total of fifty-four (54) systems or ninty-nine (99) per cent were operational over the target area.

10. RCM (See Annex G):

a. Five aircraft were equipped with RCM search equipment and monitored the early warning band en route to and from the target, and the radar fire control band while in the target area. A photo aircraft on the post strike mission was similarily equipped, and a study of the Japanese early warning net was made after the main force passed by.

b. The following radar sites were detected: Great Coco, Port Blair, Penang, Medan, Mergui, Moulmein (possible), and 2 possible ship-borne radar. The Great Coco - Port Blair and the Penang - Medan early warning nets were in operation.

c. Two NISEI radio operators participated in this mission, monitoring enemy fighter and fighter control frequencies.

11. CENTRAL STATION FIRE CONTROL AND GUNNERY (See Annex H):

a. Enemy air opposition on this mission was rated very weak, and, as a result, more ammunition was expended in test firing than in combat. Of a total of 275 turrets and 660 MG's on the mission there were 5 malfunctions of fire-control equipment and 4 malfunctions of MG's.

b. In regard to gunnery the mission is considered very satifactory. A total of 5590 rounds were expended in test firing, and 4710 in combat.

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12. CAMERAS AND PHOTOGRAPHS (See Annex I):

a. Thirty-six cameras of the K-18, K-20 and K-22 types were carried in aircraft airborne on the mission, and a total of 214 usable negatives obtained. One camera failed to photograph for mechanical reasons and 2 for other reasons.

13. LOSSES AND DAMAGE (See Annexes J and M):

a. There were no losses or damage of any kind on this mission.

14. FUNCTIONING OF EQUIPMENT (See Annexes K and M):

a. Of the 59 aircraft airborne, 2 failed to reach the target for mechanical reasons and 8 because of personnel error.

b. There were 47 additional mechanical malfunctions, none of which prevented aircraft from bombing the primary target. These are summarized as follows: power plant and accesory section - 4; propellors and governors - 3; oil system - 6; fuel system - 4; electrical system - 10; instruments - 18; and miscellaneous - 2.

c. Over-all averages in fuel consumption were: average - 6475 gallons; maximum - 6850 gallons; minimum - 6100 gallons. Averages by Groups were: 444th - 6520 gallons (maximum - 6850, minimum - 6250); 468th - 6435 gallons (maximum - 6700, minimum - 6100).

15. TARGET DAMAGE ASSESSMENT (See Annex L)

a. Damage assessment was based on good quality photos obtained by the 462nd Group on 27 February 1945.

b. Of an approximate total of 764,500 square feet of buildings comprising the plant, about 57.5 per cent suffered structural damage and nine percent superficial damage, for a total over-all damage to the works of approximately 67 per cent. Heaviest damage occurred in the northern two-thirds of the plant where virtually all the workshops are located.

c. In addition to the damage inflicted on the workshops, heavy damage occurred to trackage and rolling stock especially in the main marshalling area in the northern portion of the plant. Approximately 105 rolling stock and six locomotives were destroyed or damaged. Damage to the Administrative and Stores area and in the non-industrial area was slight.

R. M. RAMEY,
Brigadier General, U.S.A.
Deputy Commander

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ANNEX

A

EXECUTION OF THE MISSION

I - Information on Take-offs

II - Details of Routes

III - Track and Vertical Flight Path *

IV - Bombing Data **

V - Bomb Loading

VI - Disposition of Bombs

VII - Formations Flown

VIII - Navigation Report *

* Prepared by Staff Navigator

** Prepared by Staff Bombardier

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I - INFORMATION ON TAKE-OFFS

Mission No. 37

19 February 1945

Group	First A/C Off	Last A/C Off	Elapsed Time	No. of A/C Taking Off	Average Take-off Interval
444th	181755Z	181859Z	64 min.	30	128 sec.
468th	181902Z	182007Z	65 min.	29*	144 sec.
Over-all	181755Z	182007Z	132 min.	59	----

* Includes 2 late take-offs; A/C 532 at 182017Z and A/C 227 at 182025Z. Not included in computation of average take-off interval.

Note: Take-offs were on D-day minus 1, Z time.

II - DETAILS OF ROUTES

Mission No. 37

19 February 1945

A. Planned Routes

Base	444th Dudhkundi	468th Kharagpur
Assembly Point	Rawi Island (06°33'N - 99°13'E)	
Initial Point	Point (04°01'N - 100°43'E)	
Target	Kuala Lumpur R.R. Shops (03°11'N - 101°41'E)	
Base	Dudhkundi	Kharagpur

B. Deviations from Planned Routes

1. Aircraft Bombing Assigned Targets:

	444th	468th	Total
Bombed S.T.	-	3	3
Bombed L.R.T.	1	-	1
	1	3	4

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2. Aircraft Bombing Targets of Opportunity:

a. A/C 730, 422, 273, and 524 (all 444th) bombed the Malayan Collieries, Batu Arang, Malaya.

3. Aircraft Jettisoning Bombs:

a. A/C 891 (444th) returned early to base after 44 minutes of flight due to mechanical difficulty. Bombs were jettisoned.

4. Aircraft Landing at Other than Home Base:

a. A/C 375 (444th) landed at Chittagong, after bombing PT., due to magneto trouble.

b. A/C 272 (468th) landed at Chittagong, after bombing the SP., due to trouble with a prop governor and failure of bomb bay doors to close after bombs away.

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XX BOMBER COMMAND
TRACK & VERTICAL FLIGHT PATH
MISSION #37

DUDHKUNDI
444TH GP

KHARAGPUR
468TH GP

A.P.-BOTH GROUPS
RAWI IS.
06°-33' N.
99°-13' E.

I.P.
04°-01'
100°-43'

TARGET
03°-11' N.
101°-41' E.

ROUTE OUT
ROUTE BACK

THOUSAND FEET
16
12
8
4
0

13,000'
468TH GP.

11,000'
444TH GP.

21.57

75° 80° 85° 90° 95° 100° 105° 110° 115° 120°

20° 15° 10° 5° 0°

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HEADQUARTERS
XX BOMBER COMMAND
APO 493

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Auth: CG XX BC
Initials:
Date: 21 Feb 45

CONSOLIDATED SPECIALIST MISSION REPORT
OF STAFF BOMBING OFFICER

Date Prepared: 22 February 1945 Field Order Number 37

Date of Mission: 19 February 1945

1. The weather ship which preceded the formations over the primary target at Kuala Lumpur discovered a complete cloud layer with base at approximately 14,000 feet pressure altitude. Wing Commander therefore assigned the 444th Group a bombing altitude of 11,000 feet pressure altitude and the 468th Group a bombing altitude of 13,000 feet pressure altitude. All bombing was accomplished visually although cloud undercast over the target was variously reported from CAVU to 7/10 cloud cover.

2. Size of formations, varied from a single airplane to a five aircraft formation. A study of bomb plot analysis charts constructed from strike photographs reveals the 444th Group formations had 49% of all bombs plotted in the area within 1000 feet of the briefed aiming point and the 468th Group formations had 68% of all bombs plotted in the area within 1000 feet of the briefed aiming point. Collectively, the Command percentage for bomb impacts within 1000 feet of the aiming point is 60% of all bomb impacts plotted. Considering the fact that bombing was accomplished from a medium altitude by small formations, this figure would indicate poor bombing, but actually this figure is not an accurate index unless existing conditions over the target are known:

a. Intermittent cloud cover restricted length of bomb runs to from five to 180 seconds with 78 seconds being the average length of bomb run.

b. Incomplete and inaccurate target charts made it extremely difficult for Bombardiers to orient target or to pick-up aiming point once target was located.

c. Heavy smoke from bomb impacts restricted visibility of succeeding formations over the target. Surface winds also blew smoke toward the approaching formations thus further restricting visibility.

3. Five formations were forced to abandon the initial bomb run on the briefed axis of attack due to varying conditions explained in paragraph 2 above. Second bomb runs were made on approximate reciprocal headings without difficulty.

4. Each aircraft of the 444th Group carried six 1000-pound G.P. bombs. Each aircraft of the 468th Group carried eight 1000-pound G.P. bombs. Six bombs were carried in the rear bomb-bay on the conventional 1000-pound bomb stations. Two bombs carried in forward bomb-bay were suspended on the forward-most racks and the nose fuze was omitted, thus allowing the bomb

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sufficient release clearance. The loading arrangement was entirely satisfactory and no difficulty in releasing bombs was detected.

Reported malfunctions of bombing equipment for aircraft arriving over targets:

444th Group - None

468th Group - None

6. This mission is significant in that it is the first daylight attack performed by this Command at a medium altitude. Also, a definite advantage was gained from a training viewpoint, since it gave a maximum number of crews an opportunity to acquire the experience of leading a formation over a tactical target.

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V - BOMB LOADING

Mission No. 37

19 February 1945

Bomb Load per A/C M-65	444th A/C	444th M-65	468th A/C	468th M-65	Total A/C	Total M-65	Lbs. per A/C	Tons per A/C
6	30	180			30	180	6116	3.06
8			29	232	29	232	8155	4.06
Total	30	180	29	232	59	412	7118	3.70

Note: Weight of M-65 bomb (GP - TNT or Amatol) computed at 1019.4 pounds each. Bomb was fused .1 second nose and .025 second tail. Table based on all aircraft airborne.

VI - DISPOSITION OF BOMBS

Mission No. 37

19 February 1945

	444th A/C	444th M-65	468th A/C	468th M-65	Total A/C	Total M-65	Total Pounds M-65	Total Tons M-65
A/C bombing all tgts. and bombs dropped	28	168	29	232	57	400	407760	203.88
A/C over PT and bomb load carried	23	138	26	208	49	346	352713	176.36
A/C bombing PT and bombs dropped	23	138	26	208	49	346	352713	176.36
A/C bombing ST and bombs dropped	-	-	3-a	24	3-a	24	24466	12.23
A/C bombing LRT and bombs dropped	1-b	6	-	-	1-b	6	6116	3.06
A/C bombing T.O. and bombs dropped	4-c	24	-	-	4-c	24	24466	12.23
A/C jettisoning bombs	1-d	6	-	-	1-d	6	6116	3.06
A/C returning bombs	1-e	6	-	-	1-e	6	6116	3.06
Total	30	180	29	232	59	412	419992	210.00

a. A/C 417, 272 and 532 (468th) bombed Alor Star Airfield, Malaya.

b. A/C 580 (444th) bombed Railroad Yards, Martaban, Burma.

c. A/C 422, 273, 730 and 524 (444th) bombed Malayan Collieries, Batu Arang, Malaya.

d. A/C 891 (444th) jettisoned.

e. Bombs returned by A/C 897 (444th).

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VII - FORMATIONS FLOWN

Mission No. 37

19 February 1945

A. Formations Planned

Field Orders #37 called for bombing by three plane formations. The timing at the assembly point was planned to permit formations to leave at intervals of 3 minutes and thus produce a steady stream of three plane formations over the target. As both Groups used the same assembly point a time interval of 30 minutes was specified between the lead formations of the Groups to leave the assembly point.

B. Formations over Target

Formations are shown below as they were at the time of bomb release. Diagrams are intended to indicate relative position only. Individual statistics are those of the lead aircraft. "X" represents an aircraft of the 444th Group and "Z" the 468th Group. Note: All bombing was accomplished visually.

1. Aircraft over Primary Target

1st.

X 411

X 724 X 268

Time - 0249Z
Altitude - 12,000'I
Heading - 300°M

IAS - 190 mph
Bombs dropped - 18 M-65

2nd.

X 720

X 537 X 277

Time - 0302Z
Altitude - 11,000'I
Heading - 350°M

IAS - 190 mph
Bombs dropped - 18 M-65

3rd.

X 732

X 492 X 873

X 723

Time - 0307Z
Altitude - 11,000'I
Heading - 120°M

IAS - 190 mph
Bombs dropped - 30 M-65

4th.

Z 858

X 861 Z 678

Time - 0313Z
Altitude - 12,600'I
Heading - 125°M

IAS - 190 mph
Bombs dropped - 22 M-65

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5th. Z 895

Time - 0314Z
Altitude - 12,600'I
Heading - 130°M

IAS - 190 mph
Bombs dropped - 8 M-65

6th. X 559

X 507 X 451

X 376

Time - 0315Z
Altitude - 11,000'I
Heading - 130°M

IAS - 190 mph
Bombs dropped - 24 M-65

7th. Z 456

Z 534 Z 663

Time - 0318Z
Altitude - 12,500'I
Heading - 131°M

IAS - 190 mph
Bombs dropped - 24 M-65

8th. X 884

X 472 X 538

X 375

Time - 0321Z
Altitude - 11,000'I
Heading - 310°M

IAS - 190
Bombs dropped - 24 M-65

9th. Z 415

Z 276 Z 909

Z 691

Time - 0325Z
Altitude - 13,500'I
Heading - 130°M

IAS - 190 mph
Bombs dropped - 32 M-65

10th. Z 536

Z 424

Time - 0328Z
Altitude - 12,950'I
Heading - 265°M

IAS - 195 mph
Bombs dropped - 16 M-65

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By sm NARA Date 12/6/05

11th. X 899

X 270 X 533

Time - 0331Z
Altitude - 11,000'I
Heading - 132°M
IAS - 190 mph
Bombs dropped - 18 M-65

12th. Z 315

Z 500

Time - 0343Z.
Altitude - 10,400'I
Heading - 315°M
IAS - 190 mph
Bombs dropped - 16 M-65

13th. Z 445

Z 734 Z 719

Time - 0344Z
Altitude - 13,600'I
Heading - 128°M
IAS - 190 mph
Bombs dropped - 24 M-65

14th. Z 892

Z 529

Z 525

Time - 0352Z
Altitude - 13,050'I
Heading - 140°M.
IAS - 190 mph
Bombs dropped - 24 M-65

15th. Z 487

Z 486 Z 893

Time - 0353Z
Altitude - 13,000'I
Heading - 120°M
IAS - 190 mph
Bombs dropped - 24 M-65

16th. Z 542

Z 227 Z 714

Time - 0415Z
Altitude - 13,700'I
Heading - 111°M
IAS - 190 mph
Bombs dropped - 24 M-65

2. Aircraft over Secondary Target

A/C	Group	Time	Altitude	Heading	IAS	Bombs dropped
417	468th	0227Z	16,800'I	72° M	195	8 M-65
272	468th	0305Z	13,900'I	340° M	190	8 M-65
532	468th	0313Z	13,370'I	125° M	190	8 M-65

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By gu NARA Date 12/6/05

3. Aircraft over Last Resort Target

A/C	Group	Time	Altitude	Heading	IAS	Bombs dropped
580	444th	0205Z	15,000'I	75° M	190	6 M-65

4. Aircraft over Target of Opportunity

X 730

X 273 X 422

X 524

Time - 0247Z
Altitude - 12,000'I
Heading - 147°M

IAS - 190 mph
Bombs dropped - 24 M-65

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By sm NARA Date 12/6/05

SECRET

SECRET
AUTH: CG XX BC
Initials: CKW
Date: 21 Feb 45

HEADQUARTERS
XX BOMBER COMMAND
APO 493

CONSOLIDATED
SPECIALIST MISSION REPORT
OF STAFF NAVIGATION OFFICER

Date Prepared: 22 February 1945

Field Order Number 37
Date of Mission 19 Feb 45

1. No apparent navigation difficulties were encountered in the attack against the Central Railroad Work Shops at Kuala Lumpur Area. Navigation was excellent and a satisfactory amount of celestial work was accomplished. Considerable disparity between the intended time over target and actual time over target was evidenced. This may have been caused by encountering adverse winds.

a. Average navigation times out and back were as follows:

	NAV TIME OUT	NAV TIME BACK	ASSEMBLY TIME
444th Group	8h 38m	7h 28m	11m
468th Group	7h 58m	7h 6m	9m

b. The following navigational aid work was reported:

	CEL LOP'S	CEL FIXES	RADIO FIXES	QDMS
444th Group	112	60	0	0
468th Group	176	71	4	6

c. Forecast winds were fair for this mission. There are evidences of considerable disparity in actual winds reported, by individual navigators. Actual average winds were as follows:

	ONE HALF WAY BACK	TARGET	ONE HALF WAY BACK
444th Group	3000' 140°15K	11000' 125°18K	8000' 165°15K
468th Group	6000' 195°17K	13000' 141°17K	7000' 176°16K

d. Radar cooperation was satisfactory on this mission.

2. The use of an advance weather ship met with favor by the Groups, since it relieved the element of doubt as to target weather conditions.

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Authority NND 760063
By sw NARA Date 12/6/05

ANNEX

B

ENEMY ANTIAIRCRAFT

Prepared by:
Flak Officer
XX Bomber Command

DECLASSIFIED
Authority NND 760063
By sw NARA Date 12/6/05

S E C R E T

SECRET
By Auth of the C.G.
XX Bomber Command
22 Feb 45 [illegible]
Date Initials

HEADQUARTERS
XX BOMBER COMMAND
Intelligence Section
APO 493

22 February 1945

P R E L I M I N A R Y R E P O R T

ANTIAIRCRAFT OPPOSITION

MISSION NUMBER 37, (DAYLIGHT), 19 FEBRUARY 1945

Primary Target - KUALA LUMPUR, MALAYA, Secondary Target - ALOR STAR A/F, MALAYA, and Target of Last Resort - MARTABAN, BURMA

A. ANTIAIRCRAFT FIRE ENCOUNTERED

1. PENANG SOUTH AIRDROME (05°17'N - 100°16'E)

Meager and inaccurate black heavy antiaircraft fire was reported by one aircraft of a formation of 4 at 0200Z at 10,000 feet altitude through a 7/10 undercast. A total of 3 bursts, occurring individually, were observed. Deviations were above, behind and in line, and fire is believed to have been Continuously Pointed. No enemy aircraft were reported on the same course and altitude.

2. GEORGETOWN, PENANG (05°25'N - 100°21'E)

Meager and inaccurate black heavy antiaircraft fire was reported by 1 aircraft each (of a 4 plane formation) at 0210Z and 0240Z at 11,000 feet altitude, through 3/10 to 5/10 undercast conditions.

At 0210Z a total of 3 bursts, occurring simultaneously, were reported with deviations of above, below, and behind. Fire is believed to have been Barrage. At 0240Z one burst was observed above, ahead, and to the right. No enemy aircraft were reported on the same course and altitude at either time.

3. PORT SWETTENHAM (03°00'N - 100°25'E)

Meager and inaccurate automatic weapons fire was reported by 1 aircraft of a formation of 3 at 0405Z at 12,000 feet under 3/10 undercast conditions as originating from a gunboat near a freighter at PORT SWETTENHAM. Tracers were reported as blue and deviations as below, behind, and to the right.

4. LITTLE COCO ISLAND (14°00'N - 93°14'E)

Meager and inaccurate automatic weapons fire was encountered by two aircraft from this location. Both gun-flashes and tracers were observed.

5. PREPARIS ISLAND (14°52'N - 93°40'E)

Meager and inaccurate automatic weapons fire was encountered by 1 aircraft at 1130Z at 3,000 feet altitude. Black bursts and flashes could be seen approximately 1,000 feet below the aircraft in addition to 8 or 9 ground flashes.

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By sw NARA Date 13/6/05

B. ANTIAIRCRAFT FIRE ENCOUNTERED (Negative Reports)

1. KUALA LUMPUR (03°10'N - 101°42'E)

Forty-nine aircraft bombed the Central Railroad Repair Shops from 11,000 to 13,600 feet altitude from 0249Z to 0415Z under 3/10 to CAVU conditions but no antiaircraft opposition was encountered. Aircraft attacked this area in 17 formations generally consisting of 3 or 4 aircraft at an average interval of 5 to 6 minutes.

2. ALOR STAR AIRFIELD (06°05'N - 100°20'E)

Three aircraft bombed this area individually from 0227Z to 0313Z from 14,000 to 17,000 feet altitude under visual conditions, but no antiaircraft opposition was encountered.

3. MARTABAN - MOULMEIN (16°33'N - 97°36'E)

One aircraft bombed the MARTABAN Jetties and Yards at 0205Z from 15,000 feet altitude under CAVU conditions on a heading of 75 degrees, but no antiaircraft opposition was encountered.

4. BATU ARANG (03°17'N-101°30'E)

Four aircraft bombed this area from 12,000 feet at 0247Z under CAVU conditions, but no antiaircraft opposition was encountered.

C. GROUND-TO-AIR ROCKETS, SMOKESCREENS, BARRAGE and HIGH-ALTITUDE BALLOONS

None reported.

D. DAMAGE FROM ANTIAIRCRAFT FIRE

None.

E. WARNING NETS

As aircraft were tracked by early warning radar (as determined from R.C.M. intercepts) from the GREAT COCO-ANDAMAN Islands area, PENANG Island, and MEDAN, it is believed that the enemy had approximately 60 minutes prior warning.

Utilization of this warning may have been affected by previous attacks on SINGAPORE, but the existence of 2 enemy fighter attacks prior to 0249Z and 1 at 0250Z would indicate that the Jap was prepared to defend the KUALA LUMPUR Area. The majority of enemy fighter attacks occurred between 0310Z and 0400Z.

Frank L. Scott Jr.

FRANK L. SCOTT, JR.,
Colonel, Air Corps,
Chief, Intelligence Section

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Authority NND 760063
By gw NARA Date 12/6/05

ANNEX

C

ENEMY AIR OPPOSITION

* * * * * * * * * * * * * * * * * * *
* Prepared by: *
* *
* Operational Intelligence Unit *
* *
* XX Bomber Command *
* * * * * * * * * * * * * * * * * * *

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Authority NND 760063
By SW NARA Date 12/6/05

I. JAPANESE FIGHTER TACTICS - MISSION NO. 37

TARGET: Kuala Lumpur, Malaya.

TIME: Day Mission. DATE: 19 February 1945.

1. GENERAL

a. Enemy air opposition was rated very weak. Of the 59 B-29's airborne to targets, 21 reported interception to the extent of 23 single plane attacks and two coordinated attacks, resulting in a total of 27 individual encounters. No B-29's were lost due to enemy fighter action nor were any damaged. Preliminary claims against enemy aircraft were one destroyed, and seven damaged. The enemy fighter force which opposed the B-29's was estimated at 5 VALS, 4 CLAUDES, 3 NATES, 2 OSCARS, and 1 unidentified single-engine fighter with fixed landing gear.

b. All encounters occurred within the primary target area, and were spread over a considerable period of time, 0246Z to 0432Z, so that at no time were B-29 gunners kept busy. Six encounters (22 per cent of the total) were before bombs away, and 21 (78 per cent) after bombs away. The interceptions were made at altitudes from 11,000 to 13,000 feet.

2. DIRECTION AND LEVEL OF APPROACH

a. As usual, the frontal quarter was the favorite for Japanese pilots, particularly the 12 o'clock position, from which 11 enemy attacks originated. Total encounters from the frontal quarter were 15, or, 56 per cent. The remaining encounters were about evenly distributed among the other quarters with 4 (15%) from the right, 3 (11%) from the rear, and 5 (18%) from the left.

b. As to level of attack, the high approach was the outstanding favorite with 25 encounters, or, 92 per cent of the total. Of the two remaining encounters one approach was level and the other, low.

c. Considering the low bombing altitudes of the B-29's on this mission, plus the fact that most of the enemy fighter planes are rated either in, or, close to, the obsolescent class, the large percentage of high frontal attacks was not surprising. Due to B-29 speed, approaches from the rear quarter, with their slow rate of closure, were too hazardous for enemy pilots, and this was confirmed by the results which indicated that of three enemy aircraft which approached from the 5 o'clock position (the only attacks from the rear quarter) one was destroyed and another damaged. The third was probably saved by the fact that he had coordinated his attack with the enemy aircraft which was destroyed and upon which B-29 fire had been concentrated, and, that he broke away from his attack at a range of 800 yards. The high "12 O'clock Express" proved the best all-around attack for these fighters, affording them opportunities for quick thrusts, with no deflection, and a greater degree of protection in the fast rate of closure, and spread after breakaway.

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By gu NARA Date 12/6/05

Crew members reported that most enemy aircraft made one pass, then broke away to the rear to attack succeeding formations.

d. A summary of direction and level of approach for all encounters is presented in Tables No. 1 and 2, which follow.

Table No. 1 - Direction and Level of Approach

Direction of Encounter	Front			Right			Rear			Left			Total
	11	12	1	2	3	4	5	6	7	8	9	10	
High	2	10	2	1	2	-	3	-	-	-	1	4	25 (92%)
Level	-	-	-	-	1	-	-	-	-	-	-	-	1 (4%)
Low	-	1	-	-	-	-	-	-	-	-	-	-	1 (4%)
Total	2	11	2	1	3	-	3	-	-	-	1	4	27 (100%)
	15(56%)			4(15%)			3(11%)			5(18%)			

Table No. 2 - Level of Approach

Level of Approach	Front	Right	Rear	Left
High	14 (93%)	3 (75%)	3 (100%)	5 (100%)
Level	0	1 (25%)	0	0
Low	1 (7%)	0	0	0
Total	15 (100%)	4 (100%)	3 (100%)	5 (100%)

3. EXCHANGE OF FIRE

a. Japanese pilots were known to have fired in only 9 attacks, or, 33 per cent of the total, an unusually low percentage. In 9 other encounters crews reported no enemy fire, and in the remaining 9 encounters enemy gunfire was undetermined. B-29's fired in 25 of the 27 encounters (92%), about average in comparison to recent missions.

b. The following table shows comparisons of B-29 and enemy aircraft gunfire. Range estimates for Japanese gunfire were available in only 7 attacks.

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By SW NARA Date 12/6/05

Table No. 3 - Distances Opened Fire

Distance (yards)	Enemy Fire No. of Attacks	Enemy Fire Percent	B-29 Fire No. of Attacks	B-29 Fire Percent
0 to 499	3	43	5	20
500 to 799	1	14	2	8
800 to 999	1	14	7	28
1000 & over	2	29	11	44
Totals	7*	100%	25	100%

* Two additional attacks range unreported.

4. AGGRESSIVENESS OF ENEMY AIRCRAFT ATTACKS AND PILOT ABILITY

Enemy pilot aggressiveness was noticeably absent on this mission. Although several enemy aircraft did press their attacks closely, one to within 10 yards, the majority broke away at distances from 500 to 800 yards, indicating either a reluctance to come to close quarters or inexperience in combat. Pilot ability was difficult to judge accurately in view of this lack of aggressiveness, and the small number of attacks, but it was obvious that the Japanese pilots were not up to the standards which B-29 crews have encountered on previous missions to important industrial areas. This, plus the fact that mostly obsolescent or near-obsolescent airplanes were engaged, suggests the possibility that the enemy pilots were still in a training stage and were not first-line pilots. Table No. 4 shows distances to which enemy attacks were pressed.

Table No. 4 - Distances to which Attacks Were Pressed

Distance (yards)	No. of Encounters	Percent
1000 & over	2	7
800 to 999	3	11
500 to 799	12	45
250 to 499	3	11
0 to 249	7	26
Total	27	100%

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5. AERIAL BOMBING ATTACKS

Aerial bombs were employed in 5 attacks (19 per cent of the total), none of them resulting in damage to B-29's. Two unusual types of bombs were used in several attacks. The first was described as a cluster of three bombs shaped like flat boards which were wired together. It was dropped from about 1000 feet above in a head-on attack, and tumbled down without exploding. The second resembled a piece of stove pipe, from 8 to 10 inches in diameter and 4 feet long, with a cable, about 12 feet long, dangling from the end. Two of these were dropped but neither exploded.

6. COORDINATED ATTACKS

Only two coordinated attacks, each employing two CLAUDES, were reported. There were no unusual tactics in either attack, although one of the CLAUDES was reported to have used overhead cloud cover before coming in. He was first sighted only 300 yards away.

7. RAMMING ATTACKS

There were no reports of enemy attempts to ram, nor of any instances of near collisions.

8. ROCKET ATTACKS - None.

9. EVASIVE ACTION BY B-29'S - None.

10. NEW AIRCRAFT - None.

11. NEW WEAPONS - None.

12. NEW OR UNUSUAL TACTICS - None.

13. CLAIMS AGAINST ENEMY AIRCRAFT

Following are details of combat on preliminary claims of 1 destroyed and 7 damaged.

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By SR NARA Date 12/6/05

Table No. 5 - Details of Combat - Preliminary Claims

Enemy Aircraft	Claim	No. of B-29's in Formation	Direction and Level of Approach	B-29's Opened Fire (yards)	Distance E/A Broke away or Disintegrated (yards)
CLAUDE	Destroyed	3	5 high	300	300
OSCAR	Damaged	3	12 high	1000	500
CLAUDE	Damaged	3	3 high	1500	900
VAL	Damaged	3	10 high	1000	500
OSCAR	Damaged	3	12 high	1000	350
VAL	Damaged	4	5 high	900	500
VAL	Damaged	3	12 high	1000	600
VAL	Damaged	5	1 high	600	75

14. SUMMARY

a. Air opposition was very weak, with a total of only 27 individual encounters. No B-29's were lost or damaged due to enemy fighter action. Preliminary claims against enemy aircraft were 1 destroyed and 7 damaged. B-29's were opposed by an enemy force estimated at 15 aircraft, mostly obsolescent types such as VALS, CLAUDES and NATES. All encounters occurred in the primary target area.

b. The high frontal approach was the favorite with Japanese pilots, although few of the attacks were aggressively pressed. Enemy pilots fired in only 33 per cent of the encounters while B-29's fired in 92 per cent. Aerial bombs were employed in 5 attacks, none resulting in damage to B-29's. Only 2 coordinated attacks were reported.

c. There were no ramming attempts, rocket attacks, new aircraft or new weapons.

15. MARKINGS OF ENEMY AIRCRAFT

An unidentified enemy aircraft in the primary target area was observed to have two white stripes on each wing running parallel to the fuselage. Markings on other enemy planes varied. Some were silver in color, others olive-drab with red roundels on wings.

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By gw NARA Date 12/6/05

ANNEX

D

WEATHER INFORMATION

I - Weather Information

II - Chart - Weather as Forecast and as Encountered

III - Synoptic Map

* * * * * * * * * * * * * *
* Prepared by: *
* *
* Weather Section *
* XX Bomber Command *
* * * * * * * * * * * * * * *

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Authority NND 760063
By gw NARA Date 12/6/05

I - WEATHER INFORMATION

Mission No. 37

19 February 1945

	As Forecast	As Encountered
Base at Take-off	Sctd clouds at 4000'. Visibility 10 miles. Winds southerly at surface at 10 mph.	DUDHKUNDI: Broken altostratus at 9000'. Scattered stratocumulus at 3000'. Visibility 5 miles. Wind calm. KHARAGPUR: Stratus overcast at 3000' with lower scattered stratocumulus at 1500'. Visibility 4 miles in light rain, improving to 6 miles about 15 minutes after take-off, at which time rain stopped. Wind variable SE to NE at 5 mph.
Route Out	BASE TO COAST: Line of cumulus along the coast with base at 3000' and tops to 10,000'. Moderate turbulence in clouds. COAST TO 16 N: Clear to 3/10 stratocumulus, base 2000' tops 3000'. 16° TO 8°: Scattered cirrus at 20,000'. Scattered altostratus at 13,000'. Scattered stratocumulus tops 3000'. 8° TO 6°: Area of convergence or weak frontal zone overcast altostratus base 12,000', tops 15,000'. 5/10 stratocumulus and cumulus base 2000' tops generally 7000', but some tops building through the altostratus layer to 15,000'. Light rain showers at 5000' with light to moderate turbulence. 6° TO TARGET: Broken to overcast cirrostratus at 28,000'. 5/10 altostratus in large patches base 12,000', tops 15,000'. 5/10 stratocumulus and cumulus base 3000' tops 5000' at 0800 local and increasing to 10,000' by 1000 local time. Visibility 20 miles.	BASE TO 20°N: Overcast stratocumulus base 4000' becoming clear at 20°N. 20° TO 15°N: Clear to scattered stratocumulus tops at 3000'. 15° TO 12°N: Scattered to broken stratocumulus tops 3000'. Broken stratus layers at 5000' and 10,000'. The stratus layers thickened to overcast with a few building cumulus in weak zone of convergence at 12°N. Light to moderate turbulence at 3000' in zone of convergence. 12° TO 8°N: Variable layers of altostratus and altocumulus between 10,000' and 20,000', with main layer at 12,000'. In general, the layers were thin and scattered but with a few broken areas. 8° TO 5°N: Broken stratocumulus and cumulus. Tops of stratocumulus at 4000'; tops of cumulus at 8000'. Many towering cumulus to 20,000' with variable layers of altostratus-altocumulus surrounding the towering cumulus between 10,000' and 20,000'. 5° TO TARGET: 5/10 stratocumulus, bases 3000'. Broken altostratus, base 13,000' tops 15,000'. Towering but avoidable cumulus to 20,000' to within 50 miles of target area. Scattered cirrostratus at 30,000'.

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By gu NARA Date 12/6/05

	As Forecast	As Encountered
Target Area	Same as weather from 6° to target. Visibility 20 miles. Pressure at target: 29.77 inches. Mean bombing temperature from 18,000': 11° C. Temperature at 18,000' over target: -3° C.	KUALA LUMPUR: 0700 IST. 3/10 patchy stratocumulus at 3000'. Scattered thin altostratus at 14,000'. Scattered cirrostratus at 30,000'. Visibility 30 miles. 0900 IST. Small cumulus with tops at 5000' varying from 1/10 to 5/10. 5/10-7/10 altostratus base 13,000' tops 14,000' scattered cirrostratus at 30,000'. Visibility 30 miles.
Route Back	Similar to route out except for the diurnal variation of the cumulus clouds. Sctrd thunder-storms over land areas to right of course with tops to 25,000'. Few cumulus over water with tops to 15,000' below 15° N.	TARGET TO 10°N: The early morning towering cumulus had dissipated to a thick altostratus layer, base 12,000', Tops unknown. Scattered to broken stratocumulus tops 4,000'. 10° TO 14°N: 5/10 stratocumulus tops 4,000'. Scattered layers of altostratus at 12,000' and 18,000'. 14°N: Weak convergent zone. 7/10 stratocumulus tops 4,000'. Overcast altostratus, base 8,000' and a few building cumulus. Light rain and light turbulence at 8,000'. 14°N TO COAST: Scattered strato-cumulus tops 4,000' becoming nil at 16°N. Broken altostratus at 8,000' becoming nil at 17°N. Few patches of thin altostratus at 15,000' to 20°N. COAST TO BASE: Broken cumulus bases 5,000' tops 10,000' along coast be-coming scattered to nil in base area.
Base on Return	Broken clouds base 3,000' tops 6,000' with few tops to 10,000'. Visibility 10 miles.	DUDHKUNDI: 2/10 cumulus base 5,000'. Visibility 8 miles. Wind calm. KHARAGPUR: High scattered altocumulus. Scattered fair weather cumulus at 4,000'. Visibility 8 miles. Wind NE-NNE 6 to 7 mph.

A. Winds Aloft - Forecast

ALTITUDE	BASE - 18°N	18°N - 12°N	12°N - 6°N	6°N - TARGET
3,000'	240 Deg-08K	130 Deg-08K	30 Deg-05K	30 Deg-06K
5,000'	240 Deg-12K	130 Deg-10K	30 Deg-06K	30 Deg-06K
10,000'	270 Deg-25K	270 Deg-20K	180 Deg-20K	100 Deg-15K
15,000'	270 Deg-60K	270 Deg-30K	230 Deg-20K	100 Deg-12K
20,000'			230 Deg-20K	110 Deg-15K

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By gw NARA Date 12/6/05

B. Winds Aloft - Encountered

ALTITUDE	15° N	TARGET
3,000'	130 Deg-12K	
6,000'	195 Deg-17K	
10,000'	176 Deg-16K	
12,000'		141 Deg-17K

C. Temperatures

As Forecast

ALTITUDE	15° N	TARGET
3,000'	22 Deg C.	
5,000'	20 Deg C.	
10,000'	10 Deg C.	12 Deg C.
15,000'	04 Deg C.	04 Deg C.
20,000'		-05 Deg C.

As Encountered

ALTITUDE	8°N	TARGET
3,000'	21 Deg C.	
10,000'	13 Deg C.	
12,000'		04 Deg C.
14,000'		03 Deg C.

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By gu NARA Date 12/6/05

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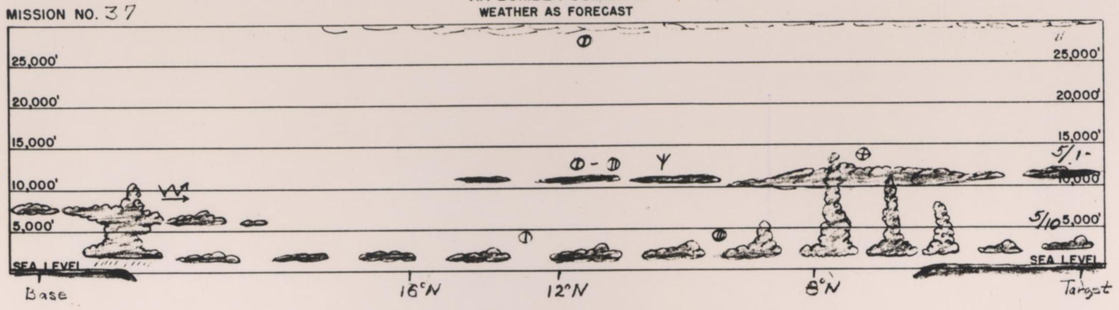
Authority NND 760063
By gw NARA Date 12/6/05

SECRET

XX BOMBER COMMAND

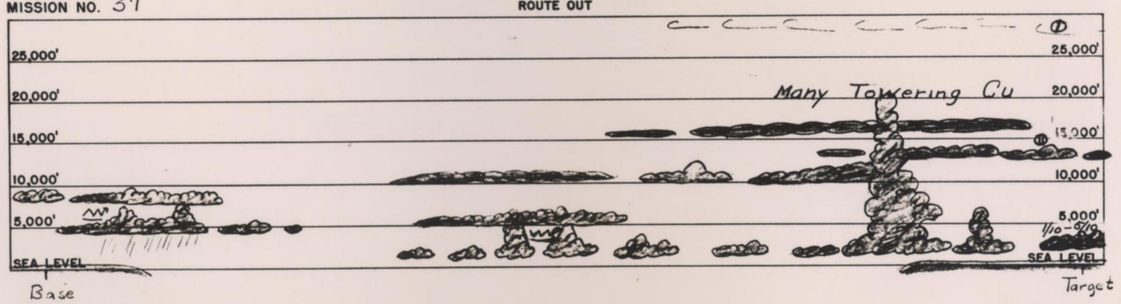
WEATHER AS FORECAST

MISSION NO. 37



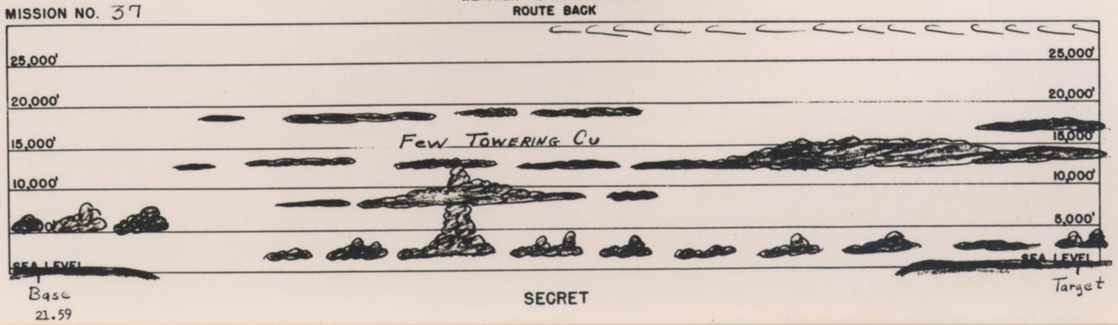
WEATHER AS ENCOUNTERED
ROUTE OUT

MISSION NO. 37



WEATHER AS ENCOUNTERED
ROUTE BACK

MISSION NO. 37



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ANNEX

E

COMMUNICATIONS INFORMATION

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* * * * * * * * * * * * * * * * *
* Prepared by:                   *
*                               *
*     Communications Section    *
*                               *
*         XX Bomber Command     *
* * * * * * * * * * * * * * * * *
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DECLASSIFIED
E.O. 11652, Sec. 3(E) and 5(D) or (E)
NND 740120
By dlf NARS, Date OCT 21 1975

DECLASSIFIED
Authority NND 760063
By sw NARA Date 12/6/05

SECRET

SECRET
Auth: CG, XX BC
Initials:
Date: 24 Feb 45

HEADQUARTERS
XX BOMBER COMMAND
APO 493

CONSOLIDATED
SPECIALISTS MISSION
REPORT OF

XX BOMBER COMMAND COMMUNICATIONS (RADIO) OFFICER

Date prepared: 23 February 1945. Field Orders: 37

Date of Mission: 19 February 1945.

PART I

1. Mission number thirty-seven (37) was accomplished by the 444th and 468th Bomb Groups. Based upon the greatest number of such messages which could be received (i.e., one per aircraft), the following percentage figures indicate the number of aircraft accounted for by Bombs Away and 400 Mile from Base Position Report messages:

a. Bombs Away messages:

	444th Group	468th Group	Total
No of a/c from which msg could be expected:	28	29	57
No of msgs received:	9	12	21
No of a/c accounted for by msgs:	28	27	55
% of a/c accounted for by msgs:	100%	93%	96.5%

Note: The two unaccounted for aircraft of the 468th Group transmitted Bombs Away messages by "fox" type transmission, but the messages were not intercepted by the ground station.

b. 400 Mile from Base Position Report:

	444th Group	468th Group	Total
No of a/c from which msg could be expected:	28	29	57
No of msgs received:	16	29	45
No of a/c accounted for by msgs:	28	29	57
% of a/c accounted for by msgs:	100%	100%	100%

c. A total of one (1) abort message, 5 attack messages and one (1) Convoy Sighting message was received by the ground stations from aircraft of both groups.

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PART II

2. No distress traffic was logged during the mission.

PART III

3. No violations of cryptographic or transmission security were logged.

4. One aircraft of the 444th Group violated tactical doctrine when it transmitted the operating signal QAC upon aborting, instead of the encoded message stating reason for abort and position at time of abort as required by the doctrine. However, after a lapse of twenty minutes the aircraft did transmit the required encoded report.

PART IV

5. Air-ground frequencies were in use from 1800 GMT to 1030 GMT the following day. During the first three and last three hours of the mission, frequencies remained clear of static, but during the remaining time high static levels were experienced as the aircraft flew through local storms. During this same period, excessive fading was experienced on the eight megacycle frequencies in use, but the twelve megacycle frequencies remained unaffected. The fading was noticed mostly on aircraft transmissions, the signal strength dropping in some instances to a zero level, especially when the aircraft were over the target. This is the first instance this Command has had of such excessive fading, the eight megacycle frequencies having performed very satisfactorily in the past. On this mission aircraft bombed at an average altitude of 12,000 feet instead of the normal 20,000 feet, and it is believed that this altitude differential accounted for the excessive fading noted above. In connection with this, it is of interest to note that airborne operators were very reluctant to shift from the eight to the twelve megacycle frequencies and in the majority of cases had to be instructed to do so, although briefing and training has stressed to point to use the best frequency available. This reluctance to shift frequency undoubtedly resulted in the failure of the ground station to intercept the two bombs away messages which were sent by "fox" type transmission, and illustrates the point that although aircrew members are indoctrinated otherwise, they will usually attempt to use those facilities which in the past have proved themselves until they are no longer useable, even though the situation demands an earlier change to achieve better results.

6. No attempts at jamming on the part of the enemy were noted.

7. 444th Group reported interference by station GZH on 8495 kilocycles between 1830 and 0045 GMT, transmitting call sign only.

8. 444th Group reported what were apparently two deception messages. Circumstances surrounding these messages are as follows:

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a. At 2210 GMT the ground station received what was apparently a message from aircraft 411 which consisted of the callup, followed by the operating signal "QAC" and the phrase B-3, which is the short title for the 444th Groups base at Dudhkundi. Ground station immediately attempted to contact aircraft and could not do so. No attempt at authentication was made on initial transmission. Aircraft 411 was next heard when it transmitted a bombs away message. At post-flight interrogation, the operator denied having sent any such message.

b. At 2252 GMT the ground station received what was apparently a message from aircraft 899 which consisted of the callup, followed by the operating signal "QRD" and the phrase DV Ø4. Ground station immediately attempted to contact aircraft and could not do so. No attempt at authentication was made on initial transmission. Aircraft 899 was next heard when it transmitted a bombs away message. At post-flight interrogation the radio operator denied having sent any such message.

c. Ground station operators state that in both instances the apparent aircraft called the ground station and immediately transmitted the context of the message without waiting for the ground stations "K", as is the usual procedure in this Command. As the second message violated tactical doctrine, and as the "DV" referred to in the second message could not be located in any existing facility chart, its authenticity was questioned by the 444th Group personnel upon receipt, and if an attempt to cause confusion was the purpose of this apparent deception it failed to that extent. Ground station personnel stated that the transmitter note, signal strength and type of sending did not differ from that which they were accustomed to hearing.

d. The first such message received, however, did result in the 444th Group transmitting a message to the striking force stating that aircraft 411 had aborted and consequently the aircraft was not expected at rendezvous. It did however, sucessfully rendezvous and bomb in formation. It is believed that the acceptance of this message as genuine was the result of having previously received a similar message from aircraft 897 which actually did abort, and which followed up with a properly encoded message. In both cases a violation of tactical doctrine occurred which in one instance was rectified, thus lulling any suspicion which might have arisen upon receipt of the second message. It is suggested that in the future aircraft of the 444th Group comply more strictly with those procedures outlined in the tactical doctrine and that receiving personnel view with suspicion any message which does violate those procedures.

PART V

9. Statistical data on radio aids to navigation:

a. Radio Beacons:

Location	Power	No of a/c rptg	Average Initial Contact	Extreme Initial Contact
Kharagpur	1200W	20	350	600
Dudhkundi	25W	7	115	200
Dum Dum	3000W	1	600	600
Ahmeda Road	50W	1	150	150
Chittagong	1200W	2	265	280

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b. Radio Ranges:

Location	Power	No of a/c rptg	Average Initial Contact	Extreme Initial Contact
Dum Dum	400W	3	450	600

c. Six requests for D/F aid were made, all by aircraft of the 468th Group. No unusual occurrences were noted. One of the requests was made when approximately 900 miles from the D/F site and the bearing furnished proved accurate to within 2 degrees.

d. Air-to-air homing was not used on this mission, the method of assembly (i.e., three ship formations) being such that its use was not necessary.

PART VI

10. Following are the malfunctions to radio equipment which occurred during the mission:

a. 444th Group:

(1) A/C 720 had the SCR 522 transmitter overheat and start smoking; as this occurred just prior to landing, no attempt at repair in flight was made.

(2) A/C 268 and 270 had the compass sense antenna break at the point where it attaches to the forward mast. Compass was connected to command set antenna by a jumper wire for use as a substitute antenna.

(3) A/C 732 had the SCR-522 receiver malfunction. Could not be repaired in flight.

(4) A/C 884 could not properly load the An/ART-13 transmitter, and could obtain no PA Grid or PA Plate meter indications. Could not be repaired in flight.

b. 468th Group:

(1) A/C 658 had trouble with SCR-274N modulator unit in that it continually blew fuses. Cause could not be found and the modulator was not repaired in flight.

(2) A/C 445 had the liaison antenna carry away. Trailing wire was used in its stead.

(3) A/C 895 lost the use of one command set receiver when it developed an internal short. Not repaired in flight.

(4) A/C 734 and 909 had the compass sense antenna break at the point where it fastens to the forward mast. Both substituted the command set antenna as a sense antenna by means of a jumper wire from the compass to the SCR-274N antenna switching relay.

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(5) A/C 456 had the radio compass loop antenna carry away. The lead in for the compass sense antenna also broke off where it connects to the aircraft skin.

PART VII

11. Mission number 37 was successful because of the fact that the striking force was forwarned of a change in bombing altitude by means of a radio message passed back by a weather aircraft which flew over the target area one hour in advance of the striking force. This message changed the bombing altitude by son seven thousand feet and permitted visual bombing. The message wa transmitted on one of the XX Bomber Command air-to-air command frequencies (6690 kilocycles) and consisted of the word "SEVEN" repeated three times. This indicated that bombing was to be performed at the briefed altitude less seven thousand feet. The message was initially transmitted at 0045 GMT and repeated three more times, at 0130, 0145 and 0215 GMT. All transmissions were addressed to the Bomber Command Collective call sign and all aircraft received the message and so effected the necessary change in altitude.

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ANNEX

F

RADAR

I - Radar Information *

Section A - Navigation and Bombing
Section B - Scope Photography
Section C - Serviceability

II - Radar Tables *

Table A - Bombing Data
Table B - Photographic Results
Table C - Serviceability
Table D - Malfunctions

III - Radar Photograph Analysis Charts **

* Prepared by Radar Section, XX Bomber Command

** Prepared by Target Intelligence Unit,
XX Bomber Command

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Authority NND 760063
By sm NARA Date 12/6/05

S E C R E T

.SECRET .
.Auth: CG XX BC .
.Initials CS .
.Date 24 Feb 45 .

HEADQUARTERS
XX BOMBER COMMAND
APO 493

24 February 1945.

CONSOLIDATED
SPECIALIST MISSION
REPORT OF

XX BOMBER COMMAND RADAR OFFICER

Date Prepared 24 February 1945 Field Orders No. 37
Date of Mission 19 February 1945

I - RADAR INFORMATION

A - Navigation and Bombing

1. The primary target, Kuala Lumpur, Malaya, was distinctly a visua l target; hence, all bombing on this mission was accomplished by the visual method. Radar provided considerable assistance to bombing, through the radar bombsight procedure, by positively identifying the initial point and the offset distance the aircraft track passed along the Malaya coastline. Operators reported considerable ease in taking bearings on identifiable land features and noting the distance for the correct track to the target area, although the target did not appear on the radar scope.

2. Radar was again useful for navigation, but was particularly valuable in directing aircraft around storm areas.

B - Scope Photography

1. Scope photography was satisfactory. Many pictures were received of navigational check points, and several excellent photographs of cloud formations were also returned.

2. Eleven (11) sets of photographs were received tracing the bombing run. The target area could only be identified by offset from the Malaya coastline and even then not very accurately.

C - Serviceability

1. Serviceability of the radar systems was far above average and constituted the best operation to date. A total of fifty-four (54) or ninty-nine (99) per cent of the systems were operational over the target area.

2. One (1) system was rendered inoperative when the radome blew off while the other repairable malfunctions were of the usual nature.

3. There were no malfunctions of auxilliary equipment.

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By sm NARA Date 12/6/05

II - RADAR TABLES

A - Bombing

Total A/C Bombing (All Visual)- - - - - - - - - 57
Total A/C Bombing Kuala Lumpur (P.T.) - - - - 49
Total A/C Bombing Alor Star Airfield (S.T.) - 3
Total A/C Bombing Martaban (L.R.T.) - - - - - 1
Total A/C Bombing Batu Arang (T.O.) - - - - - 4

B - Photographic Results

DATA	444th Gp		468th Gp		Total	
	No.	%	No.	%	No.	%
No. Cameras Installed	10		12		22	
K-24 Cameras	3		7		10	
K-35 Cameras	7		5		12	
No. Cameras in Abort, Early Return and Missing Aircraft *	0	0	0	0	0	0
No. Cameras Completing Mission *	10	100	12	100	22	100
No. Cameras in Radar & Camera Malfunction Aircraft #	1	10	3	25	4	18
Sets of Pictures Returned #	8	80	6	50	14	64
No. Negatives Returned	248		96		344	
Sets of Pictures Useable **	8	100	4	67	12	87
Sets of Pictures Tracing Bomb Run **	7	87	4	100	11	92

* Percentage based on cameras installed.
\# Percentage based on cameras completing mission.
** Percentage based on sets of pictures returned.

C - Serviceability

DATA	444th Gp		468th Gp		Total	
	No.	%	No.	%	No.	%
Aircraft Airborne	30		29		59	
Aircraft Reporting	29		28		57	
APQ-13 Operative at Take-Off *	28	97	27	96	55	97
Aircraft Bombing	28		29		57	
Aircraft Reporting Bombing *	27	93	28	100	55	97
APQ-13 Operative over Target #	27	100	27	96	54	99
APQ-13 Unrepairable Failures						
Completely Inoperative #	2	7	2	7	4	7
Partially Inoperative #	1	4	1	4	2	4
Total	3	11	3	11	6	11
APQ-13 Repaired in Flight #	3	11	1	4	4	7
SCR-695 Failures*	0	0	0	0	0	0

* Percentage based on Aircraft Reporting.
\# Percentage based on Aircraft Reporting Bombing.

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D -- Malfunctions

DATA	444th Group	468th Group	Total
Between Take-Off and Target			
Completely Inoperative:			
Inverter Failure	1	0	1
Dome Blew Off	0	1	1
Partially Inoperative:			
Spoking	0	1	1
Total Completely Inoperative	1	1	2
Total Partia lly Inoperative	0	1	1
Total Malfunctions Between T-O & Tgt	1	2	3
Between Target and Landing			
Completely Inoperative:			
Short in Range Unit	1	0	1
Operator's Scope Out	0	1	1
Partially Inoperative:			
A.F.C. Faulty, Low Range	1	0	1
Total Completely Inoperative	1	1	2
Total Partially Inoperative	1	0	1
Total Malfunctions Between Tgt & Landing	2	1	3
Repaired in Flight			
Changed Inverters	1	0	1
Replaced 6SN7 in Range Unit	1	0	1
Fixed Faulty Scope Connection	1	0	1
Re-Phased Indicators	0	1	1
Total Malfunctions Repaired in Flight	3	1	4
Summary, APQ-13 Malfunctions			
Completely Inoperative	2	2	4
Partially Inoperative	1	1	2
Repaired in Flight	3	1	4
Total	6	4	10
Malfunctions of Auxilliary Equipment			
SCR-695	0	0	0

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RADAR PHOTOGRAPH ANALYSIS

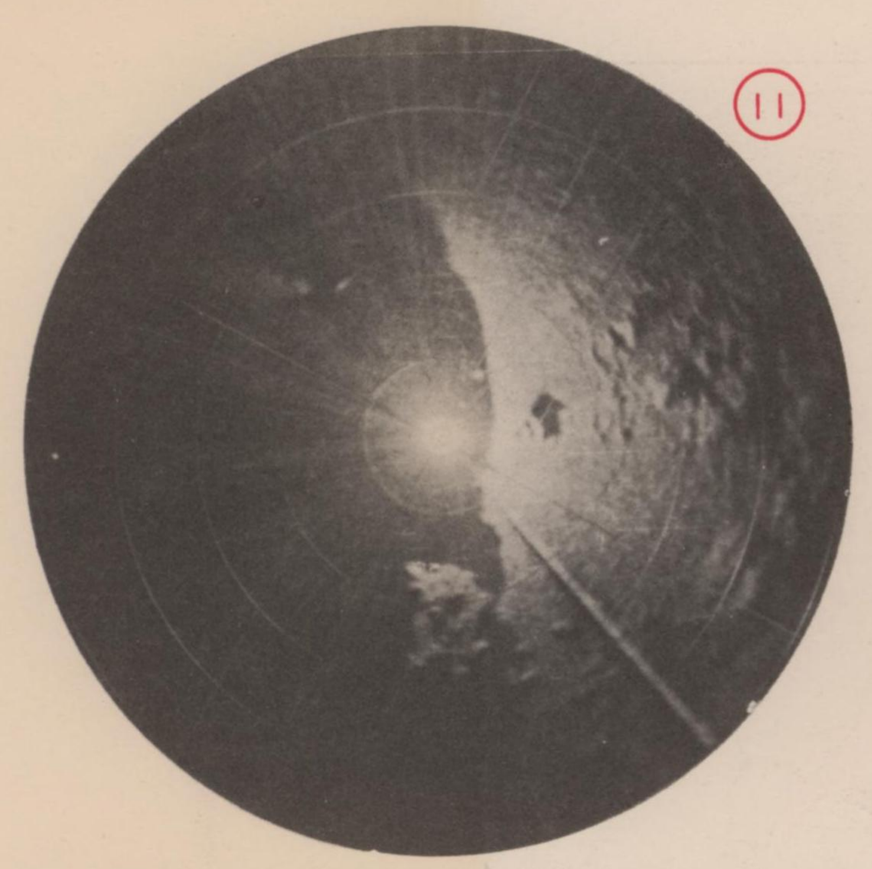
KUALA LUMPUR AREA - MALAY STA

MISSION NO. 37

A/C 315 19/2/45

ALL ALTITUDES 10,000' AND SWEEPS 50 MILES UNLESS OTHERWISE INDICATED

LOCATION OF PHOTOGRAPHS 11 AND 12 FALL OFF MAP



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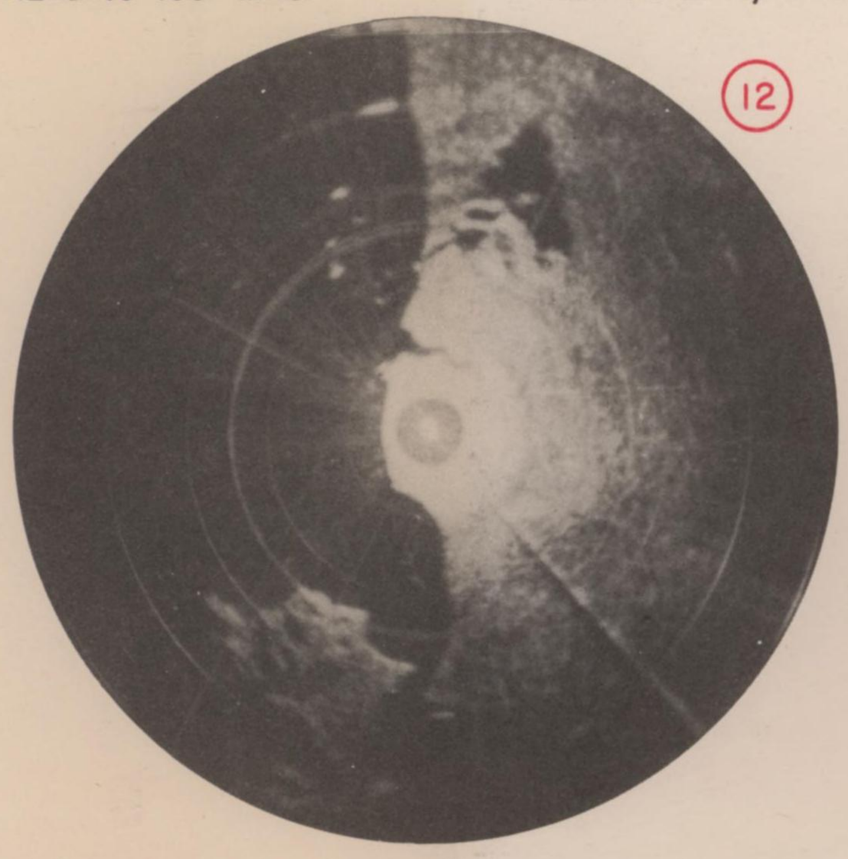

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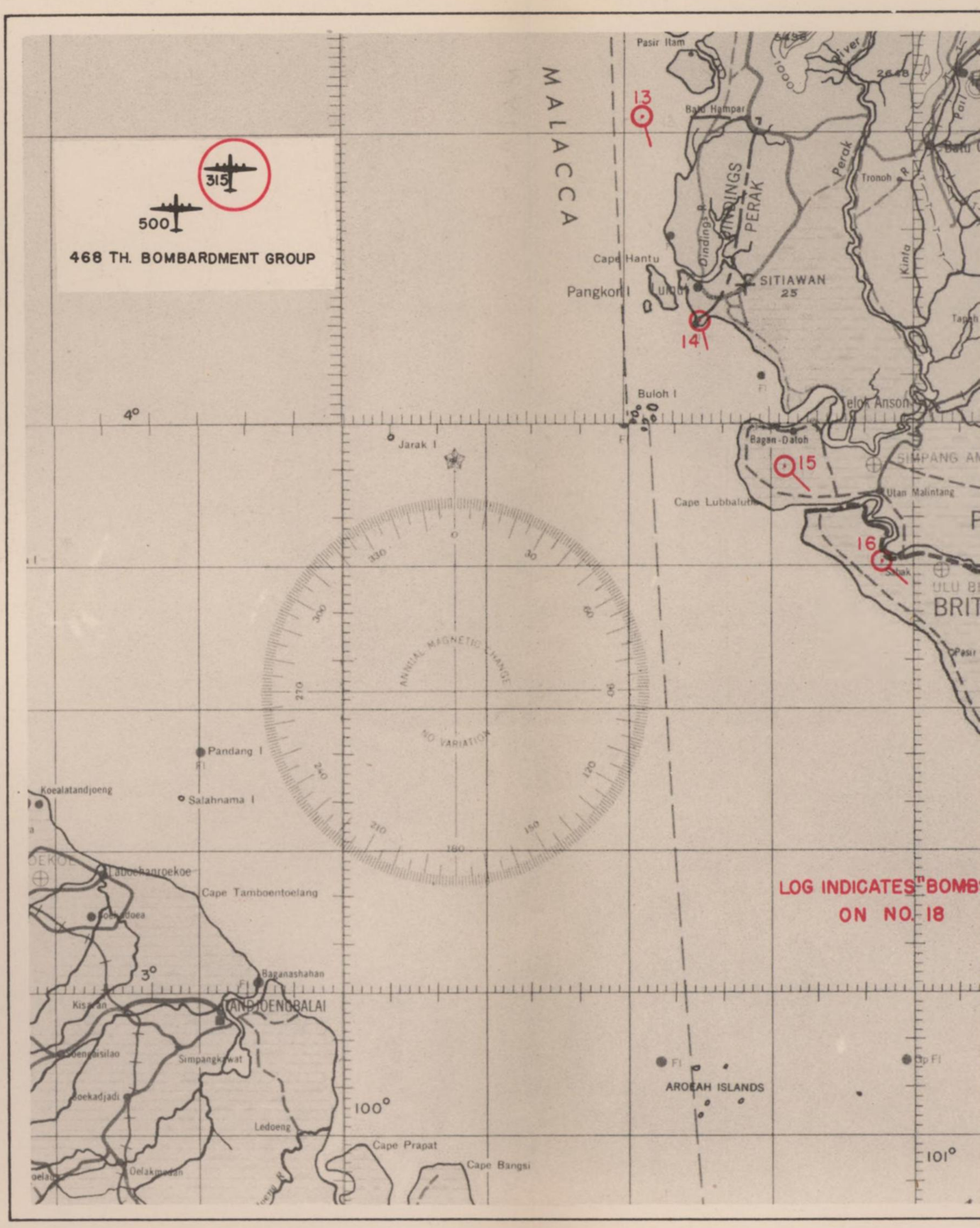

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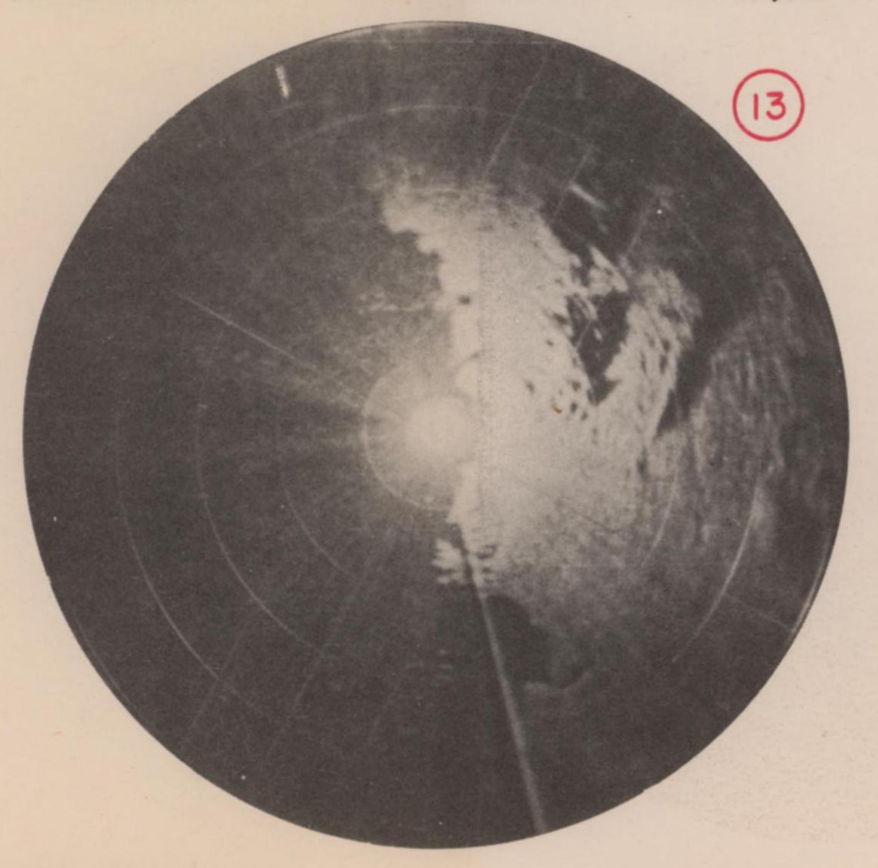
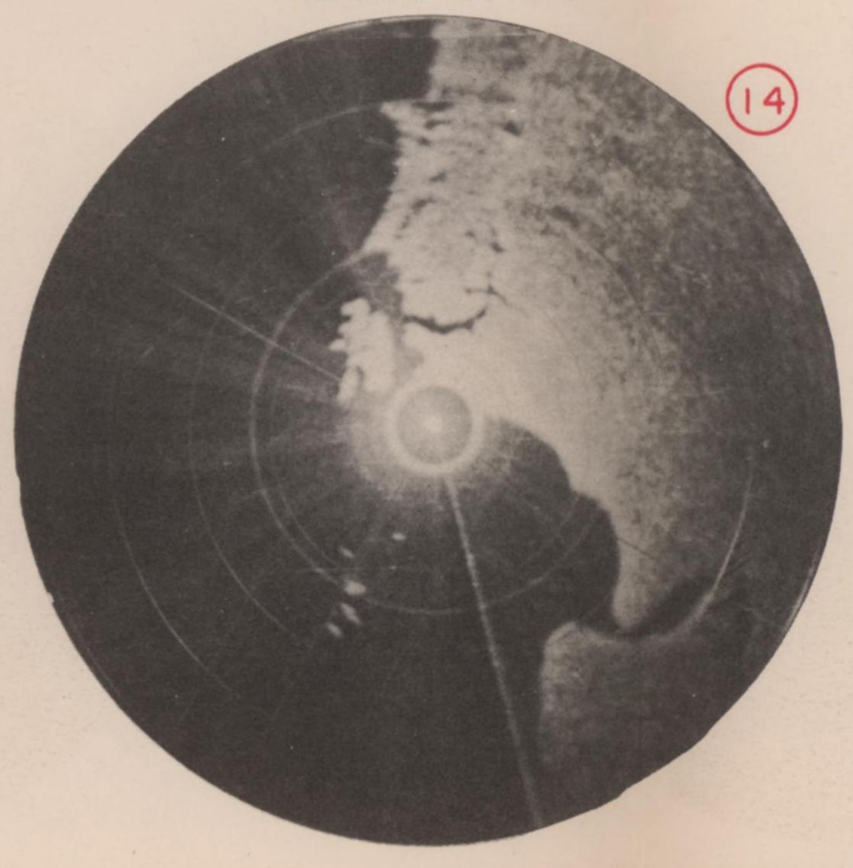


HEADING 165° MAG. ALTITUDE 13,000'



PREPARED BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION –

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By gu NARA Date 12/6/05

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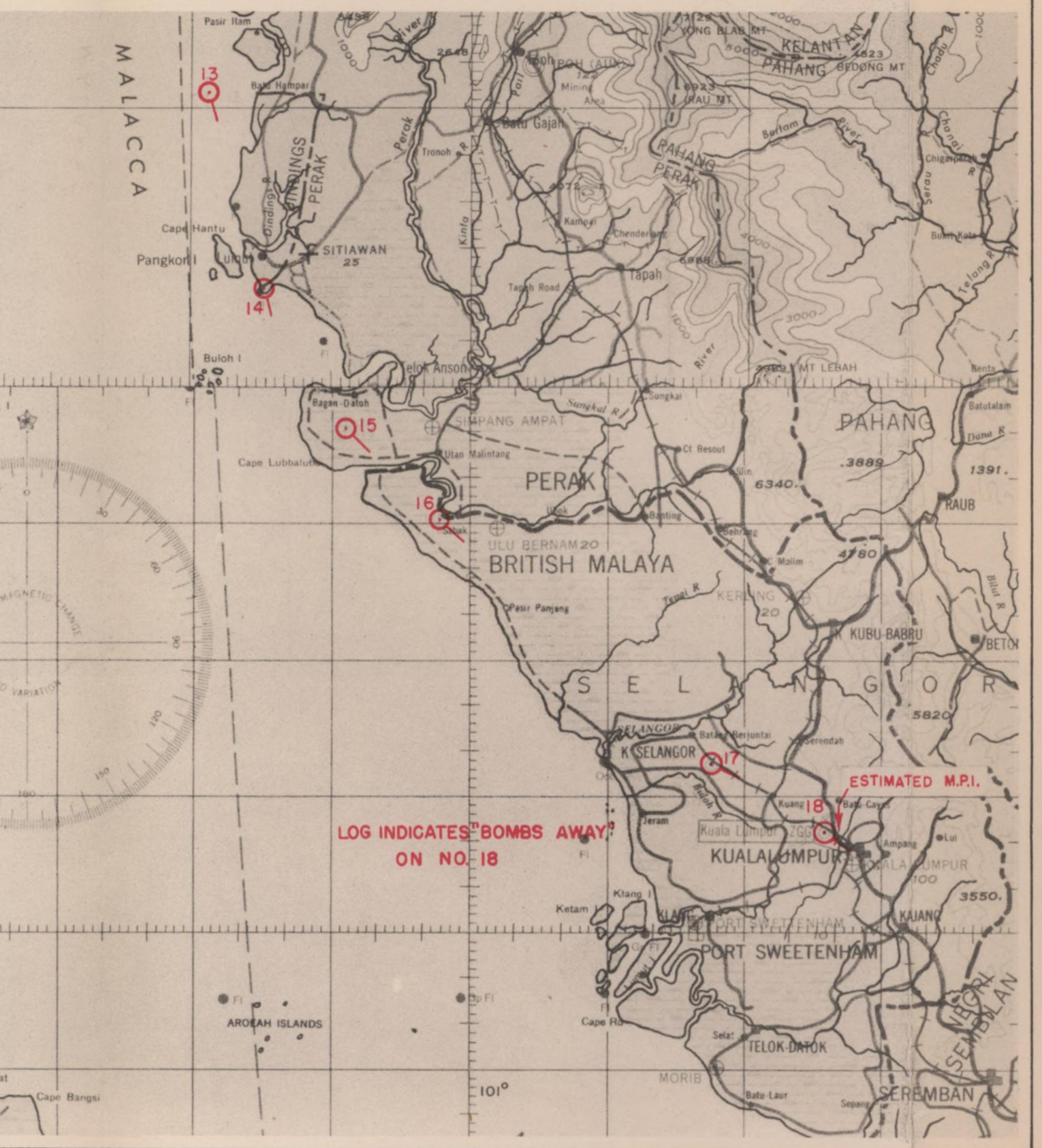
RADAR PHOTOGRAPH ANALYSIS
KUALA LUMPUR AREA - MALAY STATES
MISSION NO.37

R 92.1 SHEET B



18

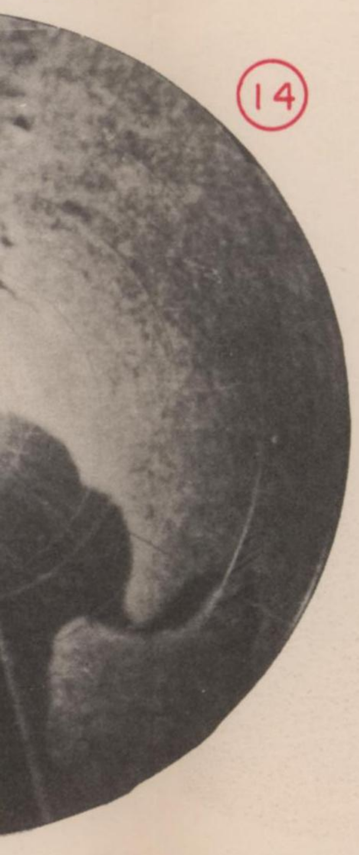
HEADING 126° MAG.

17

HEADING 118° MAG.

5° MAG.

14



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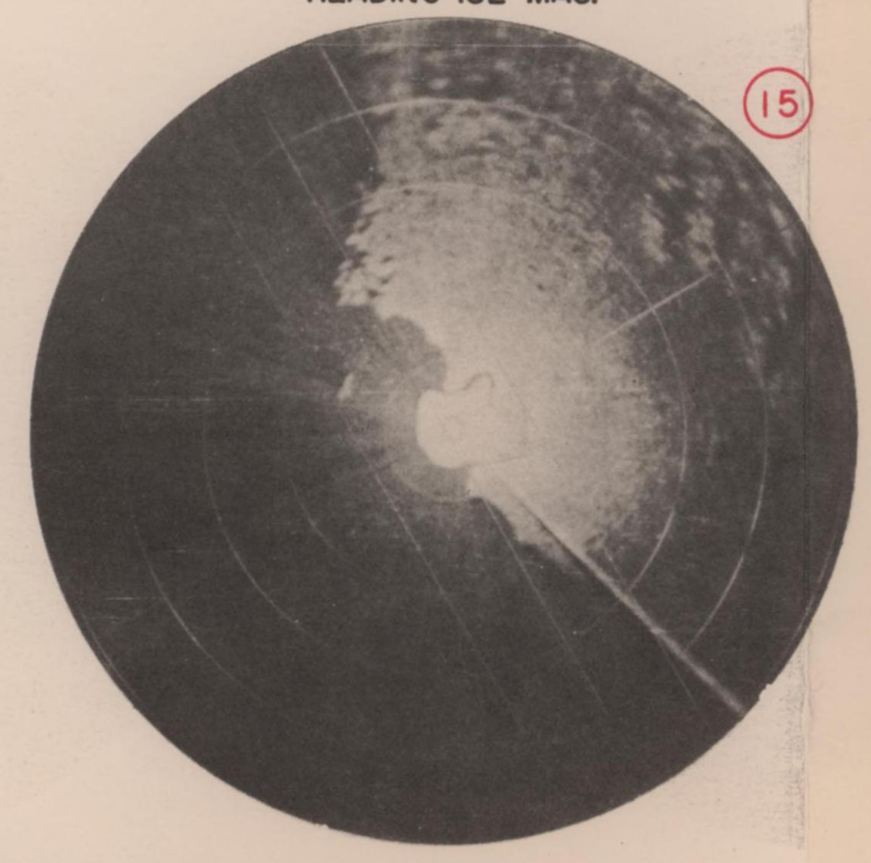

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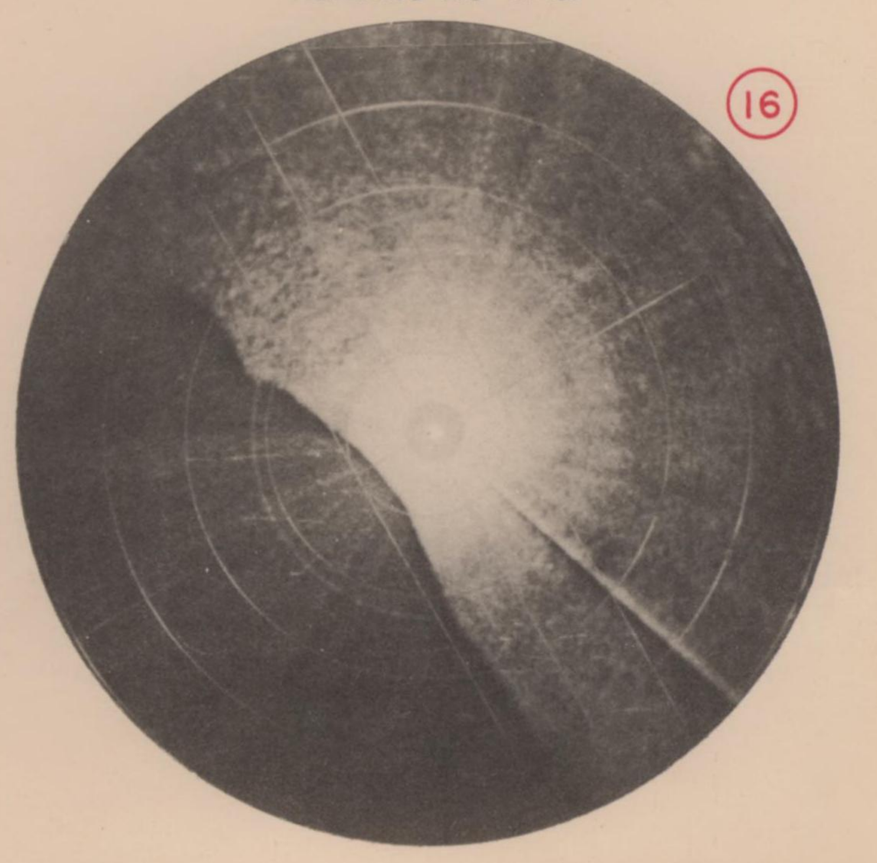

HEADING 130° MAG.

20 MILE SWEEP

BY RADAR INTELLIGENCE, TARGET UNIT. INTELLIGENCE SECTION – XX BOMBER COMMAND

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By gw NARA Date 12/6/05

A/C 678 19/2/45

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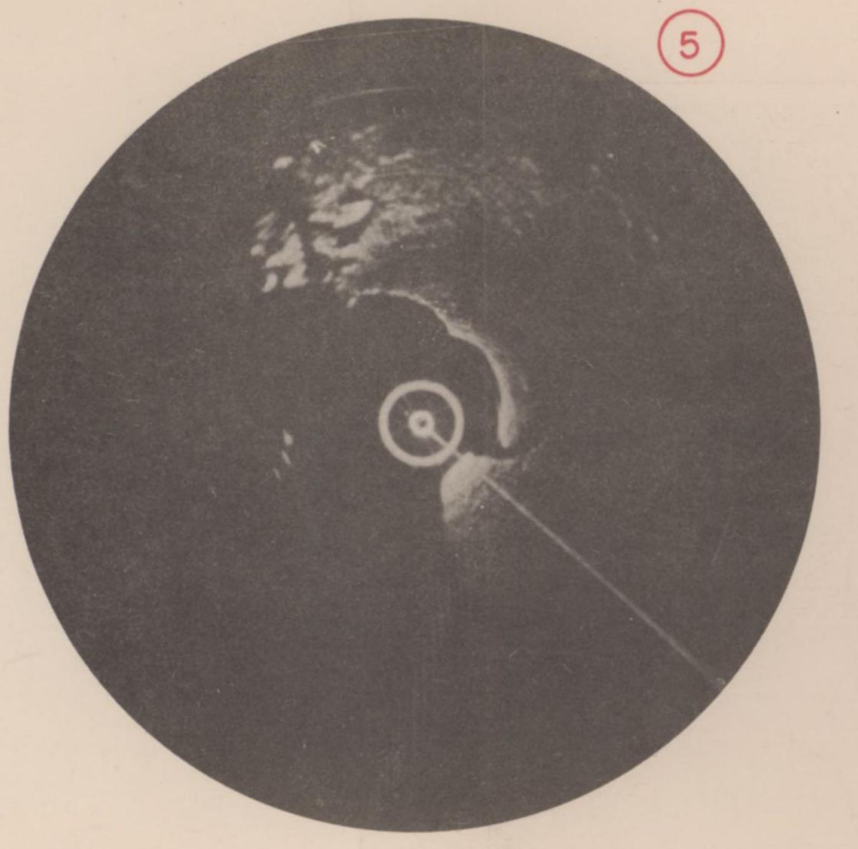
RADAR PHOTOGRAPH ANALYSI

KUALA LUMPUR AREA - MALAY STA

MISSION NO.37

ALL SWEEPS 20 MILES AND ALTITUDES 12,000'
132° HEADING FOR PHOTOGRAPHS 5-10

(5)



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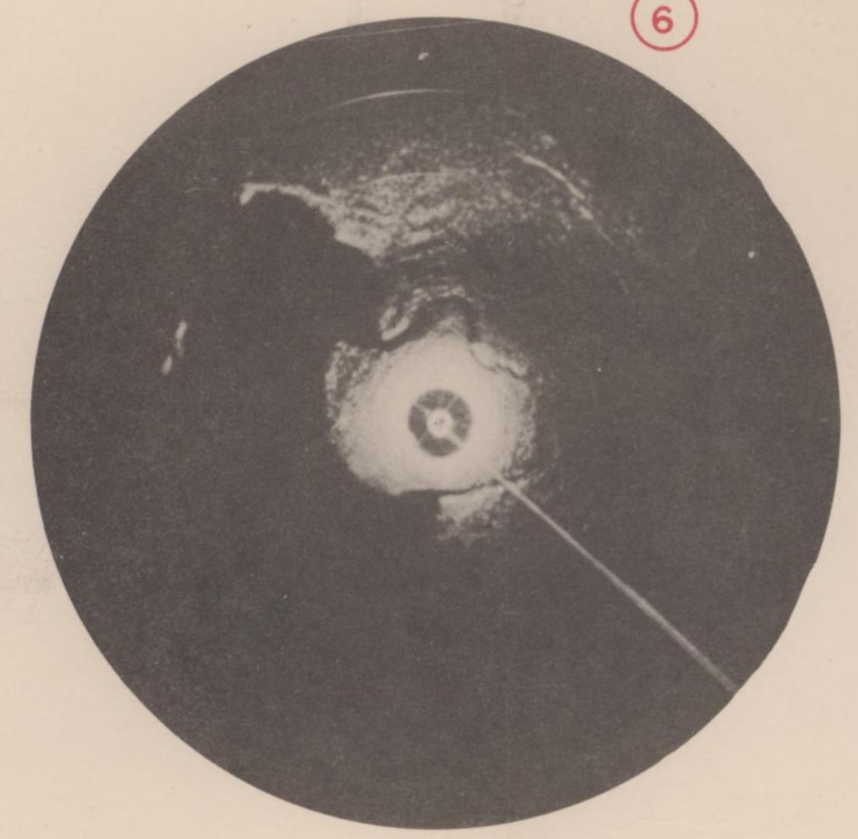
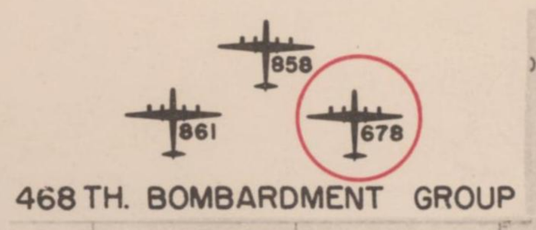
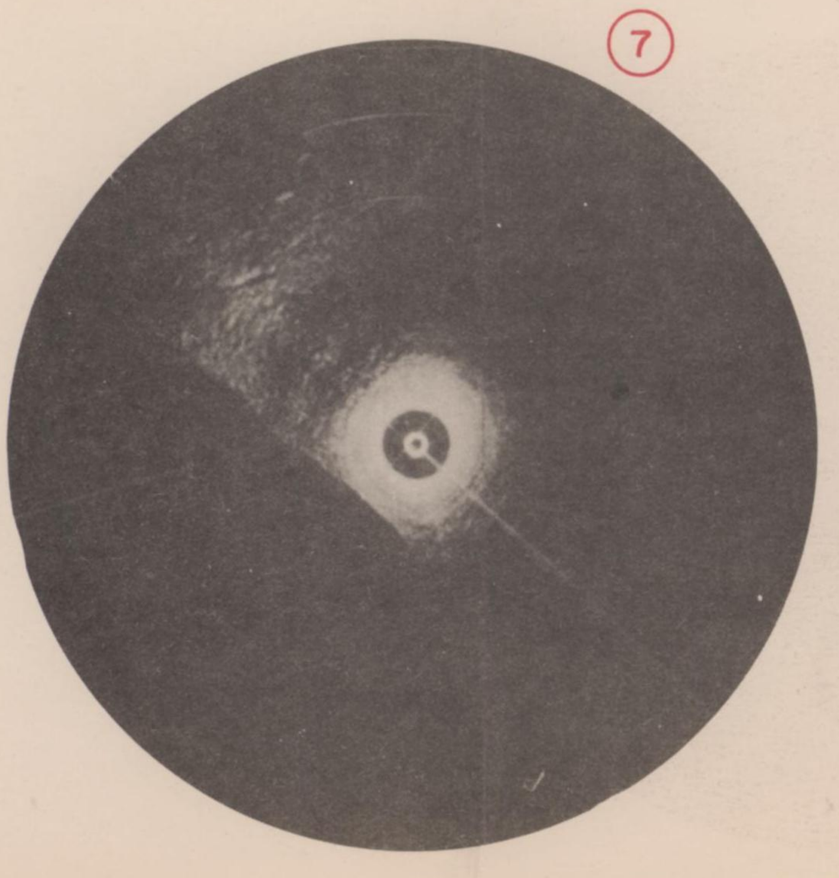




468 TH. BOMBARDMENT GROUP

LOG INDICATE "BOMBS A
ON NO. 12

(7)



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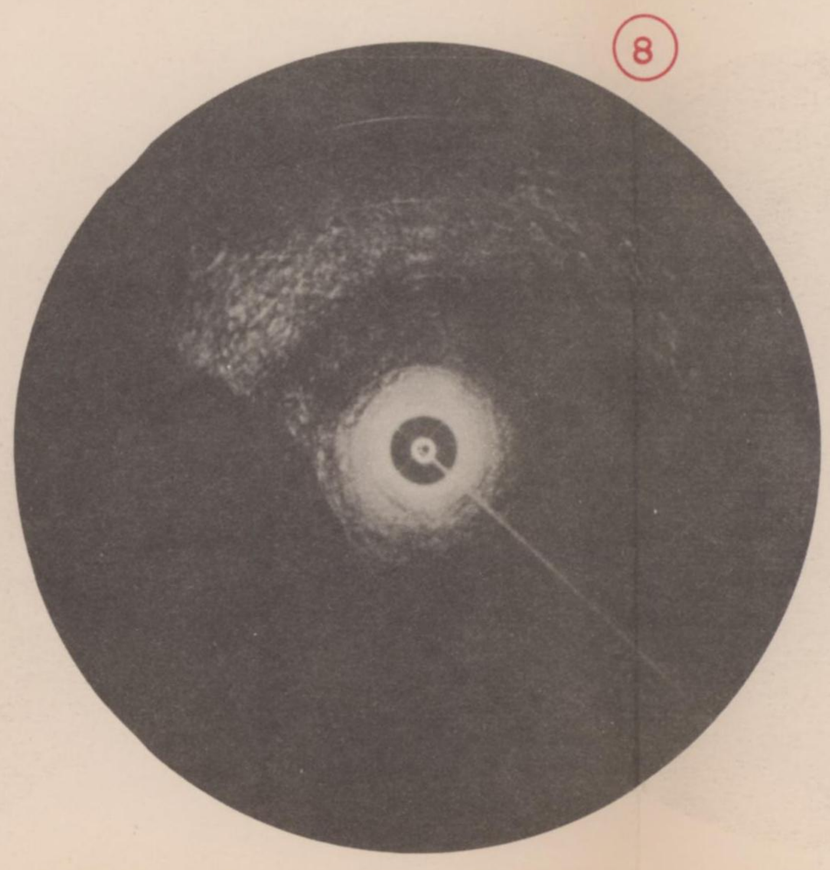

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R-92.1 SHEET C

RADAR PHOTOGRAPH ANALYSIS
KUALA LUMPUR AREA - MALAY STATES
MISSION NO.37

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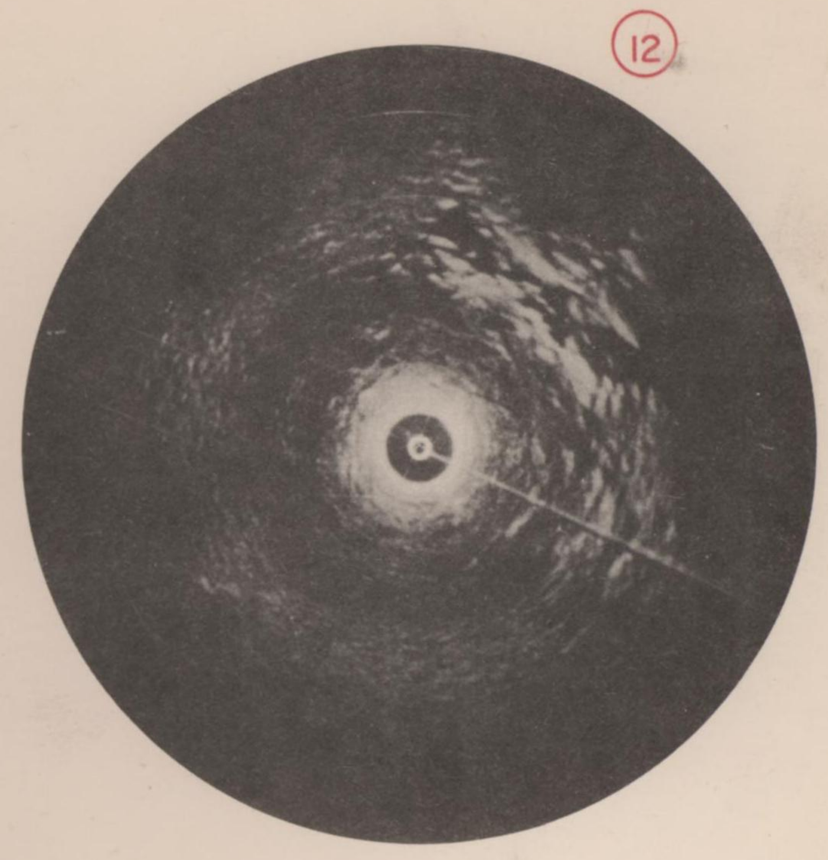

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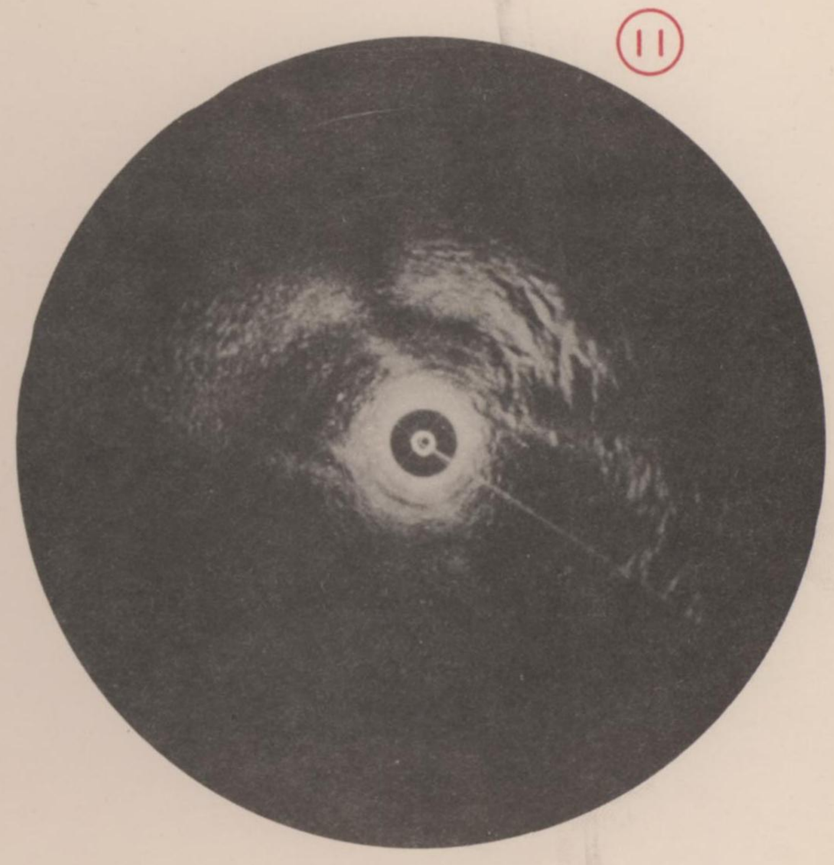

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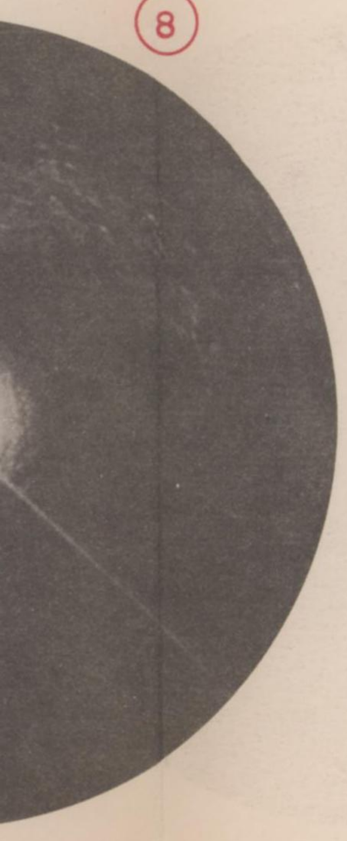

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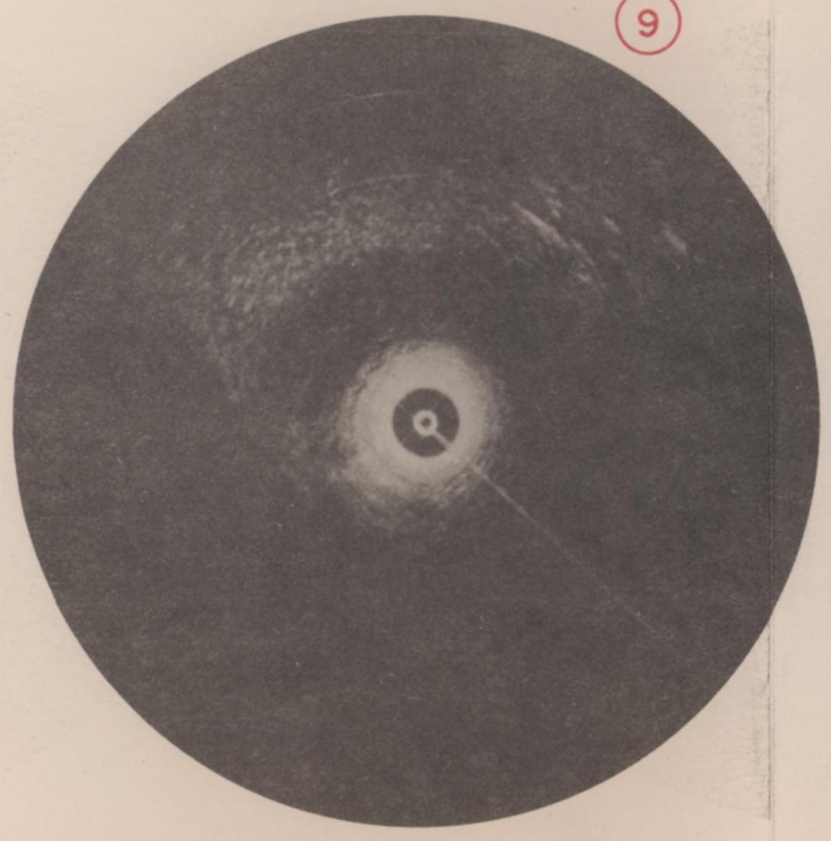

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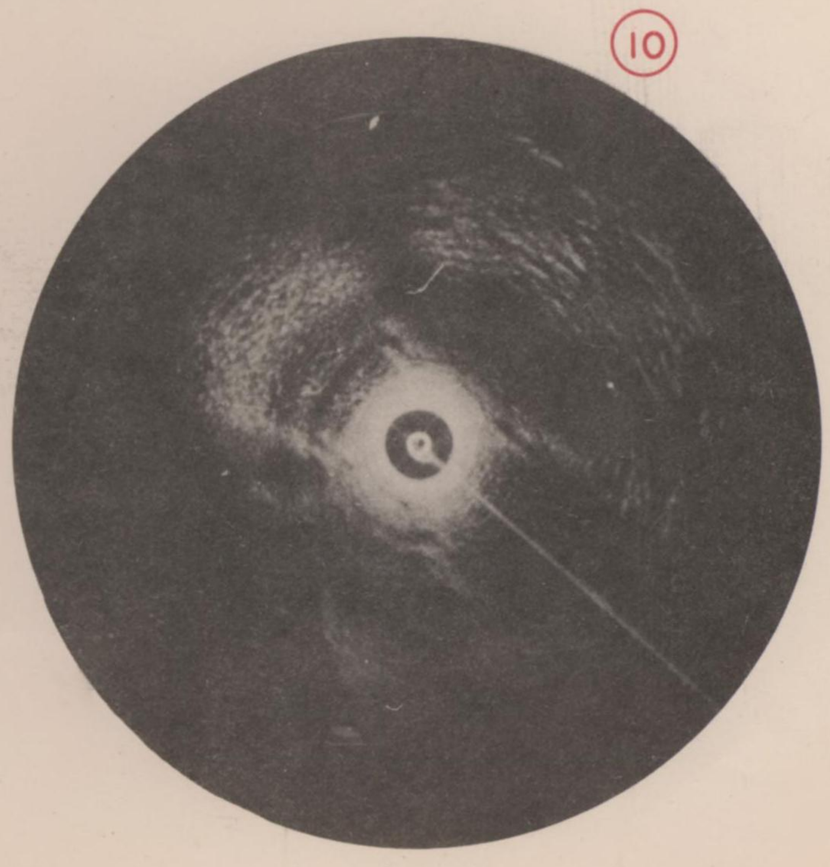

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By gw NARA Date 12/6/05

ANNEX

G

RCM INFORMATION

```
* * * * * * * * * * * * * * *
* Prepared by:               *
*                           *
*    RCM Section            *
*                           *
*      XX Bomber Command    *
* * * * * * * * * * * * * * *
```


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By gw NARA Date 12/6/05

S E C R E T

SECRET
Auth: Dep Com 20 AF.
Initials: MAP
Date: 27 Feb. 45

TWENTIETH AIR FORCE
Office of the Deputy Commander, IB & C
APO 493

27 February 1945

SUBJECT: RCM Report - Combat Mission No. 37 - Kuala Lumpur, 19 February 45, Daylight.

TO : Commanding General, Twentieth Air Force, Washington 25, D. C.

A. General

Fifty-nine aircraft were airborne on this mission. Of this number, five were equipped with RCM Search Equipment and monitored the early warning band enroute to and from the target and the radar fire control band while in the target area. In addition, the photo aircraft on the post strike mission was also equipped with RCM search equipment and a study of the Japanese early warning net was made after the main force had passed by.

Two Neisi (Americans of Japanese ancestry) participated in this mission, monitoring enemy fighter and fighter control frequencies.

B. Results

The Great Coco-Port Blair and the Penang-Medan early warning nets were in operation and RCM observers report being tracked by these radar sites. It is possible that the two fighter intercepts made prior to first bombs away may be attributed to these early warning nets. However, it is unlikely that the enemy knew our primary target believing the strike to be a normal mission against Singapore with the enemy fighters being merely local patrols.

1. Great Coco Radar: 196/970/8. This radar site is often logged as sweeping. On this mission, several observers reported the radar as tracking while other observers in the general area did not report the radar site at all. This would suggest a narrow antenna beam width and constant tracking of one formation, ignoring other formations. Enroute home, the radar was sweeping.

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Three cuts intersect at 93°23'E 14°06'N.

2. Port Blair Radar: 99/830/10.5. Four observers logged this radar site enroute to the target. D/F cuts suggest that the radar site is located near a marine navigation light on a small island at the mouth of the bay at approximately 92°46'E 11°40'N.

3. Penang Radar: 101/465/15. All observers logged this radar as strong and tracking, with first intercepts occurring as far as 175 miles from Penang. This radar appeared to be tracking when our search aircraft were in the target area.

This radar site is interesting inasmuch as the antenna has never been observed to rotate. This is not uncommon for the "CHI" radar sites located in China or the powerful 80 Mc. "CHI" sites as found in Rangoon. However, for a Mk 1 Model 1 to use a non-directional antenna suggests a new type and a deviation from the generally accepted bed spring antenna which sweeps from one to two revolutions per minute and has an estimated beam width of 18°.

It is not impossible that a non-directional antenna could serve a dual purpose: As a radar transmitting antenna; as a navigational aid for aircraft.

Due to the lack of radar shadow effect, it has been assumed that the radar is so situated that no mountain obstructs its sweep. If the radar were located on the mountain peak at Penang (100°16'E 5°25'N), 360° sweep would be possible. Three excellent sets of D/F cuts were obtained with the intersection o cuts as follows:

100°16'E 5°25'N	7 cuts
100°15'E 5°24'N	4 cuts
100°15'E 5°22'N	3 cuts

4. Medan Radar: 77/500/54. This radar site was also intercepted at an extreme range, with one observer taking a good cut on this radar site while 175 miles away. D/F cuts indicate Medan as the location of the radar.

5. Mergui Radar: 196/960/6. Enroute from the target this radar was logged for a period of 25 minutes. Three fair D/F cuts made from approximately 120 miles away intersect at 98°47'E 12°23'N.

6. (Possible) Moulmein Radar: 101/740/45. Enroute home, while in the Great Coco Island area, rough cuts were made on a Mk 1 Model 1 radar which intersect in the vicinity

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of Moulmein. It is possible that this is the same Mk 1 Model 1 reported on Combat Mission No. 34 to Saigon.

7. Mk 1 Model 3: 158/510/3.2. A possible shipborne radar was intercepted at 94°17'E 13°30'N. A land based Mk 1 Model 3 may be located on Marcondam Island at 94°16'E 13°26'N.

8. Mk 2 Model 1, Possible: 191/970/10. Rough bearings indicate a possible Mk 2 Model 1, shipborne radar in the Port Blair Area. It is also possible that this may be a land based Mk 1 Model 2.

9. No radar intercepts with radar fire control characteristics.

Post Flight Photo Mission

The following enemy radar data was obtained on the post flight photo mission which followed the main force by approximately 30 minutes:

1. Enroute to and from the target the Great Coco radar was logged as tracking momentarily and then searching. Rough D/F cuts were obtained.

2. A weak Mk 1 Model 1 radar was intercepted east of Port Blair. The Frequency of 96 Mc. suggests the previously reported radar site at Port Blair (97/780/10 Mission No. 33).

3. Penang Mk 1 Model 1 radar was logged for 2 hours and 51 minutes and at no time was the radar noted sweeping. Fair D/F cuts obtained.

4. Allied submarine radar intercepted. Fair D/F cuts obtained.

C. Enemy Countermeasures

No attempts at jamming were noted, however, two unidentified messages were received which may be attributed to the enemy as a deceptive measure.

D. Equipment

1. A receiver malfunction was corrected in flight by changing the 4th IF tube (6AC7).

2. Electrical drive unit on the AN/APA-24 D/F antenna failed after 10 hours of operation.

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3. Receiver antenna connection became loose - no signal.

4. The wide band Balun C2113 was used by one observer and a good cut obtained on the Medan Radar from a distance of 175 miles away. Attenuation was negligible.

E. Enemy Fighter Communications

1. This is the first time that Neisi were flown as combat crew members over Japanese held territory.

2. On this initial flight, only a few enemy fighters were encountered, therefore the amount of data obtained was very small and adds little to our present information.

FOR THE DEPUTY COMMANDER:

Leo I. Herman
LEO I. HERMAN
Colonel, Air Corps
Actg. Adjutant General

1 Incl:
RCM Search Aircraft Track and D/F Cuts.

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ANNEX

H

CENTRAL STATION FIRE CONTROL AND GUNNERY

Prepared by:

Staff Gunnery Officer

XX Bomber Command

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By gw NARA Date 12/6/05

HEADQUARTERS
XX BOMBER COMMAND
APO 493

CONSOLIDATED
SPECIALIST MISSION REPORT
OF STAFF GUNNERY OFFICER

Date Prepared: 22 Feb 45

F.O. No. 37
Date of Mission: 19 Feb 45

1. On the mission directed by Field Order #37, fighter opposition was considered very weak. The majority of an estimated 15 enemy fighters which opposed the B-29's were aircraft rated in the obsolescent or near obsolescent stage, such as Vals, Claudes and Nates. Enemy pilots were regarded as unskilled and unaggressive, as the majority of attacks were not pressed to close range.

2. The mission is considered as very satisfactory in regards to gunnery. All guns were test fired.

3. The following statistical data is submitted:

	444th	468th
Ammunition used test firing	2950	2640
Ammunition used in combat	1525	3185
Malfunctions of C.F.C. System	0	5
Total turrets on mission	135	140
Malfunctions of Cal. 50 MGS	1	3
Total MGS on mission	324	336
Total airplanes (basis of report)	27	28

Total percent malfunctions C.F.C. 1.8% Cal. 50 MGS less than 1%.

H-I-1

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ANNEX

I

CAMERAS AND PHOTOGRAPHS

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By gu NARA Date 12/6/05

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By ar NARA Date 12/6/05

I.- CAMERAS AND PHOTOGRAPHS

Mission No. 37

19 February 1945

	444th			468th			Total		
	K-18	K-20	K-22	K-18	K-20	K-22	K-18	K-20	K-22
No. cameras airborne	8	3	8	5	3	9	13	6	17
No. in A/C not bombing targets	1-a	0	1-a	0	0	0	1	0	1
No. in A/C bombing targets	7	3	7	5	3	9	12	6	16
No. in A/C photographing targets	7	*	6	4	3	7	11	*	13
Failure to photograph - mechanical	0	0	0	0	0	1-d	0	0	1
Failure to photograph - other reasons	0	0	1-b	1-e	0	1-e	1	0	2
Usable negatives	19	0-c	23	28	25	119	47	25	142

* Information not available or incomplete.

a. A/C 891 and 897 (444th) aborted

b. Film blank.

c. No usable negatives.

d. Sheared magazine.

e. Personnel failure

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By BW NARA Date 12/6/05

ANNEX

J

AIRCRAFT LOSSES AND DAMAGE

AIRCRAFT LOSSES AND DAMAGE

Mission No. 37

19 February 1945

1. There were no losses or damage of any kind on this mission.

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ANNEX

K

FUNCTIONING OF EQUIPMENT

I - Functioning of Equipment

II - Performance Data *

* Prepared by Staff Flight Engineer

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I - FUNCTIONING OF EQUIPMENT

Mission No. 37

19 February 1945

1.	A/C Airborne	59
2.	Less A/C failing to bomb primary target - mechanical	2
	a. Bombed secondary target	
	(1) A/C 272 (468th) - #2 prop governor stuck	
	b. Bombed last resort target	
	(1) A/C 580 (444th) - fuel transfer system out	
3.	Less A/C failing to bomb primary target - other reasons	8
	a. Personnel error	
	(1) A/C 897 (444th) - bomb bay motors burned out. Bomb bay door switch misused for flap switch.	
	(2) A/C 891 (444th) - Access door came loose. Door not tightened correctly.	
	(3) A/C 730 (444th) - Miscalculation. Thought they were bombing primary target. Poor target charts.	
	(4) A/C 524 (444th) - Same a s A/C 730.	
	(5) A/C 422 (444th) - Same as A/C 730.	
	(6) A/C 273 (444th) - Same as A/C 730.	
	(7) A/C 417 (468th) - Miscalculation on available fuel. 600 gallons in center wing tank over-looked.	
	(8) A/C 532 (468th) - Arrived at assembly point too late to join formation.	
4.	A/C bombing primary target	49

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HEADQUARTERS
XX BOMBER COMMAND
APO 493

SECRET
Auth: CG XX BC
Initials: [illegible]
Date: 22 Feb. 45

CONSOLIDATED SPECIALIST MISSION REPORT
OF STAFF FLIGHT ENGINEER

Date Prepared: 22 February 1945

Field Order Number 37
Date of Mission: 18 Feb 45

1. The summary of performance of the aircraft bombing the primary target is contained in the attached table.

2. The 468th Bombardment Group loaded two more bombs per aircraft than the 444th Bombardment Group by removing the nose fuse of the bombs loaded under the auxiliary bomb bay tank.

3. Due to overcast conditions at the target the bombing altitudes were between 11,000 feet and 13,000 feet, which resulted in fuel reserves greater than anticipated.

Attached: 1 Table

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SUMMARY OF PERFORMANCE
Field Order No. 37
Primary Target

		Overall	444th Gp	468th Gp
*No. of aircraft		48	22	26
Total time		15:37	16:15	15:05
Time to target		8:19	8:41	8:00
Fuel burned	Average	6475	6520	6435
	Maximum	6850	6850	6700
	Minimum	6100	6250	6100
Fuel carried	Average	7300	7300	7300
	Maximum	7300	7300	7300
	Minimum	7300	7300	7300
Burnable Reserve	Average	825	780	865
	Maximum	1200	1050	1200
	Minimum	450	450	600
**Air Miles		3437	3488	3394
Ground Miles		3380	3410	3277
Gal/Air Mile		1.89	1.87	1.89
***Bombing Altitude		12,250	11,250	13,100
Starting Gross Weight	Average	133,630	132,890	134,230
	Maximum	135,173	133,587	135,173
	Minimum	132,129	132,129	133,365
Weight of Bombs	Average	7,220	6,120	8,160
	Maximum	8,160	6,120	8,160
	Minimum	6,120	6,120	8,160
No. of Bombs, M65		7.1	6	8

*Aircraft that bombed primary and returned to their own base for which logs were available.

**Accuracy of air miles is doubtful due to difficulties in determination.

***Pressure altitude.

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ANNEX

L

TARGET DAMAGE ASSESSMENT

* * * * * * * * * * * * * * * * * *
* Prepared by: *
* *
* Target Intelligence Unit *
* *
* XX Bomber Command *
* * * * * * * * * * * * * * * * * *

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By gw NARA Date 12/6/05

C O N F I D E N T I A L

HEADQUARTERS
XX BOMBER COMMAND
Intelligence Section
APO 493

5 March 1945

DAMAGE ASSESSMENT REPORT NO. 44

TARGET: Central Workshops of the Malayan Railways, Kuala Lumpur, Malaya. (03° 11'N -- 101°41'E)

GENERAL STATEMENT:

This report relates to damage resulting from a daylight attack by 49 aircraft of the XX Bomber Command on 19 February 1945. A total of 346 M-65 1000 lb. GP bombs fused 0.1 second nose and 0.025 second tail were dropped. Assessment of damage was derived from good quality photos obtained by the 462nd Bomb Group, XX Bomber Command, on 27 February 1945.

The attack was accomplished by fifteen formations of from two to four planes each, and one single plane attack, over the target from 0249Z to 0413Z. Weather encountered over the target area varied from CAVU to 3/10 undercast. Bombing altitudes ranged from 11,000' to 13,700', with all bombing accomplished visually.

Of the total of approximately 784,500 sq. ft. of buildings comprising the plant some 57.5% suffered structural damage* and 9% suffered superficial damage* for a total over-all damage to the works of approximately 67%. Heaviest damage occurred in the northern two-thirds of the plant where virtually all of the workshops are located. This area, termed "Functional Area" (See Annex 1 Ground Plan), is comprised of approximately 621,400 sq. ft. of buildings of which 69% were structurally damaged and 11% were superficially damaged. The southern one-third, Administrative and Stores Area, suffered only light damage there being approximately 7% of structural damage and 1% of superficial damage.

The damage sustained by the primary buildings of the "Functional Area" is tabulated below. (Building numbers are coded to Annex 1 Ground Plan).

Building Number	Function	Superficial* Damage	Structural* Damage
23	Locomotive Store and Coppersmith Shop	24.2%	18.0%
25	Power House Sub-station		100.0%
26	Brass and Iron Foundry	23.3%	13.7%
28	Erecting and Machine Shops	14.0%	52.5%
34	Traverser	17 hits	
37 a,b,c	Saw Mill and Wagon Body Shop	12.2%	87.7%
37 d,e	Boiler and Smith Shop		100.0%
38	Carriage Shop		100.0%
39	Electric Repair Shop		100.0%
40	Carriage Painting Shop		100.0%

In addition to the great damage inflicted on the workshops heavy damage occurred to trackage and rolling stock especially in the main marshalling area in the N portion of the plant. Approximately 105 rolling stock and 6 locomotives were destroyed or damaged.

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Non-industrial damage was limited, there being 3 dormitory type buildings and 6 residences either destroyed or heavily damaged.

* Structural damage includes damage which involves the replacement of a principal structural or supporting member. Normally damage of this nature may be considered "destroyed". Superficial damage covers other types of damage of varying degrees of severity all of which could be repaired without involving extensive structural replacement.

REFERENCES: (1) XX Bomber Command Ground Sketch No. 92.1-56 from "Far Eastern Review", February 1937, Vol. 33, No. 2.

WEIGHT OF ATTACK: 49 Aircraft
346 M-65 1000 lb. GP bombs.

PHOTOGRAPHY: (1) Strike Photos 5MB37, 19 February 1945, quality and scale variable.
(2) XX Bomber Command 5MR33, 19 February 1945, scale approximately 1:15,000, quality good.
(3) XX Bomber Command 5MR38, 27 February 1945, scale approximately 1:6,500, quality good.

ANNEXES: (1) Damage Plan, "Before" and "After" photos.
(2) Bomb Fall Plot.

DETAILS OF DAMAGE: For details of damage see Damage Plan, Annex 1.

Frank L. Scott Jr

FRANK L. SCOTT, JR
Colonel, Air Corps,
Chief, Intelligence Section.

PREPARED BY: TARGET UNIT
INTELLIGENCE SECTION

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By SR NARA Date 12/6/05

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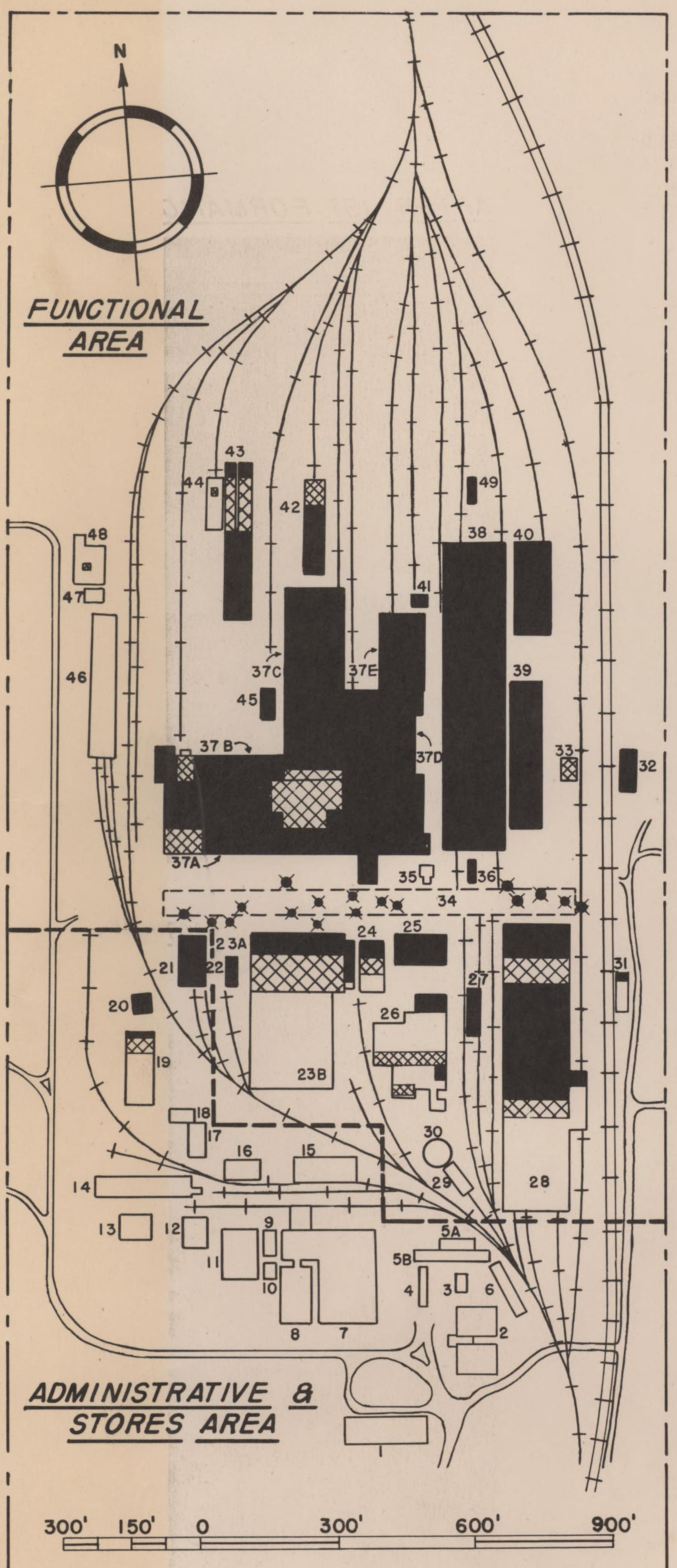


LEGEND

19 -	CEMENT STORE	37-	SAW MILL, WAGON BODY, BOILER, SMITH SHOPS, WELDING DEPOT
23A -	LOCOMOTIVE IRON STORE		
23B -	COPPER SMITH SHOP		
24 -	BRASS SCRAP STORE	38-	CARRIAGE SHOPS
25 -	POWER HOUSE, SUB-STATION	39-	ELECTRIC REPAIR SHOP
26 -	BRASS AND IRON FOUNDRY	40-	CARRIAGE PAINT SHOP
27 -	LOCO. TESTING SHOP	42-	WAGON PAINTING SHED
28 -	ERECTING & MACHINE SHOP	43-	TIMBER SCANTLING SHED
33 -	CELL CHARGING SHOP	45-	PAINTING SHED
34 -	TRAVERSER		

DAMAGE KEY

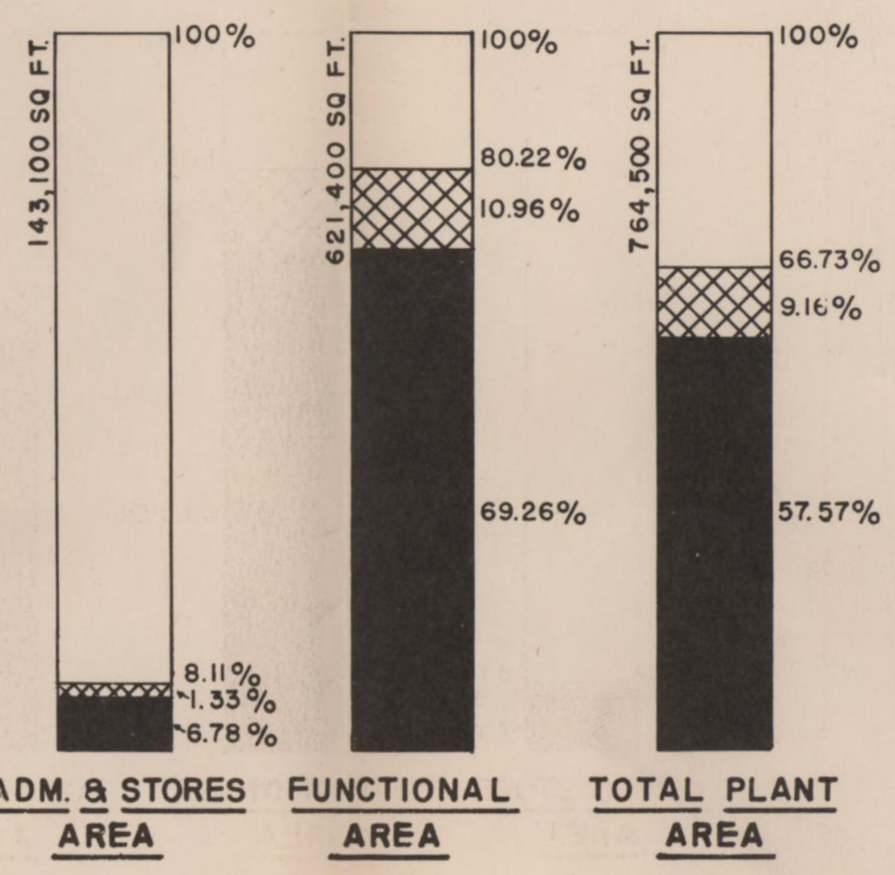
STRUCTURAL OR TOTAL DAMAGE

SUPERFICIAL DAMAGE

UNDAMAGED

SINGLE BOMB CERTAIN WITH CRATER

PERCENTAGE OF DAMAGE



ADM. & STORES AREA | FUNCTIONAL AREA | TOTAL PLANT AREA

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ANNEX I
D.A. REPORT NO. 44
CENTRAL R.R. WORKSHOPS
KUALA LUMPUR, MALAYA

TARGET UNIT, XX B.C.

D

- SAW MILL, WAGON BODY, BOILER, SMITH SHOPS, WELDING DEPOT
- CARRIAGE SHOPS
- ELECTRIC REPAIR SHOP
- CARRIAGE PAINT SHOP
- WAGON PAINTING SHED
- TIMBER SCANTLING SHED
- PAINTING SHED

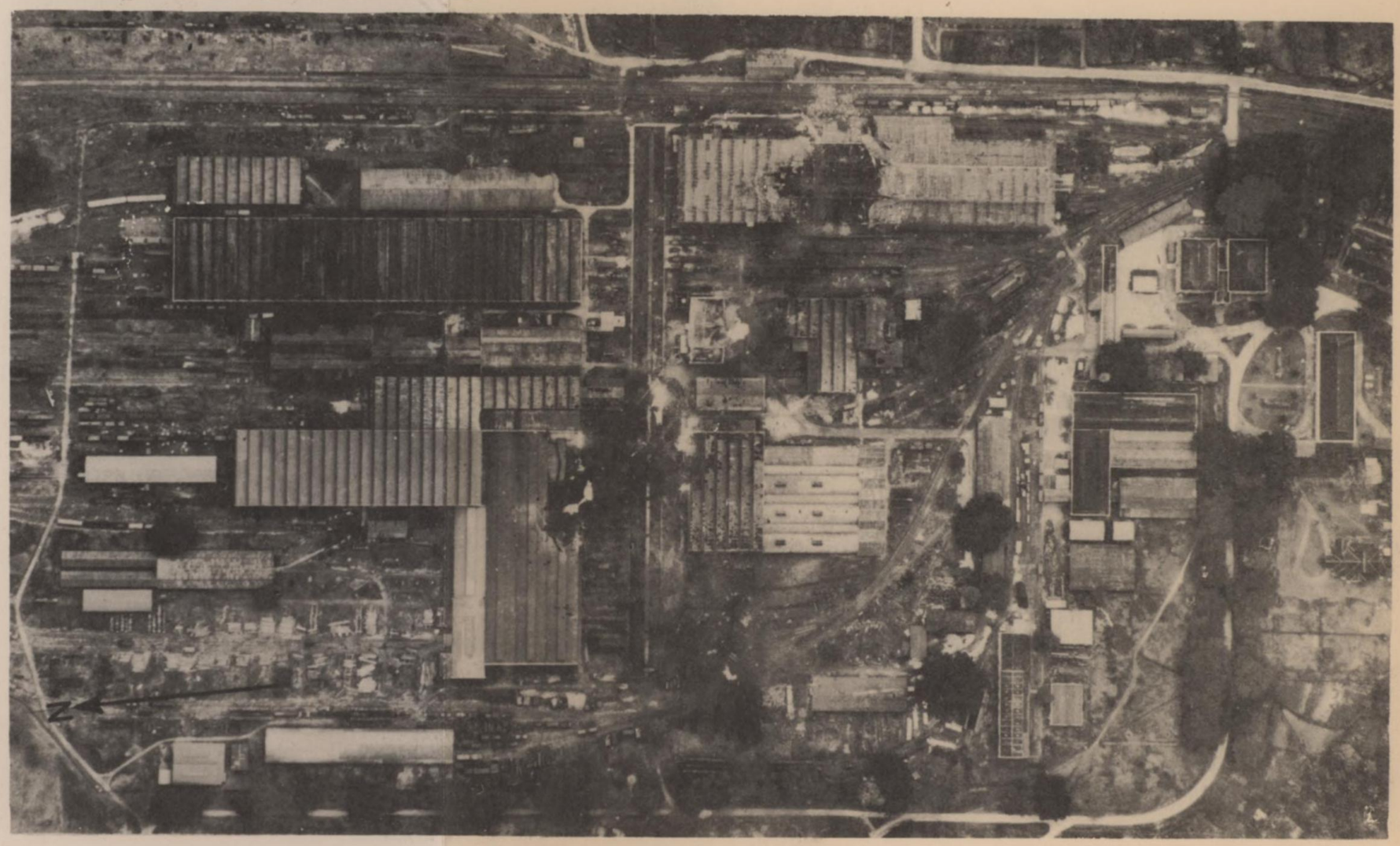
KEY

TOTAL DAMAGE

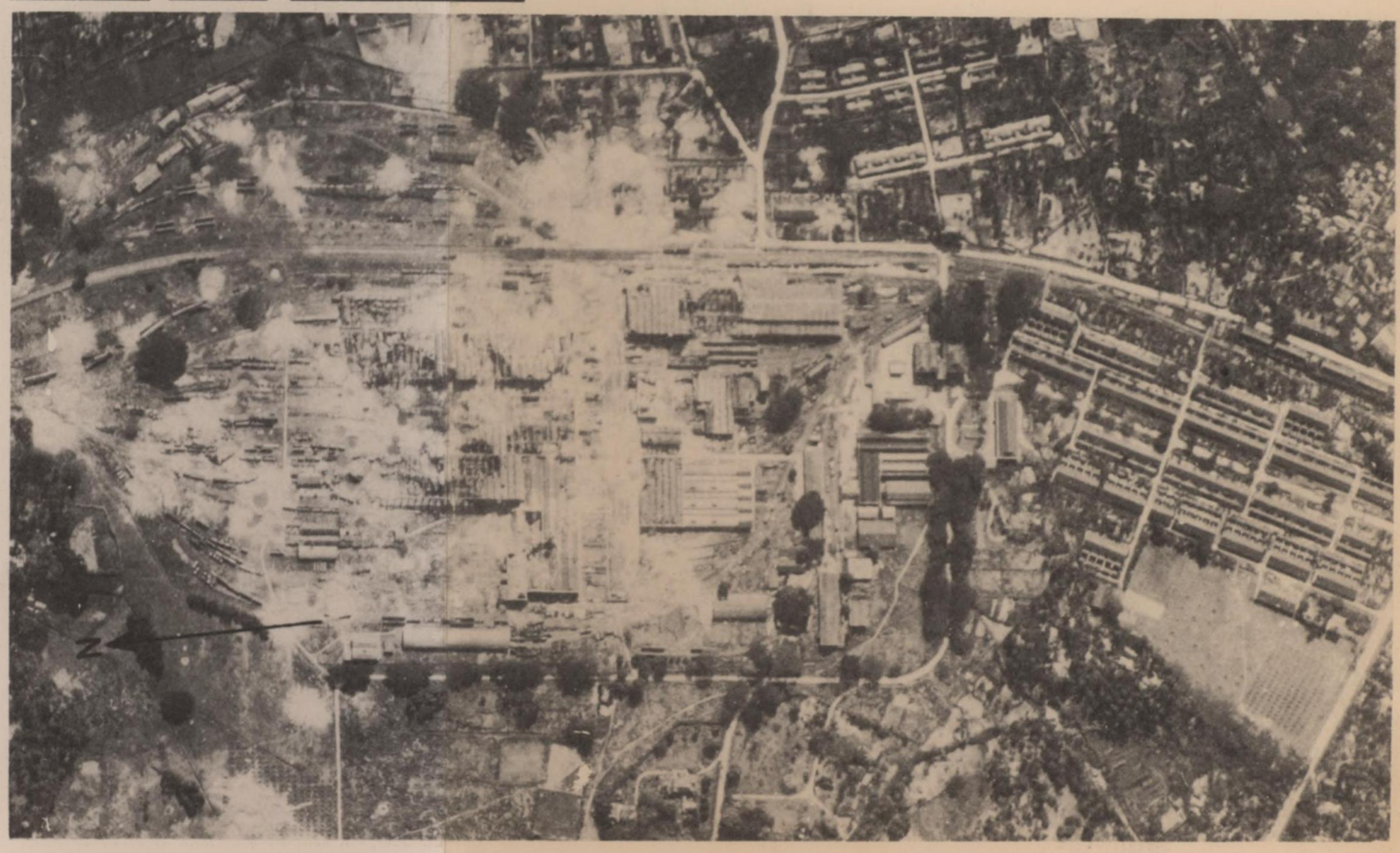
AGE

TAIN WITH CRATER

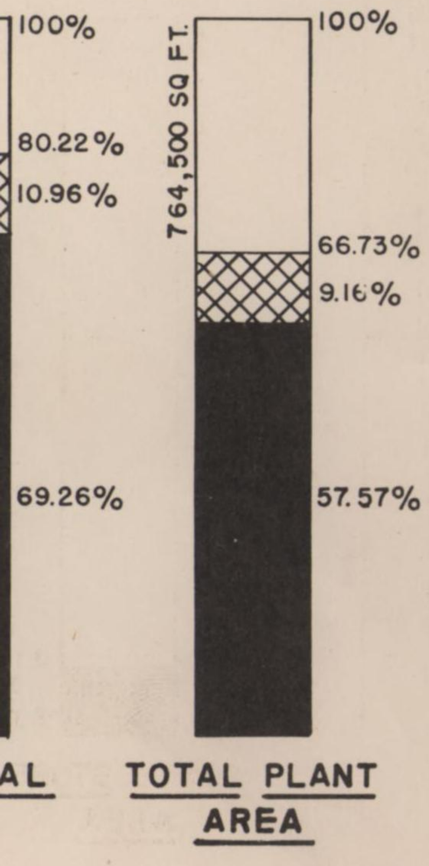
AFTER 1ST FORMATION



AFTER LAST FORMATION



F DAMAGE



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ANNEX 2
D.A. REPORT NO. 44
CENTRAL R.R. WORKSHOPS
KUALA LUMPUR, MALAYA
TARGET UNIT, XX B.C.

BOMB PLOT

NO. OF BOMBS DROPPED : 346
NO. OF BOMBS IDENT. : 264 - 76.3 %

AREA	NO. OF BOMBS	%
0 - 1000'	179	67.8
1 - 2000'	57	21.6
2 - 3000'	22	8.3
3 - 4000'	6	2.3
4000' PLUS	0	0

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By gw NARA Date 13/6/05

ANNEX

M

CONSOLIDATED MISSION STATISTICAL SUMMARY

Prepared by:

Statistical Control Section

XX Bomber Command

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Authority NND 760063 By NARA Date 12/6/05

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XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

SECRET
By Authority of the
Commanding General:

5-3-45 SK
Date Initials

Table I and II - Aircraft Participating *

Group	Mission No.	Field Order No.	** A/C Taking Off	Airborne A/C Failing to Bomb Designated Primary Target								Time Of First Takeoff	Time*** Of Latest Return	Average Time of Flight***	
				Total No.	Percent	Reason								A/C Bombing Primary	Airborne A/C Not Bombing Primary
						Mech.	Pers.	Wea.	Not in Form.	Misc.	Unknown				
444th	37	37	30	7	23.3%	1	6					1755Z	1114Z	16:15	11:30
468th	37	37	** 29	3	10.3%	1	2					1902Z	1130Z	15:21	13:13
TOTAL	37	37	59	10	16.9%	2	8					1755Z	1130Z	15:46	11:53

* Mission was run from Rear Area Bases; Tables I and II consolidated because there was no Rear to Forward Area Movement.
** Field Order #37 required each Group to furnish 30 aircraft on mission. A/C 63464 of the 468th Group failed to takeoff because of low manifold pressure on #4 engine.
*** Excludes A/C which landed at other fields.

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S E C R E T

XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

By Authority of the
Commanding General:

Date Initials

Table III - Bombing Runs

Group	No. of A/C Bombing	Target Bombed	Time of Release		Altitude of Release		Visual Bomb A/C Sighting For	Radar Bomb A/C Sighting For	Blind Bomb A/C Sighting For	On the Leader			A/C Dropping On	
			Earliest	Latest	Highest	Lowest	R&D Range	R&D Range	R&D Range	Visual	Radar	Blind	AFCE	Manual
444th	23	Kuala Lumpur	0249Z	0331Z	12000	11000	6			17			6	17
	1	Martaban	0205Z	0205Z	15000	15000	1						1	
	4	Opportunity	0247Z	0247Z	12000	12000	1			3			1	3
468th	26	Kuala Lumpur	0313Z	0415Z	13700	10400	10			16			10	16
	3	Alor Star	0227Z	0313Z	16800	13370	3						3	
TOTAL	49	Kuala Lumpur	0249Z	0415Z	13700	11000	16			33			16	33
	3	Alor Star	0227Z	0313Z	16800	13370	3						3	
	1	Martaban	0205Z	0205Z	15000	15000	1						1	
	4	Opportunity	0247Z	0247Z	12000	12000	1			3			1	3

Primary Target - Kuala Lumpur.
Secondary Targe t - Alor Star Airfield.
Last Resort - Martaban.

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By RW NARA Date 12/6/05

S E C R E T

XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

S E C R E T
By Authority of the
Commanding General:

Date Initials

Table IV - Bomb Loading & Disposal

Group	* Type of Bombs	Bomb Loading on A/C Airborne in R.A.				On Targets				Bomb Disposal		
		Fusing		Average No. Loaded	Total Loaded	Kuala Lumpur	Alor Star	Martaban	Opportunity	Jettisoned	Returned	Unknown
		Nose	Tail									
444th	1000# G.P.	.1	.025	6	180	138		6	24	6	6	
468th	1000# G.P.	.1	.025	8	232	208	24					
TOTAL	1000# G.P.	.1	.025	7	412	346	24	6	24	6	6	

* 1000# G.P. AN-M65 -- Actual weight 1019.4 pounds.

NOTE: Bomb weight information supplied by Ordnance Section, XX Bomber Command.

S E C R E T

S E C R E T
By Authority of the
Commanding General:

2-3-45 SK
Date Initials

XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

Table V - Aircraft Lost and Damaged

Aircraft Lost

NEGATIVE REPORT

Aircraft Damaged

Major Damage

NEGATIVE REPORT

Minor Damage

NEGATIVE REPORT

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XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

S E C R E T
By Authority of the
Commanding General:

Date Initials

Table VI - Attacks & Passes by Enemy Aircraft

DIRECTION	ALTITUDE							
	HIGH		LOW		LEVEL		TOTAL	
	444th	468th	444th	468th	444th	468th	444th	468th
0800								
0900	1						1	
1000		4						4
1100		1				1		2
1200	1	9		1			1	10
0100	2						2	
0200	1						1	
0300		2				1		3
0400								
0500	1	2					1	2
0600								
0700								
TOTAL	6	18		1		2	6	21

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By ar NARA Date 12/6/05

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XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

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By Authority of the
Commanding General:
3-3-45 SK
Date Initials

Table VII - Personnel Losses

Crew Position	Killed		Missing		Seriously Wounded		Slightly Wounded		Total Casualties		Total Participating	
	444th	468th	444th	468th	444th	468th	444th	468th	444th	468th	444th	468th
Pilot											30	33
Co-Pilot											30	28
Navigator											30	30
Bombardier											30	29
Flt. Engr.											30	29
Radar											30	30
Radio					NEGATIVE REPORT						30	29
CFC Spec											30	29
Right Gnr											30	29
Left Gnr											30	29
Tail Gnr											30	29
R C M												3
Others											13	6
TOTAL											343	333

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By ar NARA Date 12/6/05

XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

S E C R E T
By Authority of the
Commanding General:
2-2-45 SK
Date Initials

Table VIII - Expenditures of Ammunition and Claims Against Enemy Aircraft

Group	Ammunition Expended Per Plane In Combat Firing					Total Expended	Claims Against Enemy Aircraft					
										Per 1000 Pounds Expended in Combat		
	Upper Front	Lower Front	Upper Rear	Lower Rear	50 Cal. Tail		Destroyed	Probably Destroyed	Damaged	Destroyed	Probably Destroyed	Damaged
444th	22	3	21		5	1515	0	0	3			1.98
468th	52	13	29	6	13	3285	1	0	4	.30		1.22
TOTAL	37	7	25	3	9	4800	1	0	7	.21		1.46

DECLASSIFIED
Authority NND 760063
By RW NARA Date 12/6/05

XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
Mission Number Thirty Seven
19 February 1945

S E C R E T
By Authority of the
Commanding General:
3-3-45 EK
Date Initials

Table IX - Gasoline Loading and Consumption

Group	Average Gross Weight Per Plane Before Rear Area Takeoff	Average Gals Gas Loaded Per A/C Before Rear Area Takeoff	* Average Gallons Consumed on Mission		*Average Gallons Remaining in A/C After Mission	
			Per Aircraft Bombing Primary	Per Aircraft Not Bombing Primary	Per Aircraft Bombing Primary	Per A/C Not Bombing Primary
444th	132786	7300	6520	4738	780	2562
468th	134232	7300	6438	5838	862	1462
TOTAL	133495	7300	6476	4982	824	2318

* Excludes A/C which did not return directly to home fields.

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XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
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Table X - Airborne A/C Failing to Bomb Primary Target

A/C Serial Number	Specific Mechanical Malfunctions	Other Reasons	Local Action To Prevent Recurrence
444th Group			
24580	Fuel Transfer System Inop.		Changed fuel transfer pumps. UR #45-90 submitted.
24897		Bomb bay motors burned out. Bomb bay door switch misused for flap switch on take-off. Personnel error.	
24891		Access door came loose. Door not tightened correctly. Personnel error.	
24730		Miscalculation. Thought they were bombing Primary Target. Poor target charts. Personnel error.	
24524		Same as A/C 730.	
63422		Same as A/C 730.	
65273		Same as A/C 730.	
468th Group			
65272	#2 Prop Governor stuck at 2400.		Chronic trouble. Unit turned over to depot for overhaul. No UR submitted.
63417		Miscalculation on available fuel. 600 gallons in Center Wing Tank overlooked. Personnel error.	
63532		Personnel error. Arrived at Assembly Point too late to join formation.	

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XX BOMBER COMMAND
CONSOLIDATED MISSION STATISTICAL SUMMARY
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Table XI - Engineering Malfunctions

Part I - Engineering Malfunctions Preventing Airborne A/C From Bombing Primary

		444th	468th	Total
PROPELLERS & GOVERNORS	Governor		1	1
FUEL SYSTEM	Fuel Transfer System	1		1
TOTAL		1	1	2

NOTE: For Details, see Table X - "Summary of A/C Failing to Bomb Primary".

Part II - Engineering Malfunctions Not Preventing A/C From Bombing Primary

		444th	468th	Total
POWER PLANT & ACCESSORY SECT.	Engine Running Rough.	1	1	2
	Engine Running Hot.	1		1
	Turbo Supercharger and/or Turbo Control System		1	1
PROPELLERS & GOVERNORS	Feathered Props	1		1
	Governor	1	1	2
OIL SYSTEM	Oil Leaks	1		1
	Oil Temperature Regulator	2		2
	Oil Pressure Low		1	1
	Oil Pressure High	2		2
FUEL SYSTEM	Fuel Leak		1	1
	Carburetor	2		2
	Fuel Pressure High		1	1
ELECTRICAL SYSTEM	Generators		3	3
	Voltage Regulator	2	1	3
	Landing Lights	1		1
	Magneto	1		1
	Generator Volt Meter		1	1
	A. P. U.		1	1
INSTRUMENTS	Carb. Air Temp. Gage		1	1
	Cylinder Head Temp. Gage	1	1	2
	Rear Oil Press. Gage	1	1	2
	Fuel Press Gage	1		1
	Tachometer	5		5
	Flux Gate Compass	1	1	2
	Airspeed Indicator		1	1
	Flight Indicator	1	1	2
	AFCE	2		2

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Table XI - Part II (cont'd)

	444th	468th	Total
MISCELLANEOUS			
Landing Gear	1		1
Vacuum System		1	1
TOTAL	28	19	47

NOTE PERTAINING TO BOTH PART I AND PART II:

Only engineering malfunctions are listed. All other malfunctions, such as radar, are excluded. If one aircraft had more than one engineering malfunction, all malfunctions have been listed.

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Table XII - Utilization of Useful Load
(Based on A/C Bombing P.T.)

Group	No. of Ground Miles	Number of A/C Considered	Type of A/C	Av. Gross Weight at Takeoff for Mission	Aver Basic Weight of A/C	Aver. Useful Load	Aver. Number of Bombs Loaded	* Aver Weight of Bombs Loaded	Aver Weight of Gas Loaded at 6 Pounds Per Gal	Average Miscellaneous Weight
444th	3410	23	Center Wing Tanks	132867	75425	57442	1000# GP 6	6116	43800	7526
468th	3277	26	Center Wing Tanks	134247	75000	59247	1000# GP 8	8155	43800	7292
TOTAL	3380	49	Center Wing Tanks	133599	75199	58400	1000# GP 7.1	7198	43800	7402

* 1000# G.P. - AN-M 65 equals 1019.4 pounds.

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3	Chief of Staff, XX Bomber Command
4	Chief, Intelligence Section, XX Bomber Command
5	Commanding Officer, 40th Bombardment Group
6	Commanding Officer, 444th Bombardment Group
7	Commanding Officer, 462nd Bombardment Group
8	Commanding Officer, 468th Bombardment Group
9 - 38	Commanding General, Army Air Forces; Attention AC/AS Intelligence, Collection Division
39	Assistant Chief Air Staff, Intelligence
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Tr. M. ?
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8-10
12-15

Note:
See Maj Boss about where these came from
Capt. James could use these in his file — Maj Boss says OK for Capt James' file.

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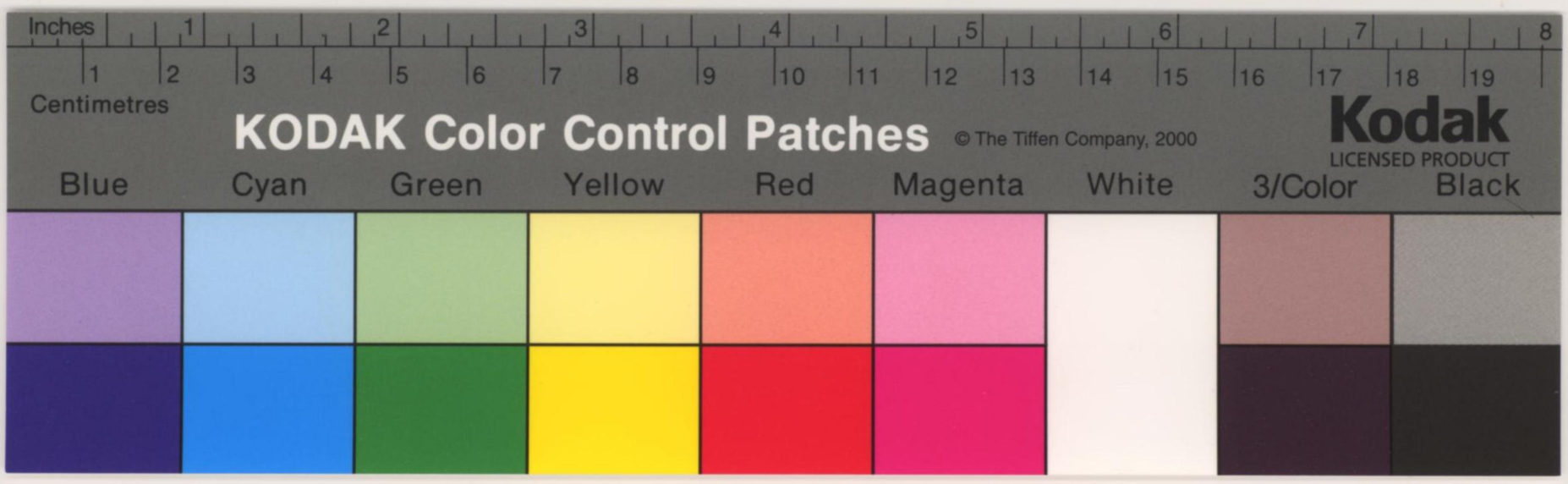

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