

# Folder No. 3

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By **VAN** NARA Date **12-8**

MISSION #41 Singapore PILICAN 5  
2 March 1945

2-5239-70

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Chief of Staff	
Deputy C. of S. P & A	
Deputy C. of S. Ops	
Deputy C. of S. T. & S. E.	

# XX Bomber Command



## Tactical Mission Report

No. 41

DATE 2 MARCH 1945

GENERAL OF THE ARMY H. H. ARNOLD

COPY No. 1

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

The following named Exhibits, Annexes, and Reports included in this Tactical Mission Report, originally classified SECRET, are hereby reclassified to CONFIDENTIAL.

By authority of Commanding General, XX Bomber Command

26 March 1945  
Date

J. L.  
Initials

Track and Vertical Flight Path

Consolidated Specialist Mission Report of Staff Bombing Officer

Consolidated Specialist Mission Report of Staff Navigation Officer

Annex B - Enemy Antiaircraft

Annex C - Enemy Air Opposition

Weather Chart (as forecast and as encountered)

Synoptic Map

Annex E - Communications Information

Annex F - Radar Information

Annex G - RCM Information

Annex H - Central Station Fire Control and Gunnery

Consolidated Specialist Mission Report of Staff Flight Engineer

Summary of Performance Sheet

Annex M - Consolidated Mission Statistical Summary

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

TACTICAL MISSION

REPORT

Field Order No. 41

Mission No. 41

TARGET: NAVAL BASE, SINGAPORE,  
MALAYA

Table of Contents

Tactical Narrative Report  
Annex A: Execution of the Mission  
Annex B: Enemy Antiaircraft  
Annex C: Enemy Air Opposition  
Annex D: Weather Information  
Annex E: Communications Information  
Annex F: Radar Information  
Annex G: RCM Information  
Annex H: Central Station Fire Control and Gunnery  
Annex I: Cameras and Photographs  
Annex J: Aircraft Losses and Damage  
Annex K: Functioning of Equipment  
Annex L: Target Damage Assessment  
Annex M: Consolidated Mission Statistical Summary

Prepared by

Intelligence Section

XX Bomber Command

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

23 March 1945

SUBJECT: Report of Operations, 2 March 1945.

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

1. UNITS PARTICIPATING: The four Bombardment Groups of the XX Bomber Command were directed by Field Orders Number 41 to participate in a daylight strike against the Singapore Naval Base. Groups, their locations, and their Commanding Officers were as follows:

<u>Group</u>	<u>Base</u>	<u>Commanding Officer</u>
40th	Chakulia	Colonel W.K. Skaer
444th	Dudhkundi	Colonel A.L. Harvey
462nd	Piardoba	Colonel A.F. Kalberer
468th	Kharagpur	Colonel J.V. Edmundson

2. IDENTIFICATION OF THE MISSION:

a. Attack No. 41.

b. Targets specified:

- (1) Primary Target: Shops and warehouses in the Singapore Naval Base Area, Singapore, Malaya (Objective Folder 92.2-21, and AAF target Chart No. 92.2-21).
- (2) Primary Radar Target: Bukum Island Tank Farm, Singapore Area (AAF Target 92.1-72)
- (3) Secondary Target: Malayan Collieries, Batu Arang, Malaya (Objective Folder 92.1-50)
- (4) Last Resort Target: Main Hutted Area, Khow Hwang Thailand (Objective Folder 98.3-a and XX Bomber Command Target Chart 98.3-A).

3. STRATEGY AND PLAN OF OPERATIONS:

a. Importance of Targets:

(1) Primary Target: The Singapore Naval Base is of obvious importance to the operations of the Japanese fleet in southern waters. The anchorage is large enough to shelter any number of ships, has ample fueling and supply facilities, and is capable of performing any repair work. The workshop area, located east of the King George VI Drydock, contains an electric power station and workshops in line about 2700 feet long. Included are a locomotive shed, boiler shop, foundry, 2 metal shops, machine shop, bending floor, electrical engineering shop, and submarine battery shop, all fully equipped and capable of handling any ship's work. There are also ~~numerous~~ railroad spurs and warehouses in the area.

- 1 -  
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Authority NND 760063

By VAN NARA Date 12-8

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(2) Primary Radar Target: Bukum Island supports 45 usable oil tanks with a total storage capacity of 1,250,000 barrels. The chief function of the tank farm on this and adjacent islands has normally been to handle the export of petroleum products from the Palembang refineries in Sumatra. Since the bar across the Moesi river in Sumatra is too shallow to allow the passage of fully loaded ocean going tankers, these vessels secure a partial cargo at Palembang and proceed to Bukum or one of the other two islands off Singapore where they load to capacity before sailing to their final destinations. The tank farms on the islands are themselves supplied from Palembang by small tankers, oil barges, and wooden junks. As the Singapore area is largely cut off from Japan by the Allied air and sea blockade, the tank farms on Bukum and the other islands probably now serve mainly to store fuel oil for enemy shipping in southern waters. Total destruction of the three island tank farms would force ships to proceed into Singapore harbor to obtain their fuel as well as destroying over 1 1/2 million barrels of oil which would cause the Japanese some inconvenience although tank farms on Singapore Island itself have a capacity of around 5 million barrels which is more than ample to care for Japanese storage requirements. Fuel oil supplies from Singapore can be replenished from Palembang with little difficulty.

(3) Secondary Target: The Malayan Collieries comprise the sole source of coal on the peninsula and produce an average of 600,000 metric tons a year or about one half of the annual consumption in Malaya. The coal is low grade sub-bituminous type and is used largely by railroads and to some extent by electric power stations. It is unsuitable for ship's bunkers.

The mine is highly mechanized, possessing electric drills, cutters, conveyors, ventilating system pumps, and other machinery all of which depend on the 53,000 kilowatt power plant located on the property. Destruction of the power plant would halt all mining operations by electrically powered machinery until repairs could be effected or an alternate source of power obtained. The temporary loss of coal output would reduce the amount of fuel available to the Malayan railway system and decrease its efficiency in serving the Japanese.

(4) Last Resort Target: Khao Huagang is the western terminus of the Kra Isthmus Railroad which originates at Chumphon on the Bangkok-Singapore Railroad and provides access to the Bay of Bengal via the Pakchan River. Supplies arriving at Chumphon by sea or rail from Bangkok or Singapore can be sent across the Kra Isthmus to Khao Huagang where they are transferred to small vessels for shipment to Burma. Supplies awaiting transportation are stored on the target area and their destruction will reduce the capabilities of the Japanese in this theatre.

b. Details of Planning:

(1) Operational Planning:

(a) It was originally planned to utilize 60 sorties for an attack on the Hongkong area, but these plans were cancelled at the request of Major General Chennault due to the increased tonnage requirements and the consistent bad weather in China. It was then decided to use the available sorties to attack the most important remaining target in the Singapore area. Due to limited maintenance facilities available to the 40th and 462nd Groups, each was required to furnish only 10 aircraft. The 444th and 468th Groups were ordered to furnish only a medium force of 20 aircraft each because of other commitments made for the same time. The targets selected were the workshops and warehouses in the Singapore Naval Base area and it was felt that a medium effort of 60 aircraft would be sufficient for their destruction.

- 2 -  
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Authority NND 760063

By VAN NARA Date 12-8



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(b) The Singapore Naval Base as a target presented several operational difficulties. The proximity of the target to the King George VI Drydock made it necessary to guarantee to the Supreme Allied Command that no premeditated damage would be inflicted upon the dry dock before permission would be granted to use the Naval Base Area as a target. In order to avoid damaging the dock it was necessary to use an axis of attack of 109 degrees and bomb by 3 plane formations. This axes of attack was undesirable because of the position of the sun. Three plane formations were necessary to avoid a large bomb pattern which might result in hits on the drydock.

(c) Due to the rectangular shape of the target area it was necessary to employ two aiming points and split the striking force with each half of the force using a different aiming point. This would serve to minimize the danger of hitting the dry dock.

(d) Group Commanders were given specific instructions to avoid bombing the primary target by means of radar. In the event of cloud cover aircraft were to proceed on the bomb run to a point well beyond the target proper at which point a turn of approximately 190 degrees was to be made followed by a run over the primary radar target, the Bukum Island oil tank farm.

(e) Prior to D-day Group Commanders requested that the required number of aircraft from each Group be adjusted in order to insure all 3 plane formations. As a result of this request the 444th and 468th Groups were instructed to furnish 21 instead of 20 aircraft and the 40th and 463th Groups 12 instead of 10 aircraft.

(2) Determination of Bomb Load:

(a) As a means of reducing the damage that might be inflicted by a stray bomb or bombs in the area of the King George VI Dry Dock, it was agreed that 500 pound G.P. bombs would be employed rather than the 1000 pound G.P. which had been used so effectively on previous missions against installations in the same area. The fusing of .1 second nose and .1 second tail delay was selected after consideration of three important factors: the resistant construction of the roofs on the preponderance of important buildings, the height of the vital structures, and the rapidity with which the enemy is undertaking the repair of buildings which have suffered superficial damage. It was desired to inflict serious damage and destruction on machinery, equipment, and military supplies housed in the vital components of the target.

(b) Although Operations Analysis Section considered that a 500 pound G.P. bomb fused .1 second nose and .1 second tail delay released at 20,000 feet or above by aircraft of this Command would penetrate any one of the large concrete roofed warehouses on the eastern side of the target area and detonate within the structure, it was pointed out that the detonation probably would be contained within the buildings. In such an event the damage inflicted would be greatly in excess of the visual damage identifiable on reconnaissance photographs, unless explosive or combustible materials were hit causing secondary explosions or fire which resulted in complete destruction.

(3) Bombing Data:

(a) Bombing on this mission was to be accomplished by 3 plane formations from the following prescribed altitudes: 21,000 feet for the 40th Group, 22,000 feet for the 444th Group, 23,000 feet for the

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462nd Group, and 20,000 feet for the 468th Group. The aiming point for the 40th and 444th Groups was designated as the southwest corner of a power house on the west side of the target area. The 462nd and 468th Groups were assigned the west edge of a long warehouse on the east side of the target area as an aiming point. The prescribed axis of attack was 109 degrees magnetic with breakaway to the left.

(b) The aiming point for the primary radar target was designated as the shoreline edge of Bukam Island. The prescribed axis of attack was 275 degrees magnetic.

(c) The aiming point for the secondary target was the stack of the main power house at the Malayan Collieries. For the last resort target, the aiming point was designated as the center of the main hutted areas northeast of the jetties at Khao Huagang.

4. EXECUTION OF THE MISSION (See Annexes A and K):

a. Take-off:

(1) Take-off times were not specified. Instead, Groups were directed to leave the assembly point by 0227Z.

(2) Take-offs were on D-day minus 1 as follows:\*

<u>Group</u>	<u>A/C Airborne</u>	<u>First A/C Off</u>	<u>Last A/C Off</u>
40th	12	1800	1817
444th	20	1755	1834
462nd	12	1800	1816
468th	<u>19-a</u>	<u>1830</u>	<u>1908</u>
Total	63	1755	1908

\* All times Zebra. a - plus 1 A/C which took off late at 1933.

(3) Weather at bases for take-off was clear with visibility 5 to 7 miles. Winds were from the southwest at 6 miles per hour except at Chakulia where a 10 mile north wind prevailed.

b. Route Out:

(1) The route to the target for all Groups was from base to assembly points to the initial point at Cape Segenting (01°48'N - 102°54'E) to the target. The assembly point for the 40th and 468th Groups was the south tip of Roepet Island (01°41'N - 101°39'E) and for the 444th and 462nd Groups, the north tip of Roepet Island (02°07'N - 101°39'E). The initial point for the primary radar target was a point on Bintan Island at 01°10'N - 104°20'E.

(2) Deviations from the briefed route were made by 25 aircraft, 15 on the route out. One aircraft bombed the primary radar target, 3 the secondary target, 1 the last resort target, 8 aircraft jettisoned bombs, and 2 returned to base with bombs.

c. Primary Target:

(1) Of the 64 aircraft airborne, 49 bombed the Naval Base visually dropping a total of 388 M-43 and M-64 general purpose bombs

- 4 -  
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(104.69 short tons). Aircraft were over the target from 0222Z to 0320Z at altitudes of from 19,200 to 24,000 feet. Bombing was accomplished by single aircraft and by formations of from 2 to 5 aircraft. Axes of attack varied from 74 degrees to 209 degrees magnetic and indicated air speeds from 183 to 200 miles per hour.

(2) One aircraft bombed the primary radar target dropping 8 M-64 general purpose bombs (2.18 short tons) at 0241Z from an altitude of 20,700 feet on a magnetic heading of 74 degrees at 195 miles per hour indicated air speed.

(3) Weather at the primary target was generally fair for bombing with 5/10 cirrostratus clouds in variable layers based at 21,000 feet and 2/10 cumulus topped at 5000 feet. Visibility was 5 miles.

d. Secondary Target:

(1) Three single aircraft bombed the secondary target, the first at 0225Z and the last at 0349Z. Bombing was from altitudes of from 12,000 to 23,000 feet on axes of attack varying from 05 degrees to 320 degrees magnetic and indicated air speeds varying from 167 to 195 miles per hour. A total of 23 M-64 general purpose bombs were dropped (6.25 short tons). One aircraft bombed visually, one by radar, and one on the Navigator's ETA because of inoperative radar equipment.

(2) Weather at the secondary target was generally 9 to 10 tenths undercast.

e. Last Resort Target: One aircraft bombed the last resort target visually through 8 tenths broken undercast at 0429Z, dropping 8 M-64 general purpose bombs from 15,000 feet. Bombing was accomplished on an axis of attack of 40 degrees magnetic at an air speed of 190 miles per hour indicated.

f. Route Back:

(1) Route back was direct from target to base.

(2) There were 10 deviations from the briefed return route. Eight aircraft landed at bases other than those of the XX Bomber Command. Two aircraft failed to return from the mission.

(3) Weather on return to base was clear with visibility from 7 to 9 miles. Winds were generally westerly from 5 to 15 miles per hour.

5. ENEMY ANTI-AIRCRAFT (See Annex B)

a. Moderate and accurate (81%) to inaccurate (19%) heavy anti-aircraft fire was encountered by 50 aircraft over the primary target area from 0220Z to 0321Z at altitudes varying from 19,500 to 26,000 feet true under CAVU to 3/10 undercast conditions. The majority of fire was continuously pointed with some barrage type.

b. Black bursts were reported by all crews with 19 crews reporting white bursts and 3 reporting phosphorous bursts. Crews in one formation reported red bursts from 0241Z to 0318Z. These bursts were described as "big, red, balls of fire" and as "an orange glow lasting approximately 1 second." These bursts were interspersed with black bursts.

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c. Identified on strike photographs and reported as providing the most effective opposition were 1 NACHI class heavy cruiser, 1 ATAGO class heavy cruiser, and 1 335 foot destroyer. The majority of damage and loss due to flak, if not all, is believed to have been the result of naval antiaircraft fire originating from these vessels. The accuracy of fire encountered again illustrates the effectiveness of the Japanese naval antiaircraft as compared to land based antiaircraft.

d. Although some formations followed each other closely over the target only 3 seems to have benefited from this saturation of the antiaircraft defenses which fired almost continuously from 0220Z to 0224Z, at 0233Z, from 0239Z to 0256Z, from 0304Z to 0308Z, and from 0310Z to 0321Z. During these periods formations passing out of range were quickly dropped and formations approaching on their bomb runs were engaged without apparent loss of time, indicating good fire discipline as well as dual fire control equipment.

e. Heavy antiaircraft fire commenced on an average of 2.4 minutes before the bomb release point was reached and stopped 0.7 minutes following release of bombs. The number of bursts observed at one instant varied from 4 to 8 with some reports of from 1 to 30. Overall totals of bursts for any encounter normally ran from 75 to 150.

f. Seventy per cent of the aircraft over the Naval Base were struck by heavy flak resulting in the loss of 2 aircraft, major damage to 7, and minor damage to 26. By a breakdown of the altitudes at which each aircraft bombed and was hit by flak, it is evident that the enemy fire was most accurate 22,000 and 23,000 feet true altitude.

g. The one aircraft bombing Bikum Island, primary radar target, encountered moderate and accurate to inaccurate black heavy antiaircraft fire at 0242Z (1 minute after bomb release at 20,700 feet true altitude through 2/10 undercast. The number of bursts observed at one instant varied from 4 to 6 resulting in a total of approximately 50 for the encounter. Predicted concentration type of fire was reported. No antiaircraft fire was encountered at either the secondary or last resort targets.

h. A fairly effective white smokescreen was started prior to the bombing of the 5th formation which was over the target at 0241Z. A maximum of 3 generators was in operation as determined from strike photographs. By 0245Z 2 of the generators had ceased operation. One generator remained in operation from 0248Z to 0306Z but had no effect upon the bombing results.

6. ENEMY AIR OPPOSITION (See Annex C):

a. Enemy air opposition was weak on this mission. One B-29 sustained minor damage and claims made against enemy aircraft were one probably destroyed and four damaged. The enemy made 32 single plane attacks and 9 coordinated attacks, a total of 56 individual encounters. Nineteen of the 51 B-29's attacking the primary targets were attacked.

b. All encounters occurred in the target area with 36 per cent coming before bombing, 14 per cent during bombing, and 50 per cent after bombing. Air action extended over a 58 minute period from 0222Z to 0324Z and took place at altitudes of from 19,000 to 24,500 feet.

c. The enemy force opposing the mission was estimated at 18 aircraft and consisted of first line operational planes.

- 6 -  
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By VAN NARA Date 12-8

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d. Japanese pilots showed a distinct preference for the high frontal approach and attacks were not aggressive. The enemy fired in 34 of the 56 encounters.

e. There were 16 aerial bombing encounters. Aiming was poor and no damage resulted from these attacks. Eight of the air to air bombing encounters also developed into firing attacks.

f. Six of the 9 coordinated attacks were made by two fighters each. Of the remaining 3, one was coordinated by 3 enemy planes, 1 by 4 planes and 1 by 5 planes. None of the coordinated attacks were aggressive or effective.

g. The attack resulting in damage to 1 B-29 was a high "12 o'clock express" encounter in which the fighter rolled over on its back and flew a vertical pursuit curve. The attack was well timed and closely pressed

h. There were no ramming or rocket attacks.

7. WEATHER (See Annex D):

a. The weather forecast for this mission was substantially correct except in the area from 6 degrees north to the target. The clouds encountered in this area from 10,000 to 20,000 feet were greater both in thickness of layers and total amount, than had been forecast.

b. Cloudiness encountered in the vicinity of the assembly point made assembly difficult in some cases.

c. For the most part route weather was suitable for formation flying and good for precision bombing.

d. Metro winds were generally rated as fair to good.

8. COMMUNICATIONS (See Annex E):

a. Communications were satisfactory on this mission. Ninety eight per cent of the aircraft were accounted for by bombs away messages and 96 per cent by position reports.

b. A large amount of distress traffic was handled successfully from three flak damaged aircraft and their escorts.

c. There were no violations of cryptographic security or XX Bomber Command Tactical Doctrines. Two radio operators exchanged operational information in the clear via Command channels thus violating security.

d. The only indication received of enemy interference was a false homing signal which blocked one 8 megacycle channel. The crew of an aircraft in distress clamped down the transmitter key prior to bailing out and the original was heard for 12 1/2 hours, long after the aircraft's gasoline supply would have been exhausted. Direction finding cuts established the station sending out the signal in the general vicinity of Rangoon.

e. Three requests for D/F facilities were made and air-to-air homing was used by one Group only. Five aircraft of this Group were able to rendezvous from a distance of 45 miles using air-to-air homing.

- 7 -  
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By VAN NARA Date 12-8

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(f) There were 6 malfunctions of airborne equipment, 3 of which were repaired in flight.

9. RADAR (See Annex F):

a. The majority of the bombing was visual on this mission with only 2 aircraft bombing by radar. Radar was of considerable aid over the assembly and initial points and also on the bombing run as cloud cover over these areas was heavy. An average of 3 sighting angles was given by radar operators on the bombing run before the target became visible to the bombardiers.

b. Radar scope photography was satisfactory and a number of usable photographs were returned.

c. Serviceability of the radar systems was again maintained at a high operational level.

10. RCM (See Annex G):

a. Four RCM search aircraft each equipped with bottom mount D/F antennas participated in this mission. The RCM Observers searched for early warning radar en route to and from the target and for radar fire control equipment while in the target area.

b. The first enemy early radar intercept was made in the south Andaman Island area at 012227. Radar sites in the Andaman Island, Penang Island, and Singapore Island areas were in operation and undoubtedly furnished the enemy adequate warning.

c. No intercepts were made with radar fire control characteristics.

d. A continuous C.W. signal on the 8 M.C. channel appeared to be an attempt by the enemy at radio countermeasures or deception.

e. There were no malfunctions of equipment.

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

a. The mission was considered satisfactory with respect to gunnery.

b. Enemy fighter opposition was weak although a total of 21,270 rounds of ammunition were expended in combat firing in addition, a total of 4925 rounds were expended in test firing.

c. There were 2 malfunctions reported for a total of 270 turrets, and 3 malfunctions among the 548 caliber .50 machine guns airborne.

12. CAMERAS AND PHOTOGRAPHS (See Annex I):

a. A total of 62 cameras were airborne on this mission. Based on incomplete reports, 55 cameras were in aircraft bombing targets. Of this total, 37 photographed targets resulting in 358 usable negatives.

b. There was only 1 mechanical malfunction among airborne cameras.

-- 8 --  
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13. AIRCRAFT LOSSES AND DAMAGE (See Annexes J and M):

a. Known Battle Losses and Battle Damage:

(1) Two aircraft were lost on this mission as a result of enemy antiaircraft fire. One of these aircraft was abandoned by its crew over the Straits of Malacca near Cape Segenting and the other was abandoned over Aerial Island. No aircraft were lost as a result of enemy fighter action.

(2) Seventy per cent of the aircraft over the primary target were damaged by enemy aircraft. Seven aircraft received major damage and 26 received minor damage. One aircraft was damaged by enemy fighter action.

b. Known Operational Losses and Damage: None.

c. Missing Aircraft: None.

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

a. Of the 64 aircraft airborne, 10 failed to bomb the primary target for mechanical reasons, most of which were power plant failures.

b. There were 51 malfunctions of equipment in flight as follows: power plant and accessory section - 9; propellers and governors - 9; oil system - 8 (4 oil lines); fuel system - 1 (fuel cell leak); electrical - 9 (3 bomb racks); instruments - 13 (5 cylinder head temperature gauges); and miscellaneous - 2 (1 radar).

c. Over-all averages for fuel consumption were as follows: for the 3850 mile flight: average - 7180 gallons; maximum - 7650 gallons; minimum - 6775 gallons. Statistics by Groups were as follows: 40th Group average - 7225 gallons (maximum - 7500 gallons, minimum - 6950 gallons); 444th Group average - 7215 (maximum - 7650 gallons minimum - 6950); 462nd Group average 7040 gallons (maximum - 7300 gallons, minimum - 6775 gallons); 468th Group average - 7175 gallons (maximum - 7500 gallons, minimum - 6950 gallons).

15. TARGET DAMAGE ASSESSMENT (See Annex L):

a. Previous attacks on the Naval Base Area had effected damage to buildings amounting to 436,200 square feet or 21.6 per cent of the total area of buildings. Damage from this attack amounted to 235,100 square feet or 11.6 per cent of the total area of 2,020,300 square feet of buildings. In this attack 216,400 square feet sustained structural damage and 18,700 square feet superficial damage. As a result of this attack, previous attacks, and repairs, there are now 623,600 square feet or 30.8 per cent of the building areas still damaged. Of this total of damage 24.3 per cent is structural and 6.5 per cent superficial damage.

b. The four large transit sheds and the three large storehouses all received direct hits, resulting in extensive destruction and damage to three of the transit and probable extensive interior damage to the fourth transit shed and three storehouses. Severe structural damage was sustained by the garage, pilot's house, sawmill, lumber store, riggor's shop, and miscellaneous small buildings and sheds. One near miss of 30 feet may have caused slight underwater damage to the 5,000 ton floating drydock. One large residential building south of number 3 storehouse was 50 per cent damaged.

- 9 -

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Authority NND 760063

By VAN NARA Date 12-8

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c. Repair activity is underway on a number of damaged installations. All repair activity is around the graving dock and among the buildings around the west wall area. No activity is visible around the Admiralty Floating Dock IX, the condition of which appears the same as reported in Damage Assessment Report number 41.

*R. M. Hamey*  
R. M. HAMEY,  
Brigadier General, U.S.A.,  
Deputy Commander.

- 10 -  
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C O N F I D E N T I A L

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 - TAKE-OFF INFORMATION

Mission No. 41

2 March 1945

Group	First A/C Off	Last A/C Off	Elapsed Time	No. of A/C Taking Off	Average Take-off Interval
40th	011800Z	011817Z	17 min.	12	93 sec.
444th	011755Z	011834Z	39 min.	20	123 sec.
462nd	011800Z	011816Z	16 min.	12	87 sec.
468th	011830Z	011908Z	38 min.	19-a	127 sec.
Over-all	011755Z	011903Z	73 min.	63	- - -

a. Plus A/C #227 which took off late at 011933Z

II - DETAILS OF ROUTES

Mission No. 41

2 March 1945

A. Planned Routes

Base	40th	468th	444th	462nd
	Chakulia	Kharagpur	Dudhkundi	Piardoba
Assembly Point	south tip of Roepat Is. (01°41'N - 101°35'E)		north tip of Roepat Is. (02°07'N - 101°39'E)	
Initial Point	visual - Cape Segenting (01°48'N - 102°54'E) rader - Point on Bintan Island (01°10'N - 104°20'E)			
Target	visual - Warehouses and Shops - Singapore Naval Base Area rader - Bukum Island Refinery			
Base	Chakulia	Kharagpur	Dudhkundi	Piardoba

B. Deviations from Planned Routes

1. A/C Bombing Assigned Targets:

	40th	444th	462nd	468th	Total
Secondary Target	0	2	0	1	3
Last Resort Target	1	0	0	0	1
Total	1	2	0	1	4

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a. A/C 897 (444th) flew briefed route to the assembly point, turned on a heading of  $360^{\circ}$ , and flew direct to the secondary target. After releasing its bombs, the aircraft returned directly to base.

b. A/C 273 (444th) flew briefed route to the primary target. This aircraft arrived at the primary target in formation but lost the formation in the clouds and flew direct to the secondary target, on a magnetic heading of  $320^{\circ}$ . After releasing bombs this aircraft returned direct to base.

c. A/C 460 (468th) flew briefed route to the assembly point, then direct to the secondary target, back to the assembly point, direct to the initial point, and finally back to the secondary target where bombs were released. After releasing bombs, the aircraft returned direct to base. These deviations were made because of inoperative radar and bad weather. Pilot was attempting to find a visual target.

d. A/C 420 (40th) flew on briefed course to a point opposite the secondary target. At this point it turned and flew directly to the secondary target. Finding a complete undercast at the secondary, the aircraft proceeded to the target of last resort, released its bombs, and returned direct to base.

2. A/C Jettisoning Bombs:

a. A/C 337 (444th) jettisoned bombs shortly after take-off and returned direct to base landing at 020031Z.

b. A/C 446 (444th) jettisoned bombs shortly after take-off and returned directly to base, landing at 020043Z.

c. A/C 502 (462nd) flew to  $03^{\circ}45'N - 100^{\circ}25'E$ , jettisoned bombs at 020215Z, and returned direct to base, landing at 020925Z.

d. A/C 474 (462nd) flew to  $03^{\circ}55'N - 100^{\circ}45'E$ , jettisoned bombs at 0225Z, and returned direct to base, landing at 020930Z.

e. A/C 728 (462nd) flew to  $19^{\circ}25'N - 89^{\circ}45'E$ , jettisoned bombs, and returned direct to base, landing at 012150Z.

f. A/C 919 (462nd) flew to  $21^{\circ}30'N - 88^{\circ}00'E$ , jettisoned bombs, and returned to base, landing at 011941Z.

g. A/C 464 (468th) flew to  $12^{\circ}32'N - 94^{\circ}00'E$ , jettisoned bombs at 012215Z and returned direct to base, landing at 020254Z.

h. A/C 468 (468th) was hit by heavy flak on the bomb run as a result of which bombs could not be released. They were later toggled off by means of a screwdriver and jettisoned in the sea.

3. A/C Returning with Bombs:

a. A/C 227 (468th) returned to base at 020435 after flying briefed course to  $11^{\circ}00'N - 95^{\circ}20'E$ .

b. A/C 734 (468th) returned to base at 012158 after flying briefed course out and back for approximately 2 hours.

A-II-2  
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4. A/C Landing at other than Home Base:

a. Akyab:

- (1) A/C 555 (40th) had one engine out and was low on fuel, landed at 1320Z and returned to base at 051348Z.
- (2) A/C 473 (462nd) landed at 1000Z for fuel, took-off and landed at base at 1250Z.
- (3) A/C 424 (468th) landed at 1126Z for fuel, took-off and landed at base at 1620Z.

b. Cox's Bazaar:

- (1) A/C 718 (40th) ran low on fuel because of flying escort for an aircraft in distress, landed at 1207Z, and returned to base the next day.
- (2) A/C 534 (444th) landed for fuel at 1106Z, took-off at 1332Z, and landed at base at 1513Z.
- (3) A/C 327 (444th) landed for fuel at 1106Z, took-off at 2008Z and returned to base at 2151Z.
- (4) A/C 457 (462nd) landed for fuel at 1045Z and returned to base at 1412Z.
- (5) A/C 534 (462nd) landed at 0935Z because of a fuel leak and returned to base at 040947Z.

5. Other Deviations:

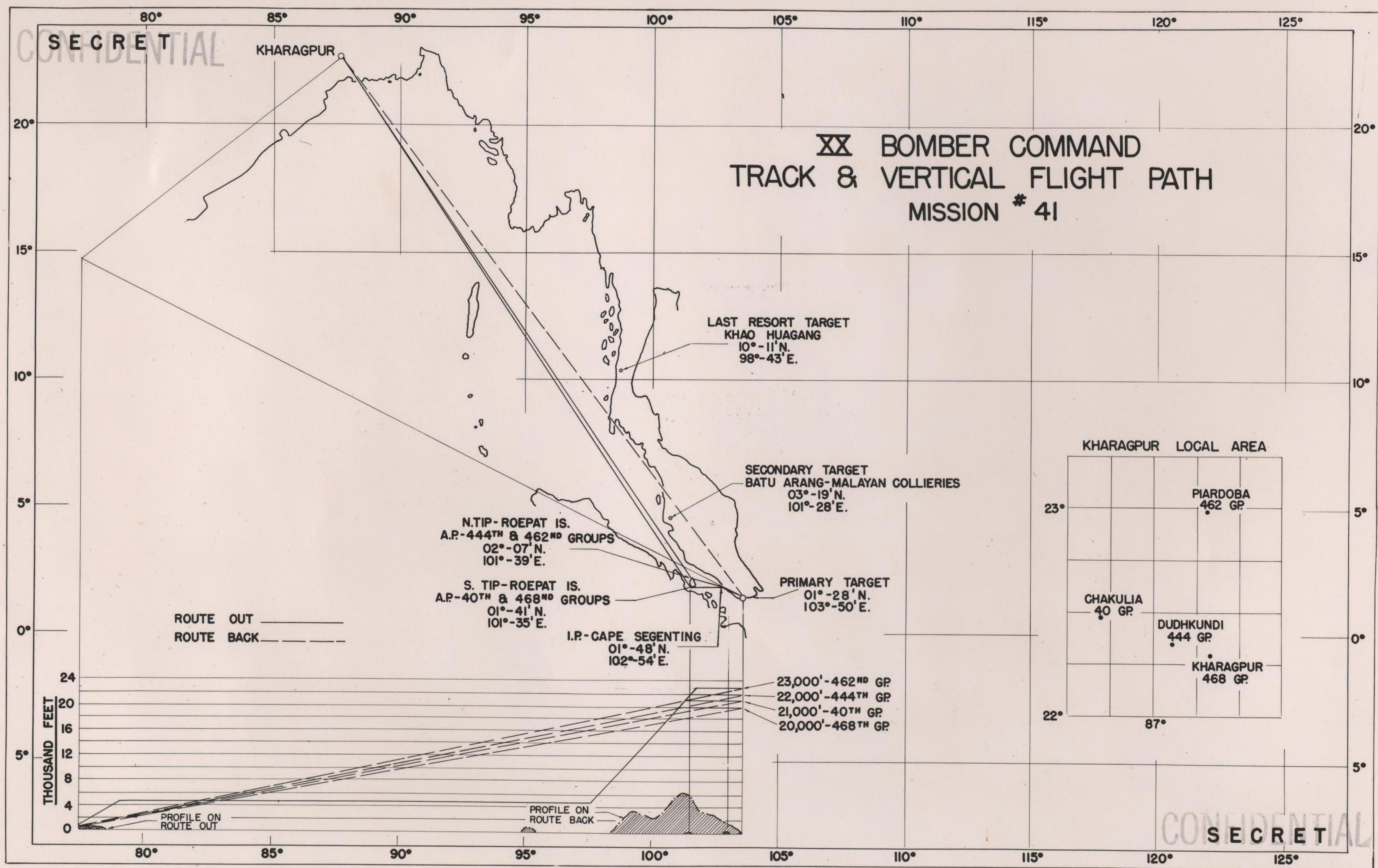
A/C 315 (468th) flew briefed route to initial point, turned and flew a heading of 120° magnetic to Great Karimoen Island, and made a run on the primary radar target on a heading of 70° magnetic. After dropping bombs, aircraft made breakaway to the right and flew direct to base.

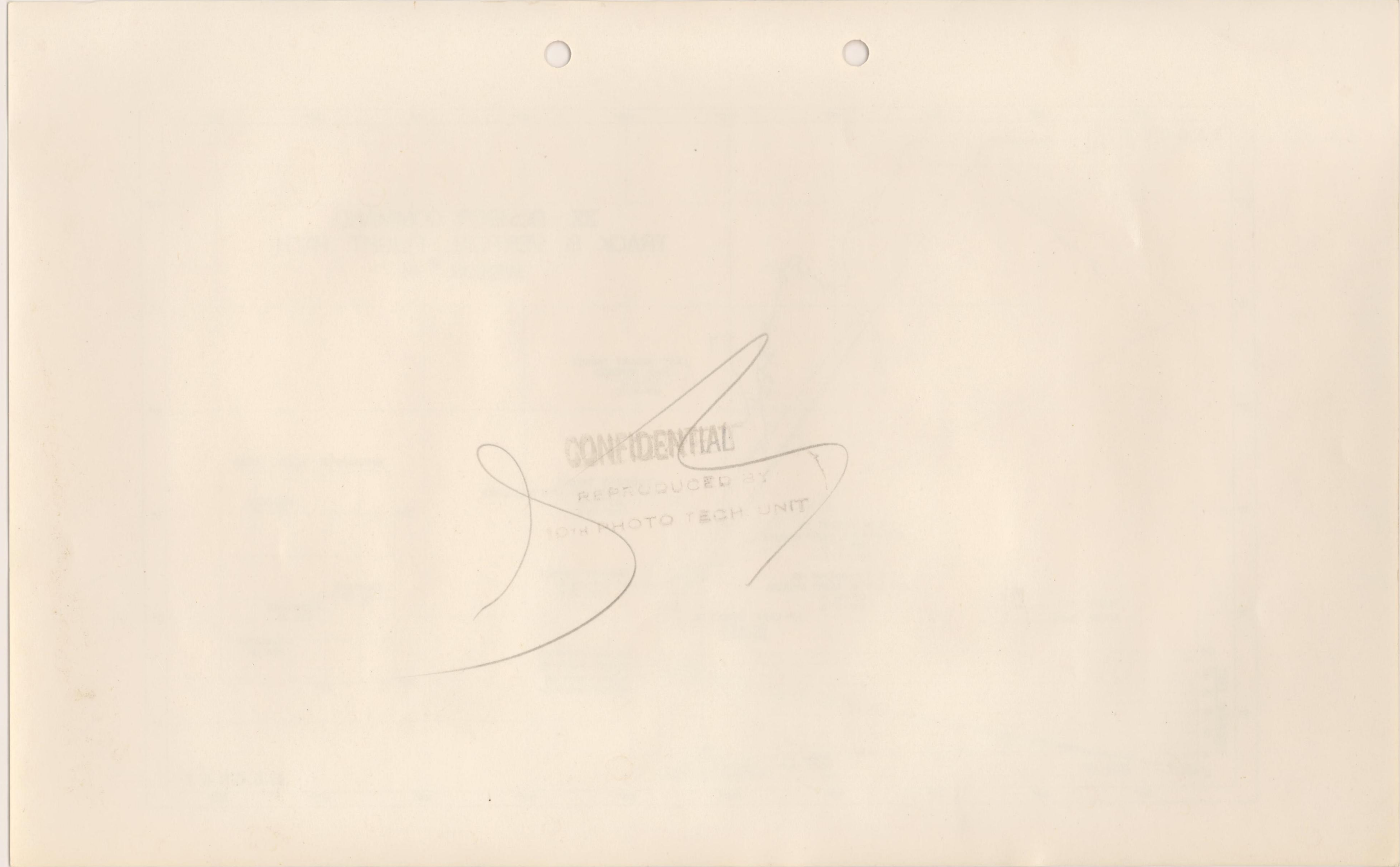
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HEADQUARTERS  
XX BOMBER COMMAND  
APO 493

CONSOLIDATED  
SPECIALIST MISSION REPORT  
OF STAFF BOMBING OFFICER

Date Prepared: 5 March 1945

Field Order Number 41  
Date of Mission: 2 Mar 45

1. Cloud coverage over the Primary Target (Singapore Naval Dock Area) was CAVU and all bombing was performed visually. A composite bomb plot analysis chart reveals that 50% of all bombs plotted fell in an area within 1000 feet of the assigned aiming points. The average aiming error was 1,200 feet (average deflection error - 300 feet "left"; average range error - 1,100 feet "over").

2. Difficulties encountered which prevented bombing as planned are:

a. Failure of many lead crew aircraft to assume lead positions in formations:

(1) Two lead crews aborted.

(2) Assembly was poorly effected due to "soup" at assembly altitude. Several lead crews made individual bomb run due to failure to assemble formation.

(3) Four lead crews were forced to relinquish lead to deputy due to ice formed on bombsight window.

b. One aircraft was forced to bomb the Primary Radar Target using radar sighting due to heavy ice on nose of aircraft which prevented visual sighting.

c. Intense and accurate AA fire encountered on bomb run in some cases actually disrupted sighting operations and in others was a psychological factor in preventing accurate bomb runs.

3. Bombs from aircraft #846 of the 40th were struck by a near-miss burst of flak shortly after release. Although considerably tumbled about, no bombs were observed to detonate. These bombs were equipped with the modified long -delay arming vanes which might have been the factor which prevented aerial detonation.

4. Reported malfunctions of bombing equipment:

40th Group

None

444th Group

#485 - three bombs jettisoned after attempted electrical release failed. Cause: unknown. Ground checked O. K.

462nd Group

#800 - four bombs on right rack, rear bay could not be released normally or by salvo and were jettisoned with a screw-driver. (all-electric release system). Cause: Lower release station inoperative and thus prevented release of upper stations.

468th Group

#445 - bombs failed to release electrically and were salvoed. Cause: Electrical short in the bombing circuit.

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V - BOMB LOADING DATA\*

Mission No. 41

2 March 1945

Bombs loaded per A/C	40th		444th		462nd		463th		Total		Weight per A/C - pounds	Weight per A/C - short tons
	A/C	M-64	A/C	M-64	A/C	M-64	A/C	M-64	A/C	M-64		
7			1	7	3	21	4	28	8	56	3607.10	1.90
8	12	96	13	152	4	32	16	128	51	408	4351.20	2.13
9					5	45			5	45	4095.19	2.45
Total	12	96	20	159	12	98	20	156	64	509	4325.70	2.16

\* Bombs loaded were M-64 (amatol) or M-43 (TNT) general purpose bombs weighing 543.9 pounds

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VI - DISPOSITION OF BOMBS

Mission No. 41

2 March 1945

	40th		444th		462nd		468th		Total		Pounds Dropped	Tons Dropped
	A/C	M-64	A/C	M-64	A/C	M-64	A/C	M-64	A/C	M-64		
A/C bombing all targets and bombs dropped	12	96	18	141	8	62	17	133	55	432	23494.8	117.48
A/C over PT and bomb load carried	11	88	17a	136	8	66	16	126	52	416	22632.4	113.11
A/C bombing PT and bombs dropped	11	88	16	125	8	62	15	118	50	393	213752.7	106.88
A/C bombing Radar PT and bombs dropped							1	8	1	8	4351.2	2.18
A/C bombing ST and bombs dropped			2	16			1	7	3	23	12509.7	6.25
A/C bombing LRT and bombs dropped	1	8							1	8	4351.2	2.18
A/C jettisoning bombs			2	18b	4	36c	1	7	7	61	33177.9	16.59
A/C returning bombs							2	16	2	15	8702.4	4.35
Total	12	96	20	159	12	98	20	156	64	509	276845.1	138.42

- a. A/C 273 was over PT but did not release bombs. Bombed ST.
- b. 3 bombs hung up on A/C 485 and were later jettisoned.
- c. 4 bombs hung up on A/C 800 and were later jettisoned.

A-VI-1  
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VII - FORMATIONS FLOWN

Mission No. 41

2 March 1945

A. Formations Planned

1. Bombing by 3-plane formations was ordered for this mission in order to avoid a large bomb pattern, thus minimizing the chances of damaging the nearby King George VI drydock. Lead crews were instructed to drop smoke grenades while circling the assembly point to facilitate the assembly of formations.

2. Bombing altitudes specified were 20,000 feet for the 468th Group, 21,000 feet for the 40th Group, 22,000 feet for the 444th Group, and 23,000 feet for the 432nd Group.

B. Formations over the Targets

Formations are shown as they were at the time of bomb release over the primary target. Individual statistics are those of the lead aircraft. Diagrams are intended to show relative positions only. "W" represents an aircraft of the 40th Group, "X" the 444th Group, "Y" the 462nd Group, and "Z" the 468th Group.

1. Formations over the Primary Target:

1st.

W 795

Aiming Point	- West side Naval Base Area	Altitude	- 21,000'I
No. of A/C	- 1	Axis of attack	- 112°M
No. releasing	- 1	IAS	- 195
Time of release	- 0223Z	Bomb load	- 8 M-64
Method	- visual	Bombs dropped	- 8 M-64

2nd.

W 740

W 752

Aiming Point	- West side Naval Base area	Altitude	- 24,000'I
No. of A/C	- 2	Axis of attack	- 115°M
No. releasing	- 2	IAS	- 185
Time of release	- 0226Z	Bomb load	- 16 M-64
Method	- visual	Bombs dropped	- 16 M-64

3rd.

W 462

Aiming Point	- West side Naval Base Area	Altitude	- 21,000'I
No. of A/C	- 1	Axis of attack	- 166°M
No. releasing	- 1	IAS	- 190
Time of release	- 0235Z	Bomb load	- 8 M-64
Method	- visual	Bombs dropped	- 8 M-64

A-VII-1  
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4th. W 541  
Z 703 W 718  
W 555

Aiming Point	- West side Naval Base Area	Altitude	- 21,000' I
No. of A/C	- 4	Axis of attack	- 109°
No. releasing	- 4	IAS	- 190
Time of release	- 0240Z	Bomb load	- 32 M-64
Method	- visual	Bombs dropped	- 32 M-64

5th. Z 315

Aiming Point	- Shoreline of Bukum Island	Altitude	- 20,700' T
No. of A/C	- 1	Axis of attack	- 74° M
No. releasing	- 1	IAS	- 195
Time of release	- 0241Z	Bomb load	- 8 M-64
Method	- radar	Bombs dropped	- 8 M-64

6th. W 846

Aiming Point	- West side Naval Base Area	Altitude	- 21,000' I
No. of A/C	- 1	Axis of attack	- 209° M
No. releasing	- 1	IAS	- 190
Time of release	- 0242Z	Bomb load	- 8 M-64
Method	- visual	Bombs dropped	- 8 M-64

7th. Y 801

Aiming Point	- East side Naval Base Area	Altitude	- 23,000' I
No. of A/C	- 1	Axis of attack	- 106° M
No. releasing	- 1	IAS	- 192
Time of release	- 0245Z	Bomb load	- 9 M-64
Method	- visual	Bombs dropped	- 9 M-64

8th. W 233

Z 879 W 542

Aiming Point	- West side Naval Base Area	Altitude	- 21,000' I
No. of A/C	- 3	Axis of attack	- 110°
No. releasing	- 3	IAS	- 189
Time of release	- 0248Z	Bomb load	- 24 M-64
Method	- visual	Bombs dropped	- 24 M-64

9th. X 472

X 861 X 731  
W 455

Aiming Point	- West side Naval Base Area	Altitude	- 19,200' I
No. of A/C	- 4	Axis of attack	- 109° M
No. releasing	- 4	IAS	- 183
Time of release	- 0249Z	Bomb load	- 32 M-64
Method	- visual	Bombs dropped	- 32 M-64

A-VII-2  
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10th.

Y 457

Y 800

Y - 786

Aiming Point	- East side Naval Base Area	Altitude	- 23,000' I
No. of A/C	- 3	Axis of attack	- 130° M
No. releasing	- 3	IAS	- 195
Time of release	- 0253Z	Bomb load	- 24 M-64
Method	- visual	Bombs dropped	- 20 M-64

11th.

Y 299

Y 540

Y 694

Y 473

Aiming Point	- East side Naval Base Area	Altitude	- 20,000' I
No. of A/C	- 4	Axis of attack	- 106° M
No. releasing	- 4	IAS	- 200
Time of release	- 0254Z	Bomb load	- 33 M-64
Method	- visual	Bombs dropped	- 33 M-64

12th.

Z 678

Z 534

Z 691

Z 424

Aiming Point	- East side Naval Base Area	Altitude	- 20,000' I
No. of A/C	- 4	Axis of attack	- 106° M
No. releasing	- 4	IAS	- 195
Time of release	- 0255Z	Bomb load	- 31 M-64
Method	- visual	Bombs dropped	- 31 M-64

13th.

X 891

X 538

X 485

X 464

X 584

Aiming Point	- West side Naval Base Area	Altitude	- 22,000' I
No. of A/C	- 5	Axis of attack	- 107° M
No. releasing	- 5	IAS	- 190
Time of release	- 0306Z	Bomb load	- 40 M-64
Method	- visual	Bombs dropped	- 37 M-64

14th.

Z 460

Aiming Point	- None
No. of A/C	- 1
No. releasing	- None
Time of release	- None
Method	- None

Altitude - 23,000' I  
Note: This A/C failed to release over this target, proceeded to the secondary, and released bombs. Over primary target at 031.

A-VII-3  
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15th.

X 732

X 327

X 462

X 557

X 451

Aiming Point	- West side Naval Base Area	Altitude	- 22,000'I
No. of A/C	- 5	Axis of attack	- 105°
No. releasing	- 5	IAS	- 190
Time of release	- 0313Z	Bomb load	- 40 M-64
Method	- visual	Bombs dropped	- 40 M-64

16th.

X 228

X 496

Aiming Point	- West side Naval Base Area	Altitude	- 22,000'I
No. of A/C	- 2	Axis of attack	- 90°M
No. releasing	- 2	IAS	- 195
Time of release	- 0315Z	Bomb load	- 16 M-64
Method	- visual	Bombs dropped	- 16 M-64

17th.

Z 892

Z 486

Aiming Point	- East side Naval Base Area	Altitude	- 21,000'T
No. of A/C	- 2	Axis of attack	- 115°
No. releasing	- 2	IAS	- 195
Time of release	- 0313Z	Bomb load	- 16 M-64
Method	- visual	Bombs dropped	- 16 M-64

18th.

Z 487

Z 279

Z 665

Z 445

Aiming Point	- East side Naval Base Area	Altitude	- 21,300'T
No. of A/C	- 4	Axis of attack	- 117°M
No. releasing	- 4	IAS	- 189
Time of release	- 0319Z	Bomb load	- 31 M-64
Method	- visual	Bombs dropped	- 31 M-64

19th.

Z 276

X 524

Z 893

Aiming Point	- East side Naval Base Area	Altitude	- 19,500'T
No. of A/C	- 3	Axis of attack	- 107°M
No. releasing	- 3	IAS	- 190
Time of release	- 0320Z	Bomb load	- 24 M-64
Method	- visual	Bombs dropped	- 24 M-64

A-VII-4  
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2. Aircraft over the Secondary Target:

<u>A/C</u>	<u>Time</u>	<u>Method</u>	<u>Altitude</u>	<u>Heading</u>	<u>IAS</u>	<u>Load</u>	<u>Dropped</u>
Y 897	0225Z	radar	19,000'I	05° M	167	8 M-64	8 M-64
Z 460	0311Z	on ETA	23,000'T	310° M	195	7 M-64	7 M-64
X 273	0349Z	visual	12,000'I	320° M	190	8 M-64	8 M-64

3. Aircraft over the Last Resort Target:

W 420	0429Z	visual	15,000'I	40° M	190	8 M-64	8 M-64
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A-VII-5  
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HEADQUARTERS  
XX BOMBER COMMAND  
APO 493

CONSOLIDATED  
SPECIALIST MISSION REPORT  
OF STAFF NAVIGATION OFFICER

Date Prepared: 4 March 1945

Field Order No. 41  
Date of Mission: 2 Mar 45

1. Navigation on the strike against the Singapore Naval Base was quite successful but was complicated by bad cloud conditions over the assembly point, which however, apparently did not deter the navigators from bringing planes to the I.P. and target successfully. Increasing concern is being felt about the discrepancies between intended target time, with allowable variations, and the actual target time. It is realized that the controlled ground speed problem for B-29s on maximum range flights is impracticable, and possibly if we were not operating at maximum range, the navigators could more nearly work toward a coordinated attack. The following table is furnished on this mission to illustrate the above:

	<u>40th Group</u>	<u>444th Group</u>	<u>462nd Group</u>	<u>468th Group</u>
Estimated Take off Time:	1827Z	1839Z	1831Z	1832Z
Take off Time:	1800Z	1755Z	1800Z	1832Z
Estimated Target Time:	0300Z	0300Z	0300Z	0300Z
Target Time:	0222Z	0249Z	0245Z	0248Z
Estimated Arrive Base:	1127Z	1124Z	1134Z	1126Z
Arrive Base:	1120Z	1102Z	1049Z	1040Z
Distance to Target (SM):	1907	1863	1890	1875
Distance to Base (SM):	1853	1831	1856	1818

Estimated times are "no-wind" times and at best are only approximate. It is possible that the forecast winds have not been good thereby making a flight plan appear bad.

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

	<u>Nav Time Out</u>	<u>Nav Time Back</u>
40th Group	8h 28m	8h 46m
444th Group	8h 49m	8h 44m
462nd Group	8h 42m	8h 09m
468th Group	8h 19m	7h 55m

b. The following navigational aid work was reported:

	<u>Col LOP'S</u>	<u>Del Fixes</u>	<u>Radio Fixes</u>	<u>ODM's</u>
40th Group (12 Planes)	38	34	2	0
444th Group (20 Planes)	88	36	0	0
462nd Group (12 Planes)	25	19	7	1
468th Group (20 Planes)	84	50	0	0

- 1 -

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c. Forecast winds were fair. Actual winds reported were as follows:

	<u>One Half Way Out</u>	<u>Target</u>	<u>One Half Way Back</u>
40th Group	6,200' 215° 18K	21,300' 132° 22K	11,600' 187° 16K
444th Group	5,000' 260° 14K	22,000' 133° 26K	12,000' 68° 11K
462nd Group	3,000' 240° 11K	23,000' 125° 20K	14,000' 130° 15K
468th Group	6,000' 300° 15K	20,000' 115° 20K	13,000' 340° 18K

d. Radar operators cooperated extensively on this mission, and it is indicated that individual navigators need more training in scope interpretation.

2. It has now become tactically necessary to route planes almost directly back to bases. 40th Group states that navigators object to this direct route due to close proximity to enemy airdromes.

3. 462nd Group suggested that a "no wind" time be furnished to leave the assembly point. This was furnished to the Groups in the radio field order.

4. It is felt that the navigators of this Command are doing a commendable job. This is particularly applicable to recently assigned personnel.



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

A N N E X

B

E M E L Y A N T I A I R C R A F T

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* * * * *
*   Prepared by:   *
*                 *
*   Flak Officer   *
*                 *
*   XX Bomber Command *
* * * * *
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C O N F I D E N T I A L

HEADQUARTERS  
XX BOMBER COMMAND  
Intelligence Section  
ATC 493

13 March 1945

PRELIMINARY REPORT

ANTI-AIRCRAFT OPPOSITION

MISSION NUMBER 41, (DAYLIGHT), 2 MARCH 1945

Primary Targets - SINGAPORE NAVAL BASE, JOHORE STRAITS (visual) and BAKUM ISLAND, SINGAPORE Area (Radar), Secondary Target - MALAYAN Collieries, BATU ARANG, and Target of Last Resort - KHAO HUAGANG, THAILAND.

A. ANTI-AIRCRAFT FIRE ENCOUNTERED

1. NAVAL BASE AREA, JOHORE STRAITS, SINGAPORE (01°18'N - 103°51'E)

Moderate and accurate (81%) to inaccurate (19%) heavy anti-aircraft fire was encountered by all aircraft (50) over the area from 0220Z to 0321Z at altitudes varying from 19,500 to 26,000 feet true under CAVU to 3/10 undercast conditions. The majority of the fire was continuously pointed with some barrage type. The following table shows aircraft over the area in relation to time and heavy AA fire encountered:

Table I: Formations vs. Heavy Flak Encountered

Formation	Number of A/C	Bomb Release Time	Time Encountered	Heavy Flak Fire Encountered	True Altitude in feet	Undercast	Total Bursts	Heading
1	1	0222Z	0220-23Z	Moderate - Accurate	22,000	2/10	100	112°M
2	2	0226:30Z	0223-24Z	Moderate-Inaccurate	26,000	2/10	150	115°M
3	1	0235Z	0233Z	Meager - Accurate	22,000	CAVU	18	166°M
4	4	0240Z	0239-41	Moderate - Accurate	22,000	CAVU	100	109°M
5	1	0241:30Z	0240-43Z	Intense - Accurate	22,100	CAVU	100	209°M
6	1	0245Z	0244-46Z	Intense - Accurate	24,400	CAVU	300	106°M
7	3	0248Z	0245-48Z	Intense - Accurate	22,100	CAVU	100	110°M
8	4	0249Z	0248-50Z	Moderate - Accurate	20,100	CAVU	150	109°M
9	3	0253Z	0250-55Z	Moderate-Inaccurate	24,600	CAVU	150	130°M
10	4	0254Z	0251-56Z	Moderate - Accurate	21,250	CAVU	150	106°M
11	5	0255Z	0252-54Z	Moderate - Accurate	21,200	CAVU	50	106°M
12	5	0306Z	0304-07Z	Intense - Accurate	23,300	3/10	100	107°M
13	5	0313Z	0310-15Z	Moderate - Accurate	23,200	3/10	100	105°M
14	2	0315Z	0314-18Z	Moderate - Accurate	23,100	CAVU	100	90°M
15	2	0318Z	0317Z	Moderate-Inaccurate	21,000	CAVU	100	115°M
16	4	0319Z	0315-20Z	Intense - Accurate	21,300	CAVU	100	117°M
17	3	0320Z	0315-21Z	Moderate-Inaccurate	19,500	CAVU	40	107°M

Following are reports of intensity, accuracy and deviations. The percentages have been determined from the total number of affirmative reports in any one group, as above, level, or below:

B-I-1  
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Table II: Intensity, Accuracy and Deviations

<u>Reports of Accuracy</u>		<u>Reports of Intensity</u>	
Struck . . . . .	35 (59 percent)	Intense . . . . .	23 (43 percent)
Rocked . . . . .	2 ( 3 percent)	Moderate . . . . .	24 (44 percent)
Within 150' . . . .	11 (19 percent)	Meager . . . . .	7 (13 percent)
Outside 150' . . . .	11 (19 percent)		

<u>Reports of Deviations</u>				
Above 17 (20 percent)	Ahead . . . . .	30 (37 percent)	Left . . . . .	27 (30 percent)
Level 43 (49 percent)	Abreast . . . . .	31 (38 percent)	In Line . . . . .	38 (43 percent)
Below 26 (31 percent)	Behind . . . . .	21 (25 percent)	Right . . . . .	24 (27 percent)

Black bursts were observed by all crews while 19 reported white and 3 observed phosphorous flak. Also, starting at 0244Z (Formation #6) crews reported approximately 10 red bursts for each encounter up to 0318Z (Formation #14). These bursts were described as "big, red balls of fire", "like a match striking", and an "orange glow lasting approximately 1 second". It was also reported that following the red glow a "black-brown burst approximately 8' in diameter appeared", with one crew member stating that he "had observed the same type of red burst from naval craft at SAGOON, F.I.C." It was also observed that the phosphorous bursts were in groups of 4.

Again large and "very bright bursts" were seen (interspersed among the usual black bursts) similar to the Smokeless and Fragmentless Bursts reported in #33, Section "C", page B-I-8, as observed over the NAVAL BASE Area, SINGAPORE on 1 February 1945. The flight engineer of A/C 801 (462nd Group - Formation #6) observed such a burst from 10 to 30 feet ahead of the #4 engine "so bright that he thought the engine had burst into flame", the concussion from this burst being felt. In this case, however, fragment damage was found following ground examination. Observation of other "bright bursts" established traces of white smoke following the flash.

Continuously pointed fire is believed to have been delivered against all formations supplemented by possible barrage fire. Reports of barrage fire, may have been caused by observations of large groups of bursts (100 to 150) fired under continuous pointed conditions. Crews of Formation #2 were quite definite, however, stating that "they encountered a few bursts of continuous pointed fire about 3 1/2 minutes before bomb release (believed fire from Naval 8" guns). Fire ceased and then suddenly a barrage of bursts soon covered an air volume 5,000 feet in depth and 1,000 feet in width from approximately 20,000 to 25,000 feet in altitude. This barrage was seen ahead and directly on the axis of attack (115 M). When arriving over the spot, however, the smoke was dissipating rapidly and the fire had stopped." It is not believed that this barrage was directed against Formation #1 (1 aircraft). Barrage fire was also reported for several other formations, but it is not believed possible that the high percentage of damage could have resulted from this type of fire.

Identified on strike photos and reported as providing the effective opposition were 1 NACHI class CA at 1098-0178 (Flak Map SINGAPORE, Sheet E10402-N0110), 1 ATAGO class CA at 1097-0178, and 1 - 335 foot DD at 1103-0178. The majority of damage and loss, if not all, is believed to have been the result of naval fire originating from these vessels. The accuracy of fire encountered again illustrates the effectiveness of the Japanese navy as compared to land-based flak.

B-I-2  
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Although some formations followed each other quite closely, Formations #9, #15, and #17 only, appear to have benefited from this saturation of the defenses, which fired almost continuously from 0220Z to 0224Z, at 0233Z, from 0239Z to 0253Z, from 0304Z to 0305Z, and from 0310Z to 0321Z. During these periods formations passing out of range were quickly "dropped" and those aircraft approaching on their runs engaged without apparent loss of time, indicating good fire discipline and dual fire control equipment.

Heavy AA fire commenced on an average of 2.4 minutes before the bomb release time and stopped 0.7 minutes following release. Maximum times for initial fire varied from 3 to 5 minutes before bombs away. These times coupled with reports of large red bursts and the identification (through strike photos) of main batteries pointing in the direction of approach would indicate employment of the 8" guns on the CA's NACHI and ATAGO against our aircraft while beyond the maximum range of the standard AA weapons, land-based or ship-borne. This employment of large caliber surface guns was reported by the Navy for the Second Battle of the Philippine Seas where aircraft were engaged while from 10 to 15 miles from the enemy's vessels (Flak Information Bulletin Number 5 (Confidential), OPNAV-16V.#8483, December 1944). Accuracy of this fire encountered while on the bomb run appears to have been fairly good, some aircraft were rocked, with approximately 10 bursts observed for each of these encounters. No damage is believed to have resulted from this fire, however.

Generally no enemy aircraft were reported on the same course and altitude, although for Formation #7 one E/A was observed 3 minutes before bomb release. Formation #11 observed one E/A at PISANG Island (01°28'N - 103°15'E), and Formation #14 reported one Zeke 5 miles out and level.

The number of bursts observed at one instant generally varied from 4 to 8 with some reports of from 1 to 30. Overall totals of bursts for any encounter normally ran from 75 to 150 although a few reports mentioned a minimum of 12 to 40 and a maximum of 300.

There was no possibility of radar controlled fire through R.C.M. intercepts or undercast conditions.

2. BAKUM ISLAND, SINGAPORE TOWN AREA (01°14'N - 103°46'E)

One aircraft bombing the island encountered moderate and accurate to inaccurate black heavy antiaircraft fire at 0242Z (1 minute following bomb release) at 20,700 feet true altitude through 2/10 undercast. The number of bursts observed at one instant varied from 4 to 6 resulting in a total of approximately 50 for the encounter. Deviations were above, level, and below, ahead, and to the left and in line with the aircraft. Predicted Concentration type of fire was reported and no enemy aircraft were on the same course and altitude.

3. MALAYAN COLLEPIES, BATU ARANG (03°17'N - 101°30'E)

Three aircraft bombed this area from 0225Z to 0349Z from 12,000, 20,000 and 23,000 feet true altitude through 8/10 to 10/10 undercast but no antiaircraft opposition was encountered.

4. KHAO HUGANG, MAIN HUTTED AREA (10°11'N - 98°43'E)

One aircraft bombed this area from 16,050 feet true at 0429Z through 8/10 to 10/10 undercast but no antiaircraft opposition was encountered.

B-I-3  
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B. GROUND-TO-AIR ROCKETS, BARRAGE AND HIGH-ALTITUDE BALLOONS

None reported.

C. SMOKESCREENS

A fairly effective white smokescreen was started prior to the bombing of Formation #5 as determined from crew observations. Following 0245Z, however, the 2 generators identified in the NAVAL BASE Area had ceased operation. Concealment was poor at 0248Z and nil for the following formations. One generator at 1097-0177 (Flak Map, Singapore) was in operation from 0248Z to 0306Z, but had no effect on the bombing results. A maximum of 3 generators was in operation, as determined from strike photos.

D. DAMAGE FROM HEAVY ANTI-AIRCRAFT FIRE

Seventy percent of the aircraft over the NAVAL BASE, JOHORE STRAITS, SINGAPORE, were struck by heavy flak resulting in the loss of 2, major damage to 7, and minor damage to 26 aircraft, as follows:

Table III: Damage and Loss from Heavy Antiaircraft Fire:

Formation	Aircraft	Group	True Altitude	Heading	Classification
1	795	40th	22,000'	112°M	Minor
4	541	40th	22,000'	109°M	Minor
4	718	40th	22,000'	109°M	Major
4	555	40th	22,000'	109°M	Major
4	703	468th	22,000'	109°M	Minor
5	846	40th	22,120'	209°M	Minor
6	801	462nd	24,400'	106°M	Minor
7	233	40th	22,100'	110°M	Major
7	542	40th	22,100'	110°M	Minor
7	279	468th	22,100'	110°M	Minor
8	472	444th	20,100'	109°M	Minor
8	731	444th	20,100'	110°M	Minor
8	861	444th	20,000'	112°M	Minor
8	455	40th	20,100'	109°M	Minor
10	299	462nd	21,250'	106°M	Minor
10	694	462nd	20,850'	112°M	Minor
10	540	462nd	21,050'	116°M	Minor
11	678	468th	21,200'	106°M	Lost
11	469	468th	21,200'	106°M	Lost
11	534	468th	21,200'	106°M	Major
11	691	468th	21,200'	106°M	Minor
12	891	444th	23,300'	107°M	Major
12	485	444th	23,300'	110°M	Minor
12	538	444th	23,300'	107°M	Minor
12	464	444th	23,300'	106°M	Minor
12	584	444th	22,800'	106°M	Minor
13	732	444th	23,200'	105°M	Major
13	462	444th	23,200'	110°M	Minor
13	327	444th	23,500'	106°M	Minor
13	557	444th	23,000'	106°M	Minor
13	451	444th	23,000'	105°M	Minor

B-I-4  
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<u>Formation</u>	<u>Aircraft</u>	<u>Group</u>	<u>True Altitude</u>	<u>Heading</u>	<u>Classification</u>
14	228	444th	23,100'	90°M	Minor
16	279	468th	21,300'	117°M	Minor
16	665	468th	21,300'	117°M	Minor
16	445	468th	21,300'	117°M	Major

The altitudes at which aircraft bombed and were hit by flak can be broken down into general levels as shown in Table IV. From this breakdown it is evident that the enemy was most accurate at 22,000, 23,000 and possibly 24,000 feet true altitude (although only 1 aircraft bombed from 24,000 feet). This result is contrary to the known relation between the probability of damage or loss and altitude, but indicates that the Jap, for some unknown reason, concentrated on aircraft at these levels.

Table IV: Damage in Relation to Altitude

<u>True Altitude in Feet</u>	<u>Total Aircraft Bombing From This Altitude</u>	<u>Aircraft Hit by Heavy Flak</u>			
		<u>Loss</u>	<u>Major</u>	<u>Minor</u>	<u>Total</u>
20,000	7	0 (0%)	0 (0%)	4 (57.1%)	4 (57.1%)
21,000	16	2 (12.5%)	2 (12.5%)	7 (43.8%)	11 (68.8%)
22,000	9	0 (0%)	3 (33.3%)	5 (55.6%)	8 (88.9%)
23,000	12	0 (0%)	2 (16.7%)	9 (75.0%)	11 (91.7%)
24,000	1	0 (0%)	0 (0%)	1 (100%)	1 (100%)
25,000	3	0 (0%)	0 (0%)	0 (0%)	0 (0%)
26,000	2	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Totals	50	2 (4.0%)	7 (14.0%)	26 (52.0%)	35 (70.0%)

E. WARNING NETS

As aircraft were tracked by the PENANG and SINGAPORE early warning radar installations (as determined by R.C.M. Observers) plus 20 enemy fighter attacks between 0226Z and 0229Z and 5 sightings at 0222Z in the SINGAPORE Area, it is believed that the Jap had at least 30 minutes warning of the attack against the NAVAL BASE.

*Frank L. Scott, Jr.*

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Colonel, Air Corps,  
Chief, Intelligence Section.

B-I-5  
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ANNEX

C

ENEMY AIR OPPOSITION

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* * * * *  
* Prepared by: *  
* * * * *  
* Operational Intelligence Unit *  
* * * * *  
* XX Bomber Command *  
* * * * *
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I. JAPANESE FIGHTER TACTICS - MISSION NO. 41

TARGET: Singapore, Malaya.

TIME: Day Mission.

DATE: 2 March 1945.

1. GENERAL

a. As in the case of the three previous day missions against SINGAPORE, enemy air opposition was weak. Nineteen of the 51 B-29's bombing the primary target were attacked by fighters, but the only tangible effect of the Jap effort was a 20 mm hole through the wing of one B-29. The enemy waged 32 single plane attacks and nine coordinated attacks for a combined total of 56 individual encounters. All attacks occurred within the target area, with none on the routes to or from the target. The action extended over a 58 minute period from 0226Z to 0324Z and occurred at altitudes of 19,000 to 24,500.

b. RCM intercepts indicate that the mission was picked up by Jap radar in the PENANG area, yet no attacks occurred on the route to the target, and although the first bombs were dropped at 0222Z, the enemy did not attack until 0226Z. Overall, 20 encounters (36 per cent) occurred before bombing, eight (14 per cent) during bombing and 28 (50 per cent) after bombs had been dropped.

c. The Jap concentrated his force in the immediate area of the aiming point. Table No. 1 shows the time of bomb release for single B-29's and formations of B-29's which were attacked, together with the time of attacks. One formation was attacked 13 minutes after bombing, but the next largest time deviation was six minutes, with the average deviation about four minutes either before or after bombing.

Table No. 1 - Timing of Bomb Releases and Fighter Attacks

<u>B-29's Attacked</u>	<u>Time of Attacks</u>	<u>Time of Bomb Release</u>	<u>Time Deviation (min.)</u>
2 plane formation	0226-39Z	0226Z	13
single plane	0230-36Z	0235Z	5
4 plane formation	0240-41Z	0235Z	6
4 plane formation	0245-47Z	0249Z	4
3 plane formation	0245-49Z	0248Z	3
single plane	0246Z	0245Z	1
4 plane formation	0250-56Z	0254Z	4
4 plane formation	0255-56Z	0255Z	1
5 plane formation	0317Z	0313Z	4
2 plane formation	0317Z	0315Z	2
4 plane formation	0319-24Z	0319Z	5
3 plane formation	0319-24Z	0320Z	5
2 plane formation	0320Z	0318Z	2

C-I-1

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d. The Japanese force opposing the mission is estimated at 18 aircraft of the following types; 7 OSCARS, 3 TOJOS, 3 TONYs, 2 ZEKES, 1 FRANK, 1 ZEKE 32 and 1 JUDY (possibly a mis-identified TONY).

e. Preliminary claims of B-29 gunners are 0 enemy aircraft destroyed, 1 probably destroyed and 4 damaged.

## 2. DIRECTIONS AND LEVELS OF APPROACH

a. 55 per cent of the encounters approached against the front quarter, 18 per cent against the right beam, 9 per cent against the stern and 18 per cent against the left side. 70 per cent of the encounters against all quarters were high, 20 per cent level and 10 per cent low. Encounters against the front quarter, where most of the action took place were predominantly high with 58 per cent; level attacks against the front comprised 26 per cent and low attacks 16 per cent. The number of encounters is so small that it would probably be erroneous to attach much importance to these direction and level percentages, insofar as tactical trends and Jap preferences are concerned. Mission No. 41 shows a greater than normal concentration of attacks against the front quarter. Another divergence is that stern attacks against the B-29 are usually low; in both Missions No. 38 (also against SINGAPORE) and 41, a preference for a high stern approach was indicated. Details of directions and levels of approach are shown in Tables No. 2 and No. 3.

Table No. 2 - Directions and Levels of Approach

Direction of Encounter	Front			Right			Rear			Left			Total
	11	12	1	2	3	4	5	6	7	8	9	10	
High	7	7	4	1	4	4	0	2	1	1	4	4	39 (70%)
Level	2	3	3	0	0	0	0	2	0	0	1	0	11 (20%)
Low	2	1	2	0	1	0	0	0	0	0	0	0	6 (10%)
Total	11	11	9	1	5	4	0	4	1	1	5	4	56 (100%)
	31 (55%)			10 (18%)			5 (9%)			10 (18%)			

Table No. 3 - Levels of Approach by Quarters

Level of Approach	Front	Right	Rear	Left
High	18 (58%)	9 (90%)	3 (60%)	9 (90%)
Level	8 (26%)	0	2 (40%)	1 (10%)
Low	5 (16%)	1 (10%)	0	0
Total	31 (100%)	10 (100%)	5 (100%)	10 (100%)

C-I-2

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### 3. EXCHANGE OF FIRE

The enemy definitely fired in 34 of the encounters, possibly fired in an additional 11 encounters and definitely did not fire in the remaining 11 encounters. The distances at which the enemy opened fire for the 34 firing attacks are shown in Table No. 4. In 52 per cent of the attacks, fire was opened at 1000 yards or over. B-29's fired in 50, or 89 per cent, of the encounters, which is a normal percentage.

Table No. 4 - Distances Opened Fire

Distance (yards)	Enemy Fire		B-29 Fire	
	No. of Attacks	Percent	No. of Attacks	Percent
0 to 499	4	12	4	8
500 to 799	4	12	7	14
800 to 999	8	24	15	30
1000 & over	18	52	24	48
Total	34*	100%	50	100%

\* In an additional 11 encounters, it was not known if the enemy fired or not.

### 4. ENEMY AGGRESSIVENESS

Jap pilots were not aggressive. The majority of the attacks (45 per cent) were broken off between 250 and 500 yards. Only 26 per cent were pressed to less than 250, the majority of which were terminated at about 200 yards. The enemy was more aggressive in opposing Mission No. 41 than he was in opposing Mission No. 38 (the last previous attack on SINGAPORE) in that less of the encounters were broken off out around 800 to 1000 yards at the first sign of B-29 fire. He came closer, but was still reluctant to press his attacks in a determined manner. Distance data is shown in Table No. 5.

C-I-3

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Table No. 5 - Distances to which Attacks Were Pressed

<u>Distance (yards)</u>	<u>No. of Encounters</u>	<u>Percent</u>
1000 & over	1	2
800 to 999	2	4
500 to 799	13	23
250 to 499	25	45
0 to 249	<u>15</u>	<u>26</u>
Total	<u>56</u>	<u>100%</u>

5. AIR TO AIR BOMBING

a. The enemy made 11 single plane aerial bombing attacks and 3 coordinated aerial bombing attacks, for a total of 16 air to air bombing encounters (29 per cent of total encounters). As has been characteristic of past missions, this type of attack was ineffective, did not result in damage to any of the B-29's and had only nuisance value. Both phosphorous and fragmentation bombs were observed, with the former in the majority. 15 of the encounters originated from 11, 12 and 1 o'clock, with one coming in at 10 o'clock.

b. Bombs were released while the fighters were in level flight and by "flipping" or "slinging"; no dive bombing encounters were reported. In some cases, the fighters released bombs while flying in an overcast slightly above the B-29 formations. Aiming generally was very poor; one burst occurred 50 yards off the wing of a B-29, but in most cases the bombs exploded 200, 400 or more yards out. One B-29 had to fly through several phosphorous streamers, which it did without ill effects. A number of the bombs tumbled over and over in the air before exploding. In eight of the encounters, the fighters dropped bombs and then came on in to make normal firing attacks. Some enemy aircraft released as many as three bombs at a time.

c. Two fighters each were employed in the three coordinated aerial bombing attacks, and no new or unusual tactics were observed. In two of the attacks, both fighters dropped bombs. In the case of the third coordinated attack, an OSCAR approached high at 1 o'clock and dropped a bomb when about 500 yards out; immediately afterwards, a second OSCAR came in at 12 o'clock level, opened fire at 1000 yards, pressed the attack to about 400 yards and broke in a dive.

6. COORDINATED ATTACKS

a. Of the nine coordinated attacks met in this mission, three have been described in the preceding section. Three of the remaining six were executed by two fighters each, one was by three enemy aircraft, one by four aircraft and one by five aircraft. None of the coordinated attacks was closely pressed nor particularly well executed.

C-I-4  
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b. In the five plane attack, three fighters approached a single B-29 from 3 o'clock high, one from 7 o'clock high and one from 8 o'clock high; all five opened fire at long range and pressed the attack to about 300 yards, breaking away in sharp turns. It was a good attempt to split the B-29 fire, but did not result in damage to the bomber. One of the fighters approaching from 3 o'clock, an OSCAR, is claimed as damaged. The B-29 found cover in a cloud bank.

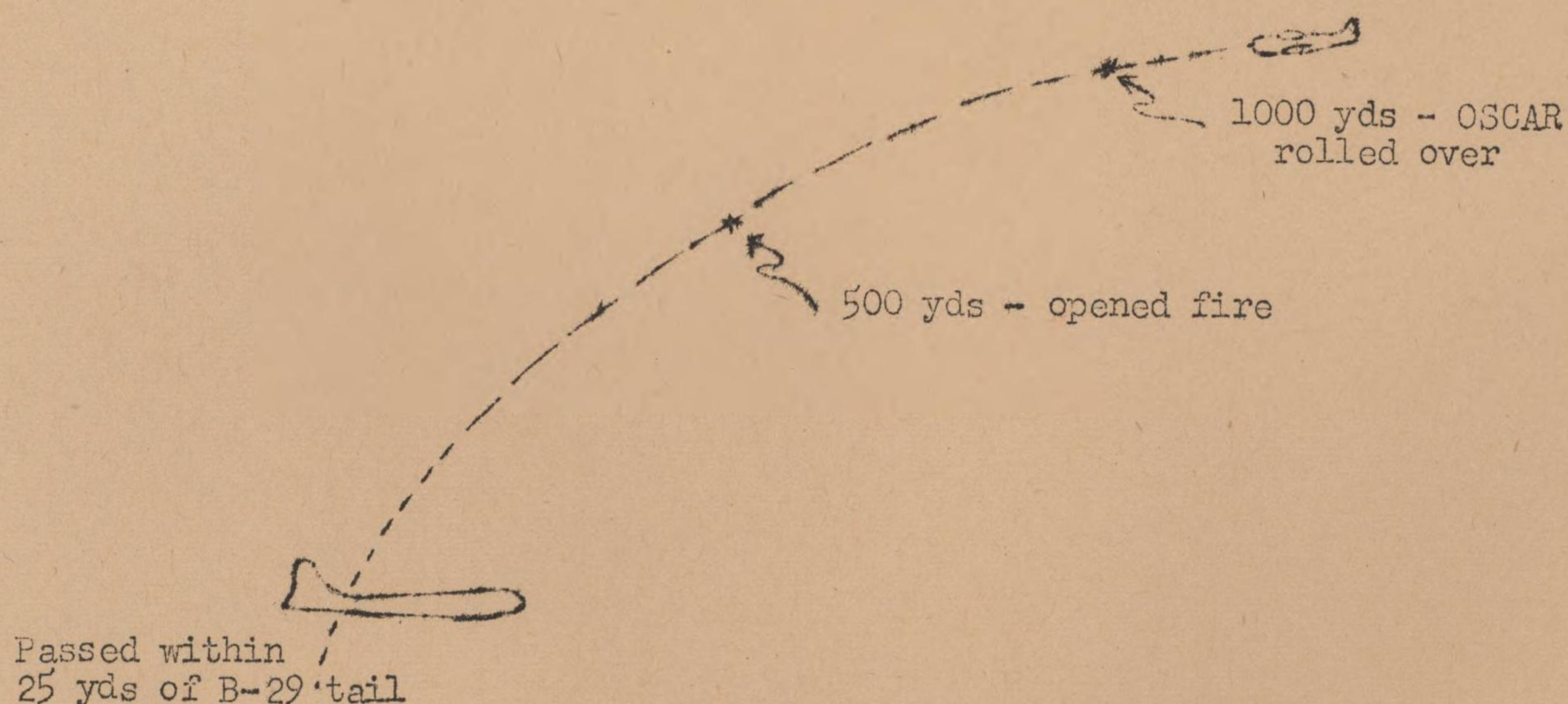
c. Four TONYS approached in trail at 4 o'clock high, opened fire at about 1200 yards and broke off the attack with steep dives when about 700 yards out.

d. Three TOJOS attacked in trail from 10 o'clock high, aiming at the rear plane of a four plane diamond formation. The attack was pressed only to 600 yards. One TOJO is claimed as damaged. It could not be determined whether the enemy opened fire or not.

e. The attacks coordinated by two enemy fighters were not unusual or noteworthy in any way.

7. ATTACK RESULTING IN DAMAGE TO A B-29

The Jap attack which inflicted damage on the one B-29 merits elaboration in that it was an unusual variation of the "12 o'clock Express" attack, and showed an exceptional degree of skill on the part of the enemy pilot. The plane was first sighted about two miles out, very high at 2 o'clock. As the fighter approached to about one mile, it wagged its wings and turned in towards the B-29 at 12 o'clock in a dive. When about 1000 yards above the bomber, the Jap rolled over on his back, came in on a vertical pursuit curve, opening fire at about 500 yards. A 20mm shell went through the root of the left wing. The dive was continued, passing within 25 yards of the B-29 tail. The timing of the attack was exceptionally good, and the pilot almost succeeded in raking the B-29 from nose to tail with 20 mm fire.



C-I-5

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8. ATTACKS AGAINST FORMATIONS

Formations of B-29's at the times they were attacked ranged from two to five aircraft. No preference was noted for attacks against particular formation positions. Attacks were about evenly distributed among lead, wing and rear planes.

9. POSSIBLE NEW ZEKE 52 ARMAMENT

One B-29 crew reported that a ZEKE 52 fired with 6 guns.

10. EVASIVE ACTION BY B-29'S

a. One B-29 lost 500 feet altitude and increased air speed immediately after bombs away.

b. Another B-29 sought cover in a nearby cloud formation after a coordinated attack by five Jap fighters.

11. RAMMING OR ROCKET ATTACKS: None.

12. CLAIMS AGAINST ENEMY AIRCRAFT

On a preliminary basis, B-29 gunners claimed one Jap aircraft probably destroyed and four damaged. Details are shown in Table No. 6.

Table No. 6 - 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 Brokeaway or Disintegrated (yards)
FRANK	Prob Dest	3	6 high	200	150
OSCAR	Damaged	2	1 level	800	100
OSCAR	Damaged	1	3 high	1200	300
TOJO	Damaged	4	10 high	1000	600
TONY	Damaged	1	12 low	1500	200

13. SUMMARY

a. Air opposition was weak. 19 out of 51 B-29's were attacked by an enemy force estimated at 18 fighters. One B-29 sustained minor damage; preliminary claims against enemy aircraft list one probably destroyed and four damaged.

b. There were 56 encounters, all in the target area. Attacks were concentrated near the bomb release point, during a 58 minute period, and at altitudes varying from 19,000 to 24,500 feet.

C-I-6  
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c. The Jap preferred the high frontal approach. Attacks generally were unaggressive.

d. There were 14 aerial bombing attacks, all ineffective, and nine coordinated attacks, none of which was closely pressed.

e. There were no ramming or rocket attacks, or new tactical developments.

14. MARKINGS OF ENEMY AIRCRAFT

<u>Color</u>	<u>Enemy Aircraft</u>	<u>Distinguishing Markings</u>
Olive-drab	OSCAR	Diagonal stripes on wings.
" "	OSCAR	Underside of wing blue.
" "	OSCAR	Yellow band around the red circles on the wing.
" "	OSCARS	No markings observed.
" "	TONY & TOJOS	No markings observed.
" "	ZEKE	Yellow stripes across the fuselage.
Camouflaged	TOJO	Orange band around fuselage behind cockpit.
" "	TONY	No markings observed.
Black	FRANK	Red suns.
Silver	OSCAR	No markings observed.
Dark Green	OSCAR	No markings observed.

C-I-7

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

ANNEX

D

WEATHER INFORMATION

- I - Weather Information
- II - Chart - Weather as Forecast and  
as Encountered
- III - Synoptic Map

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

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I - WEATHER INFORMATION

Mission No. 41

2 March 1945

	As Forecast	As Encountered
Base at Take-Off	Clear. Visibility 10 miles.	KHARAGPUR: Clear. Visibility 7 miles. Wind SW 6. PIARDOBA: Clear. Visibility 5 miles. Wind W 6. CHAKULIA: Clear. Visibility 7 miles. Wind N 10. DUDHKUNDI: Clear. Visibility 7 miles. Wind SW 6.
Route Out	BASE TO 16°N: Clear. Visibility 10 miles in haze. 16° TO 12°N: Scattered stratocumulus tops 4,000' increasing to 6,000' at 12°N. Scattered altostratus at 12,000' increasing to broken at 12°N. Scattered cirrostratus at 30,000'. 12° TO 06°N: 8/10 cirrus at 30,000'. 3/10 bulging cumulus, base 2,000' with variable top between 4,000' and 8,000'. 06° TO 02°N: Weak frontal zone. Overcast cirrostratus at 30,000'. 6/10 altostratus-altocumulus at 12,000'. Broken bulging cumulus tops generally 10,000' with few towering cumulus to 20,000'. Moderate turbulence in cumulus below 10,000' and moderate to severe above 10,000'. Moderate clear icing in cumulus above 16,000'. 02°N TO TARGET: Broken cirrostratus at 30,000'. 3/10 altostratus at 12,000'. 3/10 bulging cumulus, base 2,000', tops 8,000'. Visibility 25 miles.	BASE TO 16°N: Clear to 18° becoming 2/10 cumulus, 18° to 16°. Visibility 10 miles in haze. 16° TO 12°N: 3/10 cumulus bases 2000', tops 5,000'. 2/10 cirrostratus at 30,000'. 12° TO 06°N: 8/10 cirrus at 25,000'. 3/10 bulging cumulus base 2000', average tops 8000' with occasional buildups to 15,000'. 06° TO 02°N: Frontal zone 9/10 cirrostratus at 25,000'. 10/10 altostratus-altocumulus in two layers first with base 11,000', top 16,000'; second layer base 13,000', top 21,000'. 5/10 bulging cumulus bases 2000' tops generally 10,000' with buildups to 21,000'. Moderate turbulence in cumulus clouds. Light to moderate rime icing in clouds above 17,000'. 02°N TO TARGET: 5/10 cirrostratus in variable layers lowest reported 21,000' highest 28,000', with general average 25,000' altocumulus-altostratus 10/10 base, top 20,000' at 02°N decreasing to nil in target area. 2/10 cumulus tops 5,000'.
Target Area	Broken cirrostratus at 30,000'. 3/10 altostratus at 12,000'. 3/10 bulging cumulus base 2000' tops 8000'. Visibility 25 miles. Pressure at Target: 29.80 inches. Mean temperature from 22,000', 7° C.	5/10 cirrostratus in variable layers lowest reported 21,000', highest 28,000'. 2/10 cumulus tops 5000'. Visibility 15 miles.
Return Route	Similar to route out. Less cumulus activity in the Malacca Straits and Andaman Sea, but more cumulus over the land areas of Malaya and Sumatra.	Essentially the same conditions as encountered on the route out.

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	As Forecast	As Encountered
Base on Return	Clear. Visibility 10 miles	KIRACPUR: 1/10 cumulus at 4000'. Visibility 9 miles. Wind W 5 mph. PARIOBA: Clear. Visibility 8 miles. Wind WSW 15 mph. CHAKUNIA: Clear. Visibility 7 miles. Wind W 15 mph. TULAKUNDI: Clear. Visibility 9 miles. Wind 10 mph.

A. Winds Aloft - Forecast

Altitude	Base to 18 Deg.	18° to 12 Deg.	12° to 6 Deg.	6° to Target
3,000'	270/10K	300/06K	100/08K	070/05K
5,000'	270/12K	290/08K	110/10K	050/10K
10,000'	300/25K	290/10K	150/15K	110/17K
15,000'	300/30K	280/25K	160/15K	120/18K
20,000'			160/20K	130/20K
22,000'				130/20K

B. Winds Aloft - Encountered

Altitude	Base to 18 Deg.	18° to 12 Deg.	12° to 6 Deg.	6° to Target
6,000'	250/12K	220/08K	211/10K	
11,500'		190/15K		
15,000'	270/25K	270/25K		
20,000'				180/20K
22,000'				130/24K

C. Temperatures

As Forecast

Altitude	Target
3,000'	20 Deg C
5,000'	17 Deg C
10,000'	10 Deg C
15,000'	1 Deg C
20,000'	-9 Deg C
22,000'	-13 Deg C

As Encountered

Altitude	15 Deg N	10 Deg N	4 Deg N	Target
5,000'	18 Deg C	18 Deg C		
7,000'	15 Deg C	15 Deg C		
15,000'		1 Deg C		
19,000'			-7 Deg C	
20,000'				-10 Deg C
21,000'				-9 Deg C
22,000'				-11 Deg C
23,000'				-14 Deg C

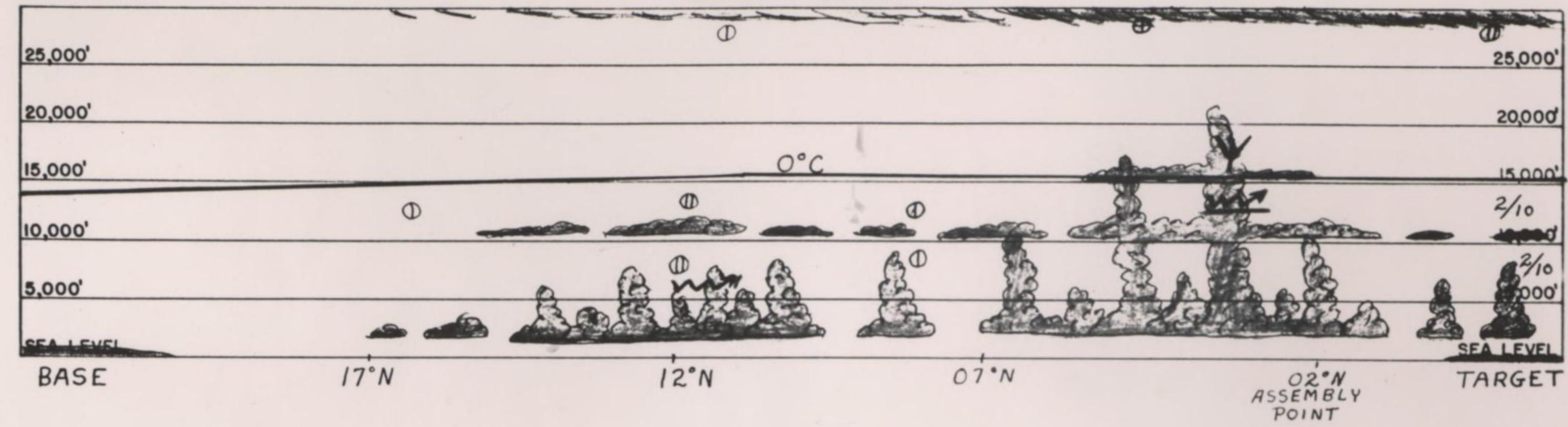
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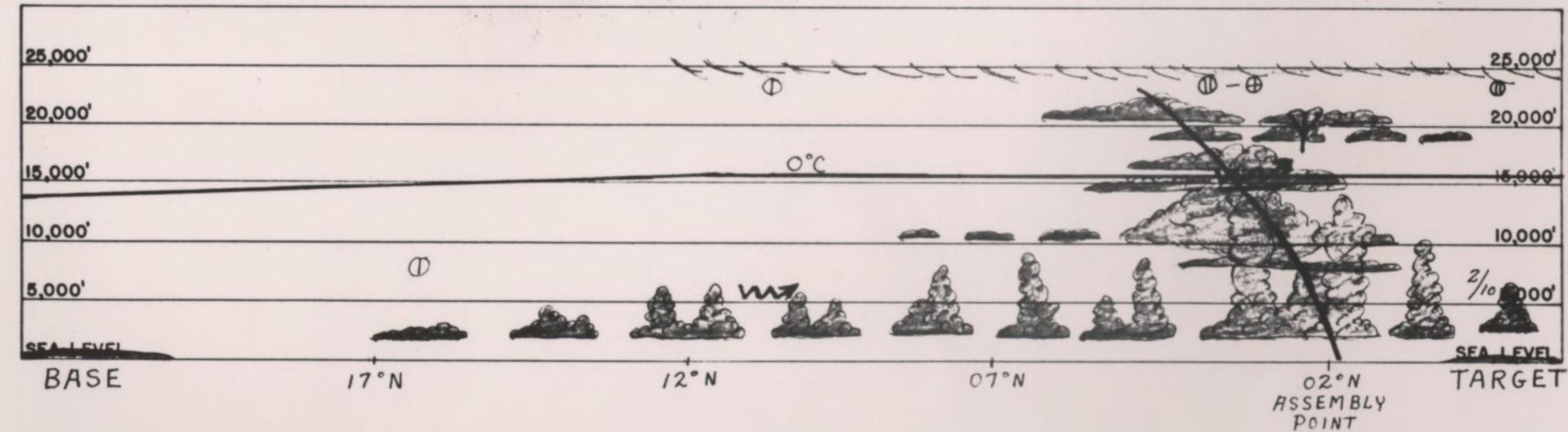
SECRET  
XX Bomber Command  
Weather as Forecast

MISSION NO.



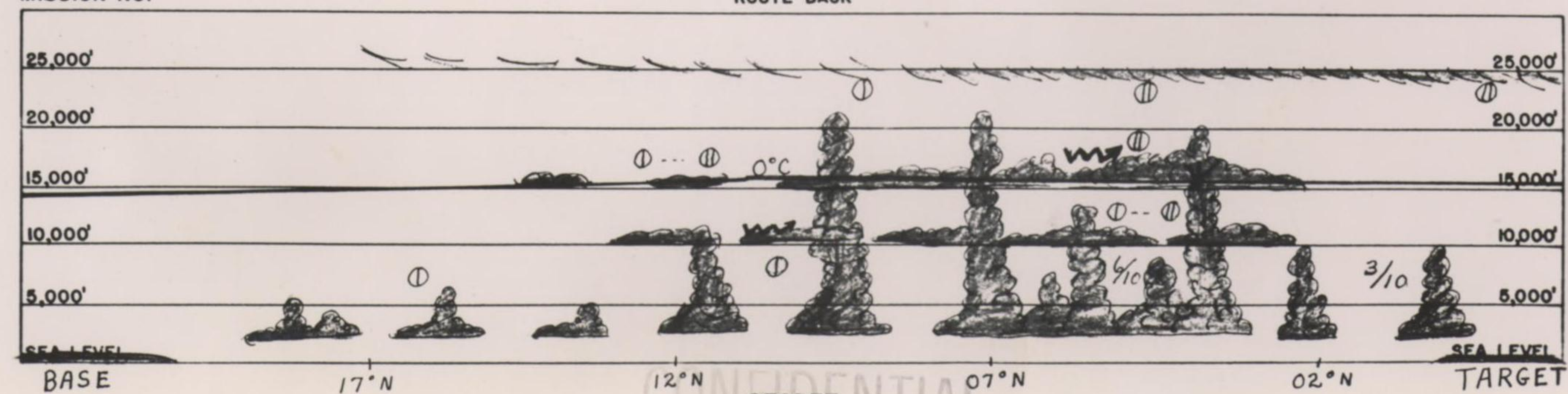
MISSION NO.

Weather as Encountered  
Route Out



MISSION NO.

Weather as Encountered  
Route Back

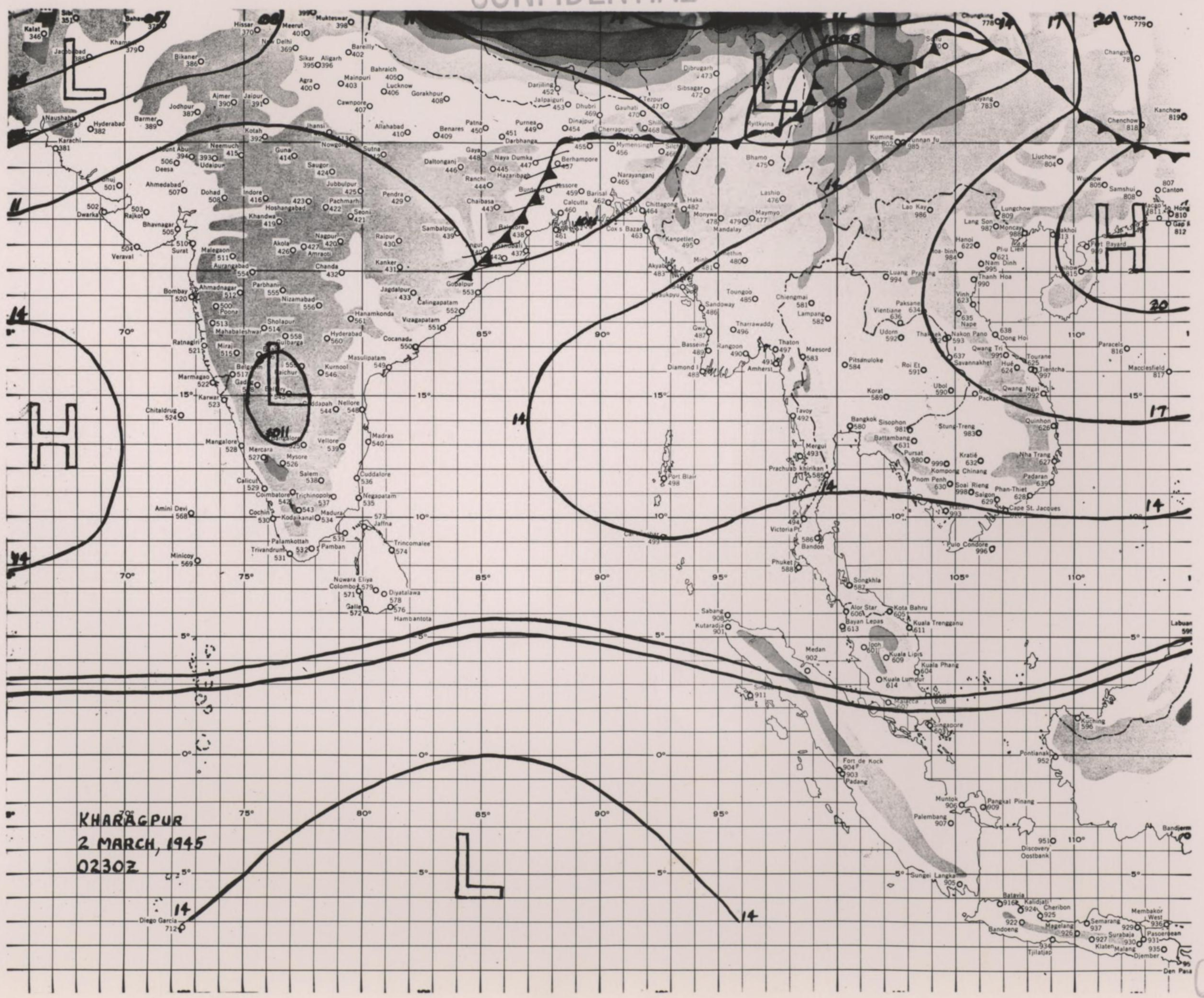


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2 MARCH, 1945  
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ANTEX

11

COMMUNICATIONS INFORMATION

\*\*\*  
\* Prepared by:  
\*  
\* Communications Section  
\*  
\* XX Bomber Command  
\*  
\*\*\*

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By *AN* NARA Date 12-8

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HEADQUARTERS  
XX BOMBER COMMAND  
APO 493

CONSOLIDATED  
SPECIAL MISSION  
REPORT OF

XX BOMBER COMMAND COMMUNICATIONS (RADIO) OFFICER

Date prepared: 6 March 1945. Date of Mission: 2 March.

Field Orders Number: 41.

PART I - TRAFFIC STATISTICS

1. Based on the greatest number of such messages which could be received the following tabulations indicate the number of aircraft accounted for by position reports, when 400 miles from base, and by bombs away messages:

a. Bombs away messages:

	<u>40th</u>	<u>444th</u>	<u>462nd</u>	<u>468th</u>	<u>Total</u>
No of a/c from which msgs could be expected:	12	18	8	17	55
No of msgs received:	5	6	8	7	26
No of a/c accounted for by messages:	11	18	8	17	54
Percentage of a/c ac- counted for by msgs:	91%	100%	100%	100%	98%

b. Position reports:

No of a/c from which msgs could be expected:	10	18	10	16	54
No of msgs received:	9	11	10	13	33
No of a/c accounted for by messages:	10	18	10	14	52
Percentage of a/c ac- counted for by msgs:	100%	100%	100%	87%	96%

c. Abort, attack and convoy sighting messages:

Abort:	0	2	2	3	7
Attack:	0	1	3	1	5
Convoy Sighting:	2	1	1	0	4

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PART II - DISTRESS TRAFFIC

2. Aircraft 555 of the 40th Bomb Group received battle damage over the target area at which time the radio operator was wounded. Another crew member then attempted to contact the ground station by CW, but failed to do so. It is believed this failure was due to the fact that no other experienced CW operator besides the regularly assigned radio operator was aboard the aircraft. The aircraft then used voice transmission on the assigned liaison channel and contacted aircraft 718 of the same group who successfully relayed the distress traffic for a/c 555 via CW. Aircraft 718 then escorted aircraft 555 to an alternate field where the aircraft landed safely.

3. Aircraft 678 of the 468th Bomb Group received battle damage over the target area and transmitted a distress message on the air-to-air command frequency. A/C 678 crashed about thirty minutes later. No further distress transmissions were made.

4. Aircraft 469 of the 468th Bomb Group received battle damage over the target and sent a distress message giving position and information that crew was bailing out. Ground station instructed aircraft to clamp key prior to bailout, which was done. Instructions to clamp key were given so that maximum time for D/F fix on aircraft could be obtained. The signal thus obtained continued for the duration of the mission, completely blocking that channel, thus forcing the balance of the aircraft to change frequency. This occurrence is discussed at further length in paragraph 11 below. Ten of the crew members who bailed out were picked up by airsea rescue craft.

PART III - VIOLATIONS OF CRYPTOGRAPHIC & TRANSMISSION SECURITY

5. As noted in paragraph 2 above, aircraft 555 of the 40th Bomb Group used voice transmission on an assigned CW channel. However it is believed this violation is excusable, as the transmissions were of an emergency nature.

6. Two aircraft of the 468th Group exchanged position reports and altitude in the clear, via command channels. The identity of these aircraft was not established by the intercepting radio operator, but it is suggested that this violation be brought to the attention of all aircrews and the seriousness of transmitting such information in the clear emphasized.

7. No violations of cryptographic security were noted.

8. No violations of the provisions of the XX Bomber Command Tactical Doctrine were noted.

PART IV - INTERFERENCE, SIGNAL STRENGTH, ETC.

9. Takeoff was at approximately 1700Z, 1 March 1945, and frequencies remained in use until 1830Z the following day. Static level was negligible for the duration of the mission with the exception of 12285 kilocycles on which a static level of W4 was logged, and while the aircraft were passing through local storms when outward bound. The assigned eight megacycle frequencies faded to an S1 level as the target area was approached, but built up appreciably on the return to base.

10. Strong interference from the British Naval Station GZH was reported on 8495 and 12285 kilocycles. Theater Headquarters was requested to take action on this interference and this Headquarters has been notified that action is being taken to eliminate this interference in the future.

- 2 -

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11. As mentioned in paragraph 4 above, one eight megacycle channel was completely blocked when an aircraft in distress clamped down the transmitter key prior to the crew bailing out. The signal thus started, at approximately 0400Z, was heard continuously until 1630Z, at which time it shifted six kilocycles and was not longer monitored. Experience of this Command is that the AN/ART-13 transmitter cannot normally be keyed continuously for longer than a twenty minute period without cutting off due to overheating. Also the signal continued long after the aircrafts gasoline supply would have been exhausted. For these reasons it is believed that enemy monitoring stations, taking advantage of a signal already started by a legitimate source, chose to put a transmitter on the air on the same frequency, as a deception measure. It is not believed that this occurrence was primarily a jamming measure, inasmuch as another eight megacycle frequency, in the near vicinity remained clear, and because no attempts at jamming of this Commands frequencies in this Theater have been previously established. Direction Findings cuts established the offending station in the vicinity of Rangoon, which also substantiates the belief that the signal was of enemy origin.

PART IV - RADIO AIDS TO NAVIGATION

12. Statistical data on radio aids to navigation is as follows:

a. Radio Homing Beacons:

<u>Location</u>	<u>Power</u>	<u>No of a/c reporting</u>	<u>Average Initial contact</u>	<u>Extreme Initial contact</u>
Chakulia	1200W	10	350 miles	650 miles
Dum Dum	3000W	4	400	600
Dudhkundi	25W	5	90	200
Chittagong	1200W	2	245	250
Kharagpur	1200W	24	300	437
Pairdoba	2000W	3	230	350

b. Only one aircraft reported using a radio range. The range used was at the Kharagpur installation which was initially contacted at a distance of 280 miles.

c. Three requests for D/F aid were made. No unusual occurrences were noted.

d. Air-to-air homing was employed by the 444th Group only, which had two aircraft transmit homing signals. Five aircraft established rendezvous, using these transmissions, from an average distance of forty miles.

PART V - MALFUNCTIONS

13. No malfunctions of communications equipment were reported by the 40th Group.

14. 444th Group:

a. A/C 273 experienced difficulty with the number two transmitter of the SCR-274N set in that the transmitter would no longer stay loaded once tuned. The trouble could not be found and the transmitter was not repaired in flight.

b. A/C 496 had the radio compass flat-top sense antenna shot away. The command set fixed antenna was used as a substitute

- 3 -

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by connecting the compass to that antenna with a jumper wire.

c. A/C 485 had the liaison antenna snap when the aircraft landed at a secondary base for refueling prior to return to base. The antenna was not repaired, the trailing wire antenna being used in its place during return to base.

15. 462nd Group:

a. A/C 457 had the down lead of the radio compass flat top antenna break during flight. Command fixed antenna was substituted by use of a jumper wire.

b. A/C 473 had a faulty AN/ART-13 transmitter which would not zero beat to the crystal check points. Not repairable in flight

16. 468th Group:

a. A/C 276 experienced an interphone amplifier breakdown due to a bad tube. The tube was replaced in flight and the interphone worked satisfactorily.

PART VI - AIR GROUND FACILITIES

17. Mission 41 was the first mission in which a comparatively large number of aircraft worked in conjunction with the newly established XX Bomber Command Air-ground station. This station which is located at the XX Bomber Command CP operates on two channels using the call signs and frequencies of the 444th and 468th Bomb Groups, which were taken over when the Group ground stations were decommissioned. The change involved no revision of the present provisions of this Command's tactical doctrine and tactical traffic was handled with a minimum amount of error. The major difficulty encountered was in the passing of air-ground traffic from the Bomber Command CP to the Bomb Group CP's via the teletype loop connecting the various CP's mentioned. A considerable backlog of teletype traffic occurred from time to time, especially at such times as when such messages as bombs away messages were received in close proximity. However, it is believed that the experiences of this mission will enable the present system to be so modified that the difficulty mentioned above will not reoccur.

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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

Table B - Photographic Results

Table C - Serviceability

Table D - Malfunctions

III - RADAR PHOTOGRAPHIC ANALYSIS CHARTS\*\*

\* Prepared by Radar Section, XX Bomber Command

\*\* Prepared by Target Intelligence Unit,  
IX Bomber Command

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Authority **NND 760063**

By **VAN** NARA Date **12-8**

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HEADQUARTERS  
XX BOMBER COMMAND  
APO 493

CONSOLIDATED  
SPECIALIST MISSION  
REPORT OF

XX BOMBER COMMAND RADAR OFFICER

Date Prepared: 7 March 1945 Field Orders No. 41  
Date Of Mission: 2 March 1945

I - RADAR INFORMATION

A - Navigation and Bombing

1. The primary visual target, Naval Base Area, Singapore, provided an excellent radar target. Bombing of this target by radar was prohibited, however, due to the bombing limitations placed on the King George VI Dry Dock. A primary radar target, Oil Tanks on Bakum Island, Singapore, was chosen, therefore, in case weather conditions over the Singapore area made radar bombing necessary. The radar target was also an excellent target for radar bombing.

2. Weather conditions over the target area were CAVU to 2/10 cover. The larger percentage of the bombing was therefore visual, with two (2) aircraft releasing by radar. The radar-bomb-sight procedure was used in all cases with the radar operator calling off at least three sighting angles before the target became visible to the bombardier.

3. Radar was used considerably over the assembly point and directing the aircraft to the initial point and thence on the bombing run, for weather conditions over this area were reported as 10/10 cover. A number of severe storms were encountered again over the route and frequently identified by radar, thus aiding navigation through the less turbulent areas.

B - Scope Photography

1. A number of radar scope photographs were returned from the mission with very satisfactory results obtained. A total of twenty-three (23) cameras were installed, returning twelve (12) sets of photographs. Eleven (11) sets were entirely useable and tracing of the bombing run was possible on six (6) of these eleven (11) sets.

2. The Singapore Area was clearly identifiable on the photographs as well as the assembly and initial points.

C - Serviceability

1. Radar system performance was maintained at its high operational level. A total of fifty-one (51) systems or ninety-one (91) per cent were operational over the target area. Thirteen (13) complete and partial malfunctions were reported, while three (3) systems were repaired in flight.

2. There were no malfunctions of the auxiliary radar equipment.

RA - RADAR TABLE

A - Bombing

Total A/C Bombing	55
A/C Bombing Naval Base Area (Visual PT) Visually	50
A/C Bombing Bukum Island (Radar PT) Radar	1
A/C Bombing Batu Arang (ST) Visually	1
A/C Bombing Batu Arang (ST) Radar	1
A/C Bombing Batu Arang (ST) E.T.A.	1
A/C Bombing Khao Huagang (LKT) Visually	1
Total A/C Bombing by Radar	2

B - Photographic Results

DATA	40th Gp		444th Gp		462nd Gp		468th Gp		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
No. Cameras Installed	7		8		5		3		23	
K-24 Cameras	2		3		5		3		13	
K-35 Cameras	5		5		0		0		10	
No. Cameras in Abort, Early Return & Missing A/C *	0	0	0	0	2	40	0	0	2	9
No. Cameras Completing Mission *	7	100	8	100	3	60	3	100	21	91
No. Cameras in Radar & Camera Malfunction Aircraft #	2	29	3	25	2	67	1-a	33	7	33
Sets Pic Returned #	5	71	6	75	1	33	0	0	12	57
No Negatives Ret.	52		142		26		0		320	
Sets Pic Useable **	5	100	5	83	1	100	0	0	11	92
Sets Pic Tracing Bombing Run	2	40	3	50	1	100	0	0	6	50

\* Percentage based on cameras installed.  
 # Percentage based on cameras completing mission.  
 \*\* Percentage based on sets of pictures returned.  
 a - 2 A/C radar operator had trouble operating cameras.

C - Serviceability

DATA	40th Gp		444th Gp		462nd Gp		468th Gp		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
A/C Airborne	12		20		12		20		64	
A/C Reporting	12		20		10		20		62	
APQ-13 Operative at Take-Off *	12	100	20	100	9	90	20	100	61	99
A/C Bombing	12		18		8		17		55	
A/C Reporting Bombing	12		18		8		17		55	
APQ-13 Operative Over Target #	10	84	17	95	7	88	17	100	51	93
APQ-13 Unrepairable Failures:										
Completely Inop. #	1	8	1	6	2	25	1	6	5	9
Partially Inop. #	1	8	4	22	2	25	1	6	8	14
Total	2	16	5	28	4	50	2	12	13	23
APQ-13 Repaired in Flight	0		1		1		1		3	
Auxilliary Equipment Failures	0		0		0		0		0	

\* Percentage based on A/C reporting.  
 # Percentage based on A/C reporting bombing.

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D - Malfunctions

DATA	40th Group	444th Group	462nd Group	468th Group	Total
<u>Between Take-Off &amp; Target</u>					
Completely Inoperative:					
Defective Crystal	1				1
Antenna Drive Motor Cable		1			1
Spinner Rotation & Tilt			1		1
Partially Inoperative:					
723-A Tube	1				1
Transmitter Current High		1			1
Sector Scan		1			1
Azimuth Stabilization		1			1
Dome Retract Inoperative			1		1
Main Scope Inoperative				1	1
<u>Between Target &amp; Landing</u>					
Completely Inoperative:					
Loss of Sweep			1		1
Radome Flak Damage				1	1
Partially Inoperative:					
Navigator's Scope		1			1
Pressurization			1		1
<u>Repaired In Flight</u>					
Inverter Changed		1			1
Replaced Fuse 11-8			1		1
Transtat Repaired				1	1
<u>Summary, APQ-13 Malfunctions</u>					
Completely Inoperative	1	1	2	1	5
Partially Inoperative	1	4	2	1	8
Repaired in Flight	0	1	1	1	3
Total Malfunctions	2	6	5	3	16
<u>Malfunctions, Auxiliary Equipment</u>					
	0	0	0	0	0

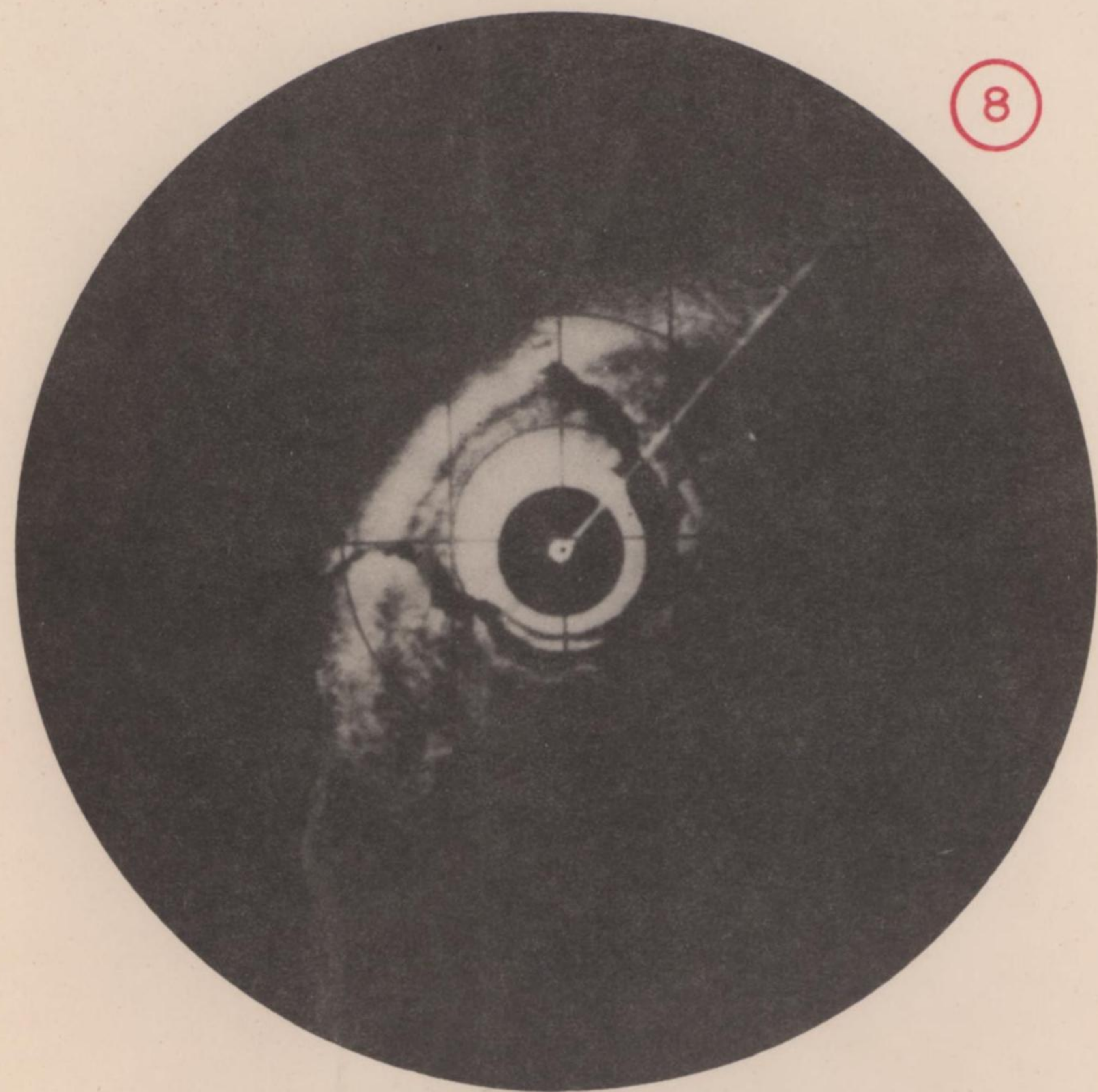
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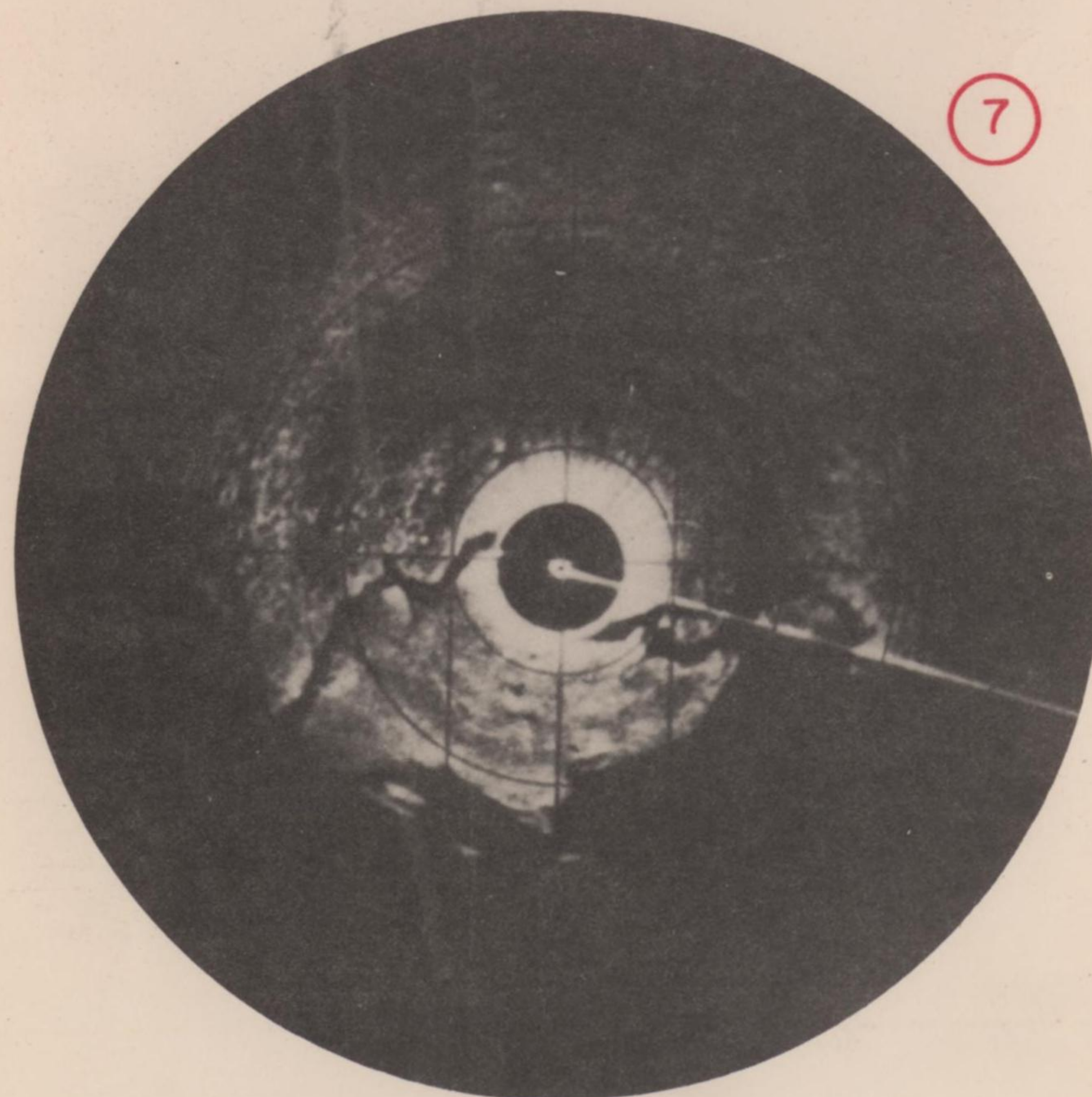
Authority NND 760063

By VAN NARA Date 12-8

718- 2/3/45  
ALL ALTITUDES 22,000'



HEADING 41° MAG. SWEEP 30 MILES



HEADING 102° MAG. SWEEP 30 MILES

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# RADAR PHOTOGRAPH ANALYSIS SINGAPORE AREA - MALAY STATES MISSION NO. 41

R 92.2 - SHEET

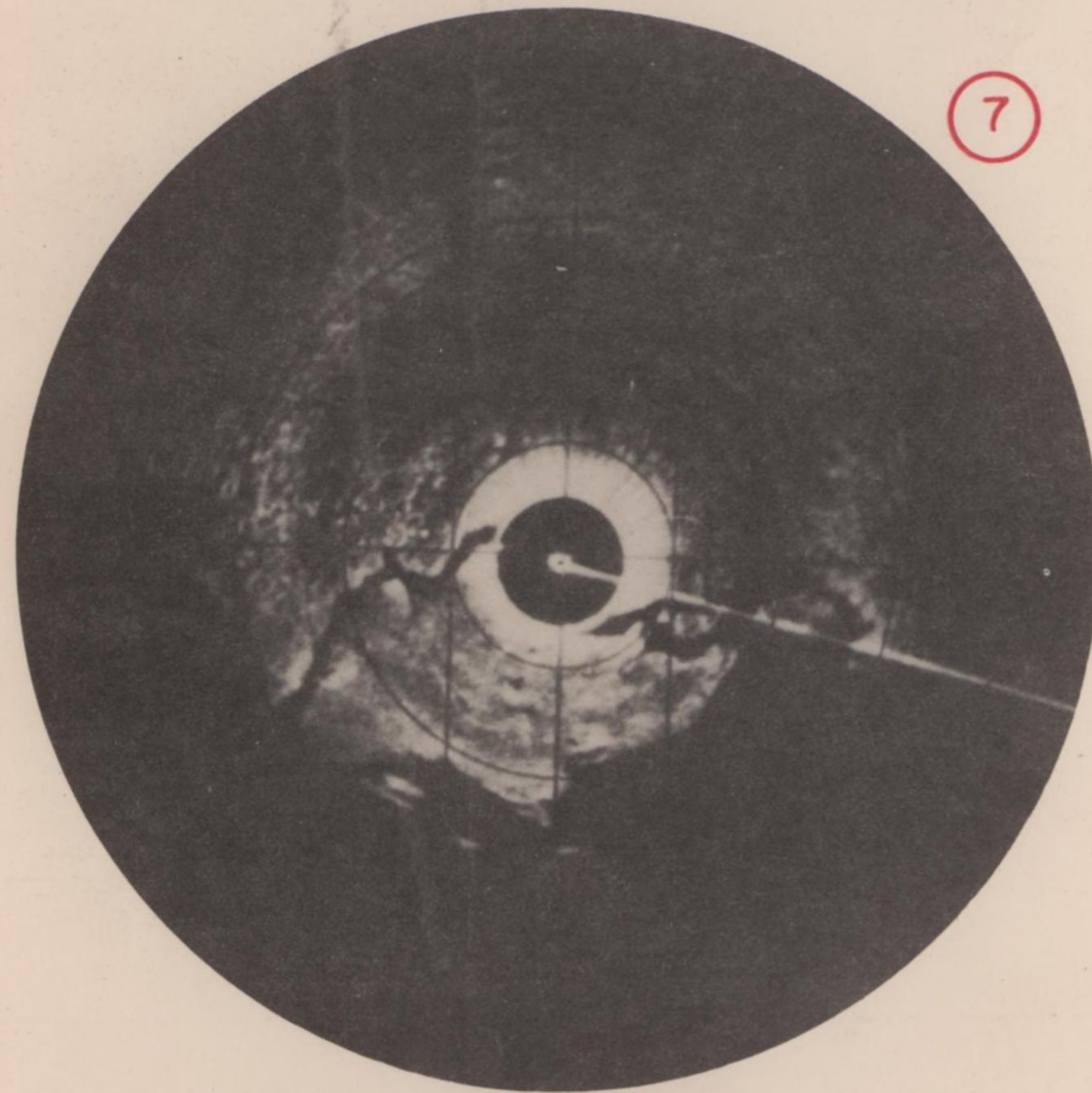


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Authority NND 760063  
By VAN NARA DAA 12-8

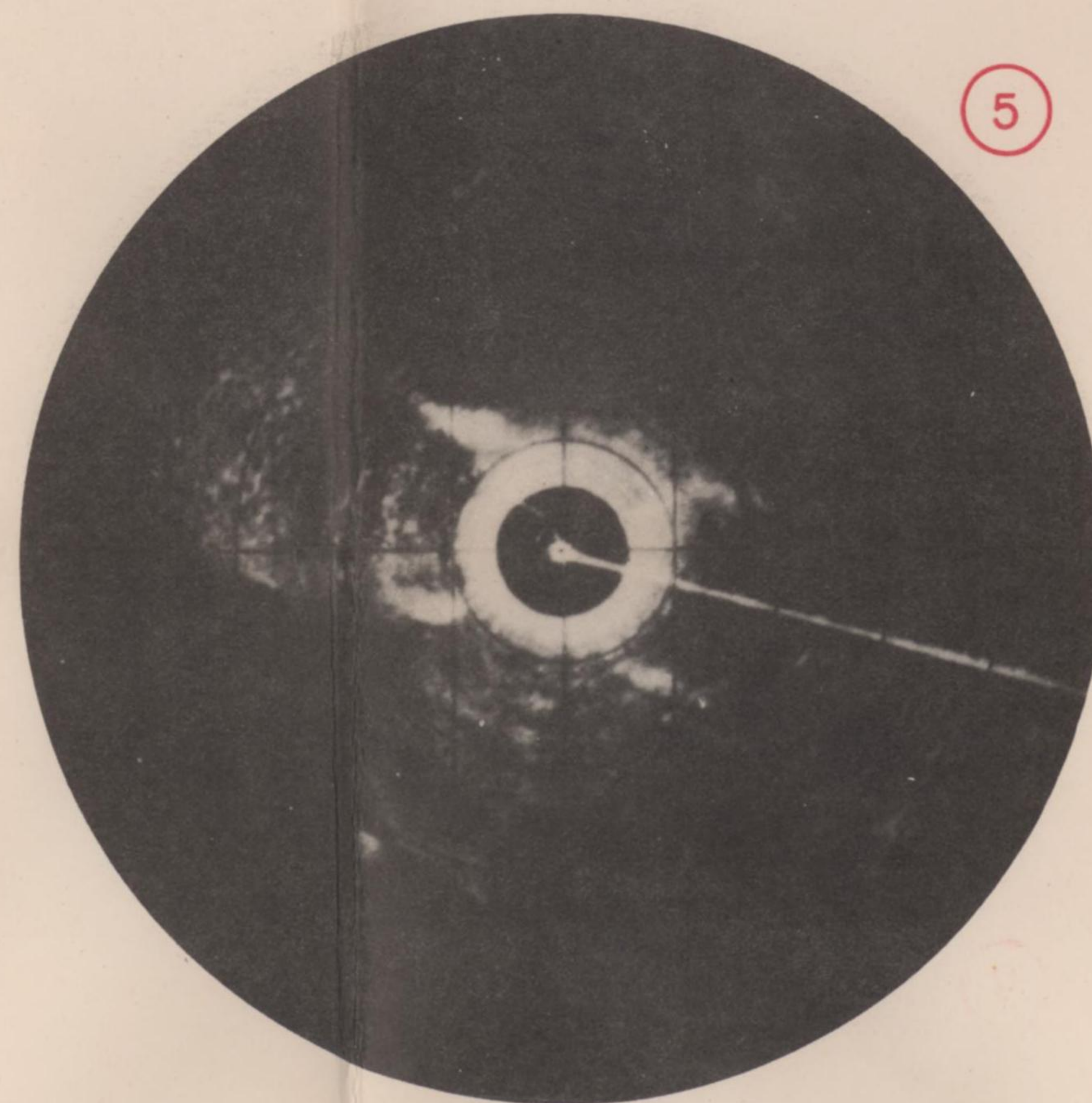
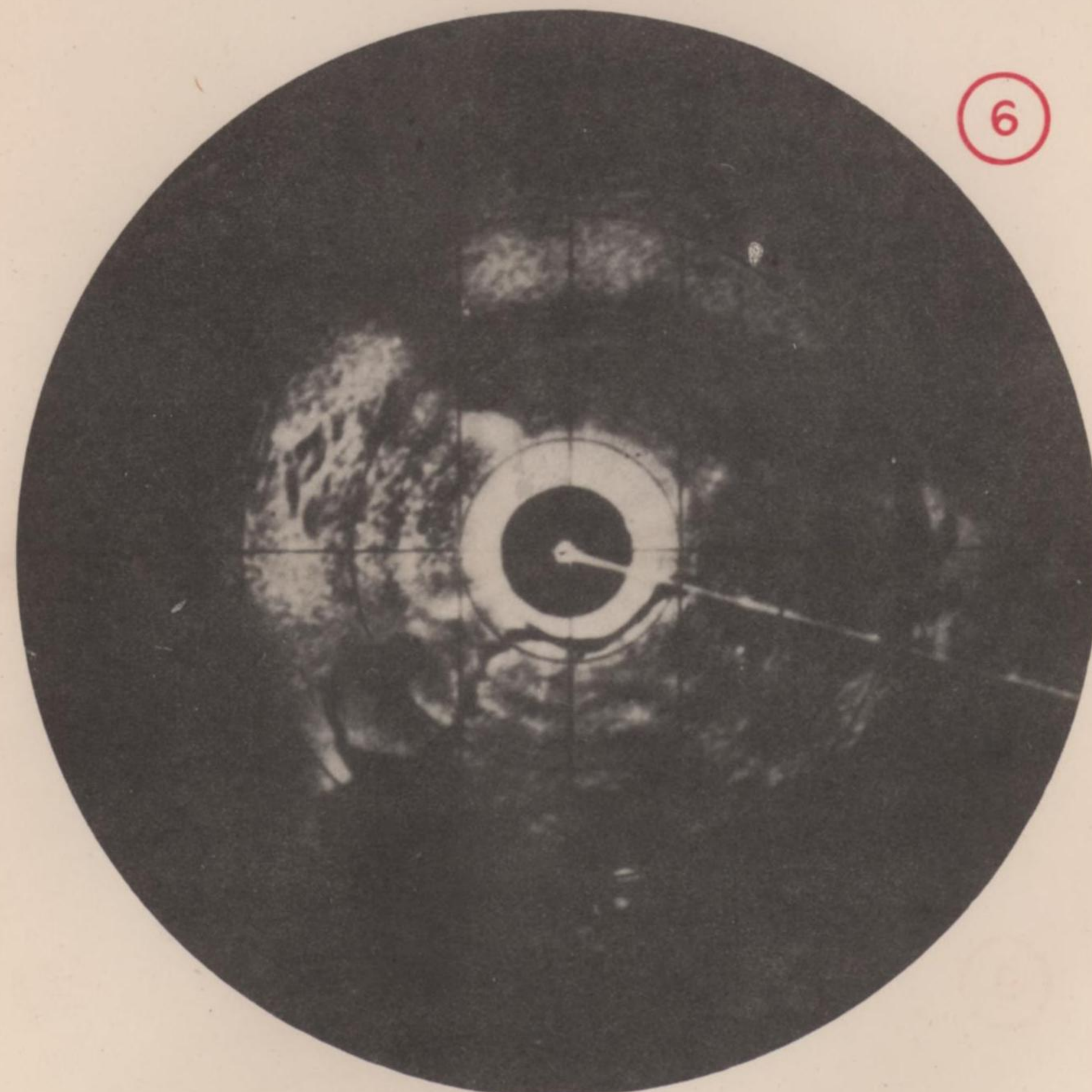




HEADING 41° MAG. SWEEP 30 MILES



HEADING 102° MAG. SWEEP 30 MILES



HEADING 104° MAG. SWEEP 30 MILES

HEADING 104° MAG. SWEEP 30 MILES

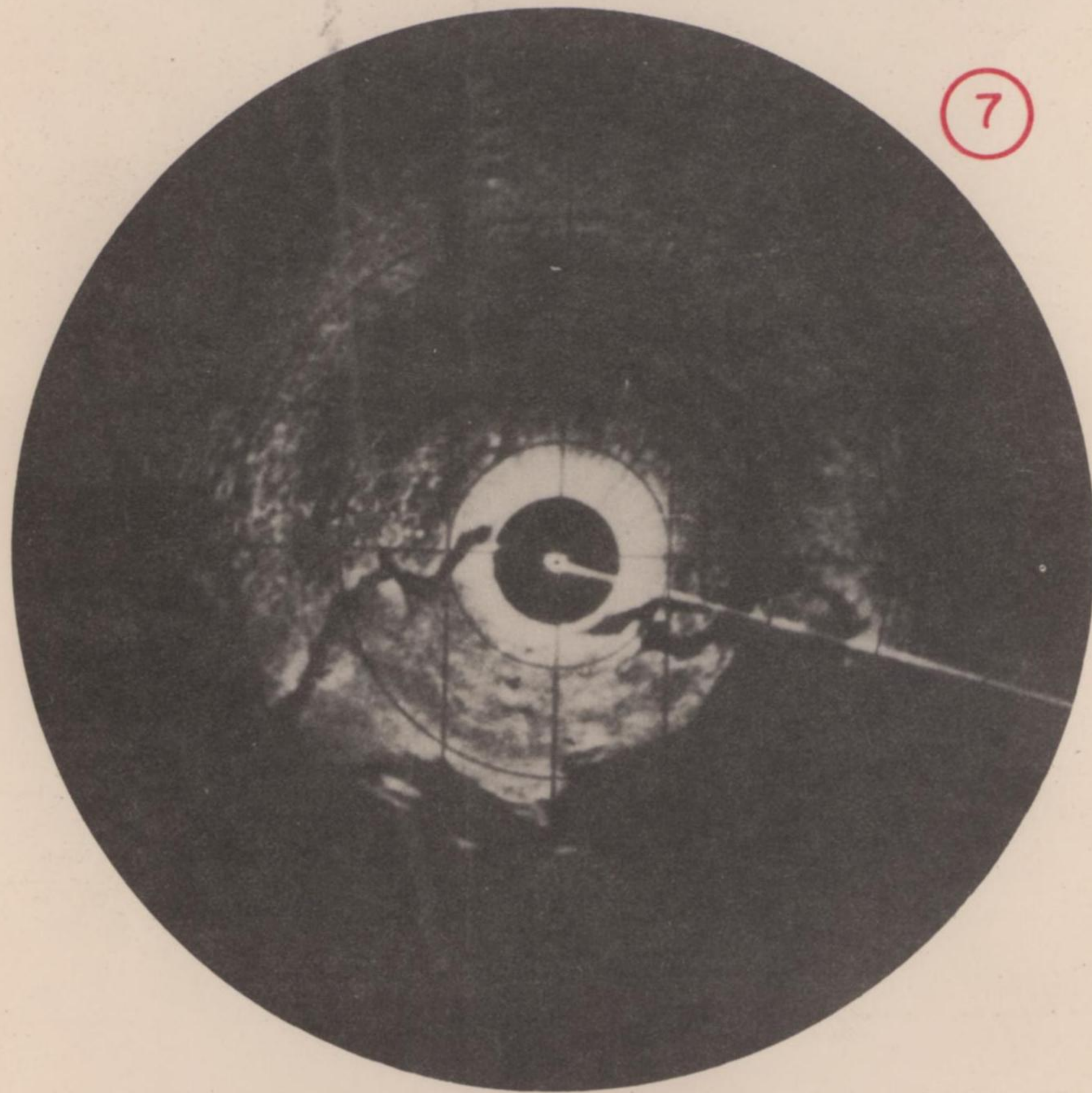
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PREPARED BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX BOMBER COMMAND

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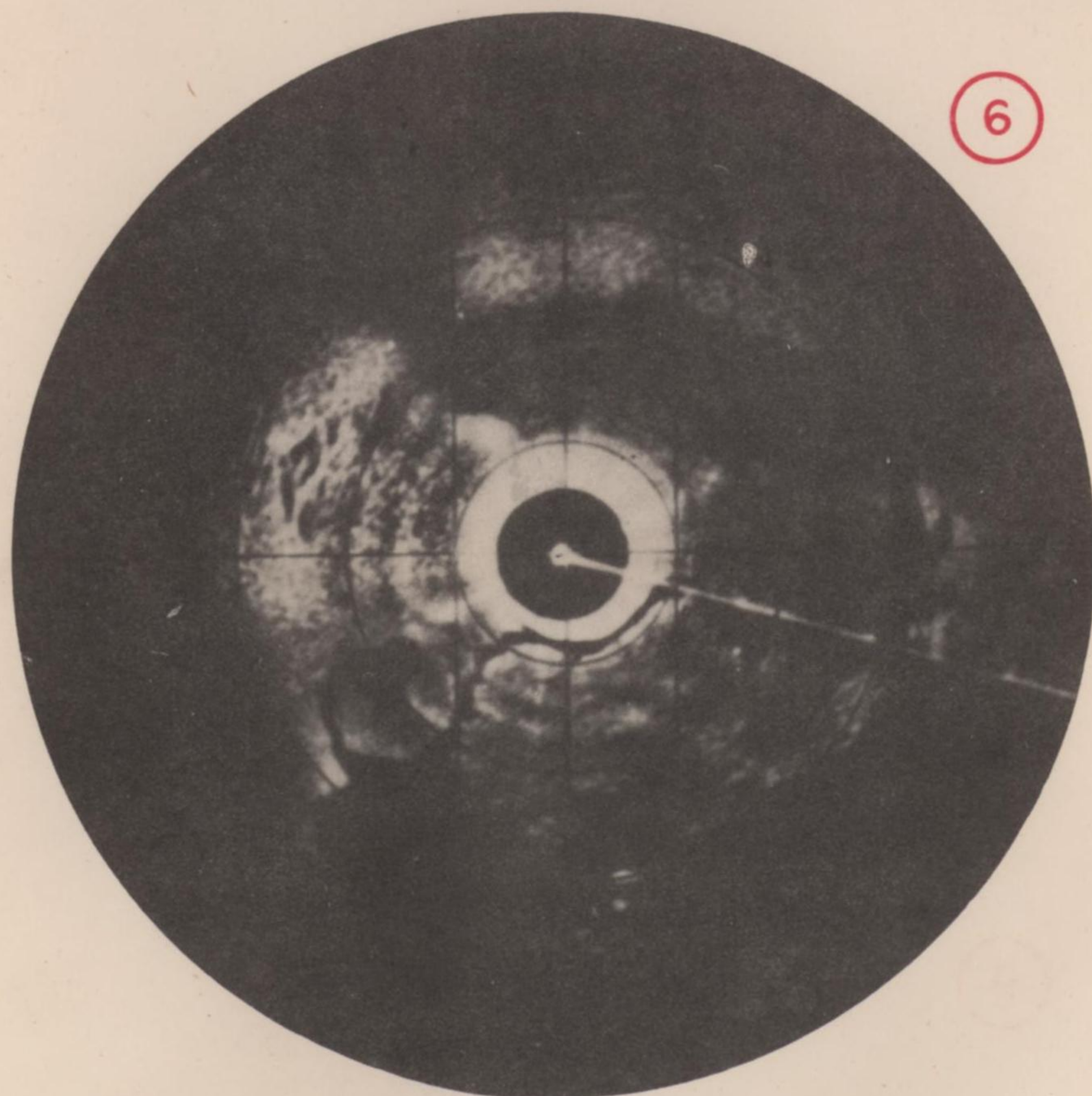
DECLASSIFIED  
Authority NND 760063  
By VAN NARA Dec 12-8

HEADING 41° MAG. SWEEP 30 MILES



DECLASSIFIED  
Authority NND 760063  
By VAN NARA Del 12-8

HEADING 102° MAG. SWEEP 30 MILES



HEADING 104° MAG. SWEEP 30 MILES

HEADING 104° MAG. SWEEP 30 MILES

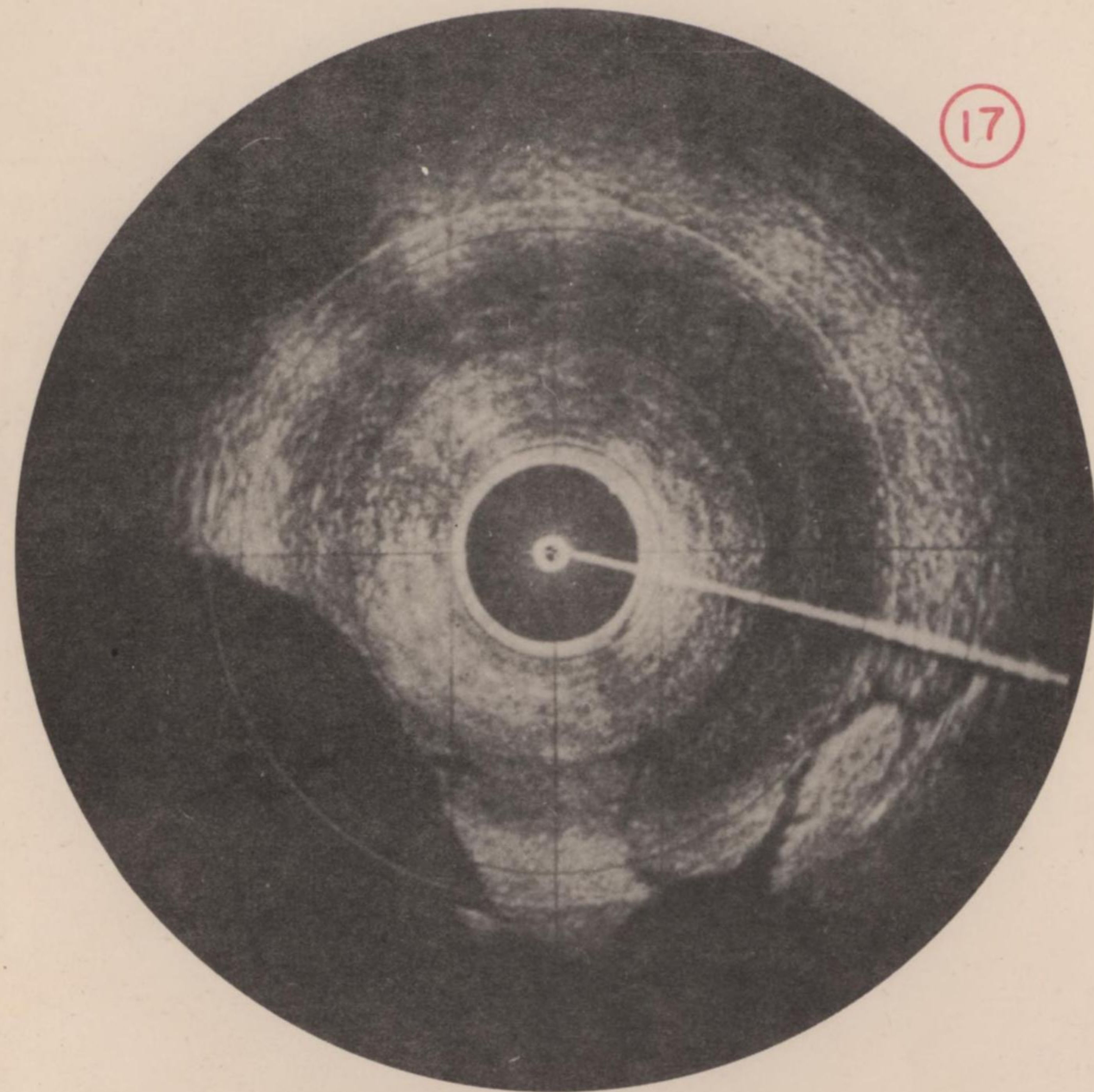
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PREPARED BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX BOMBER COMMAND

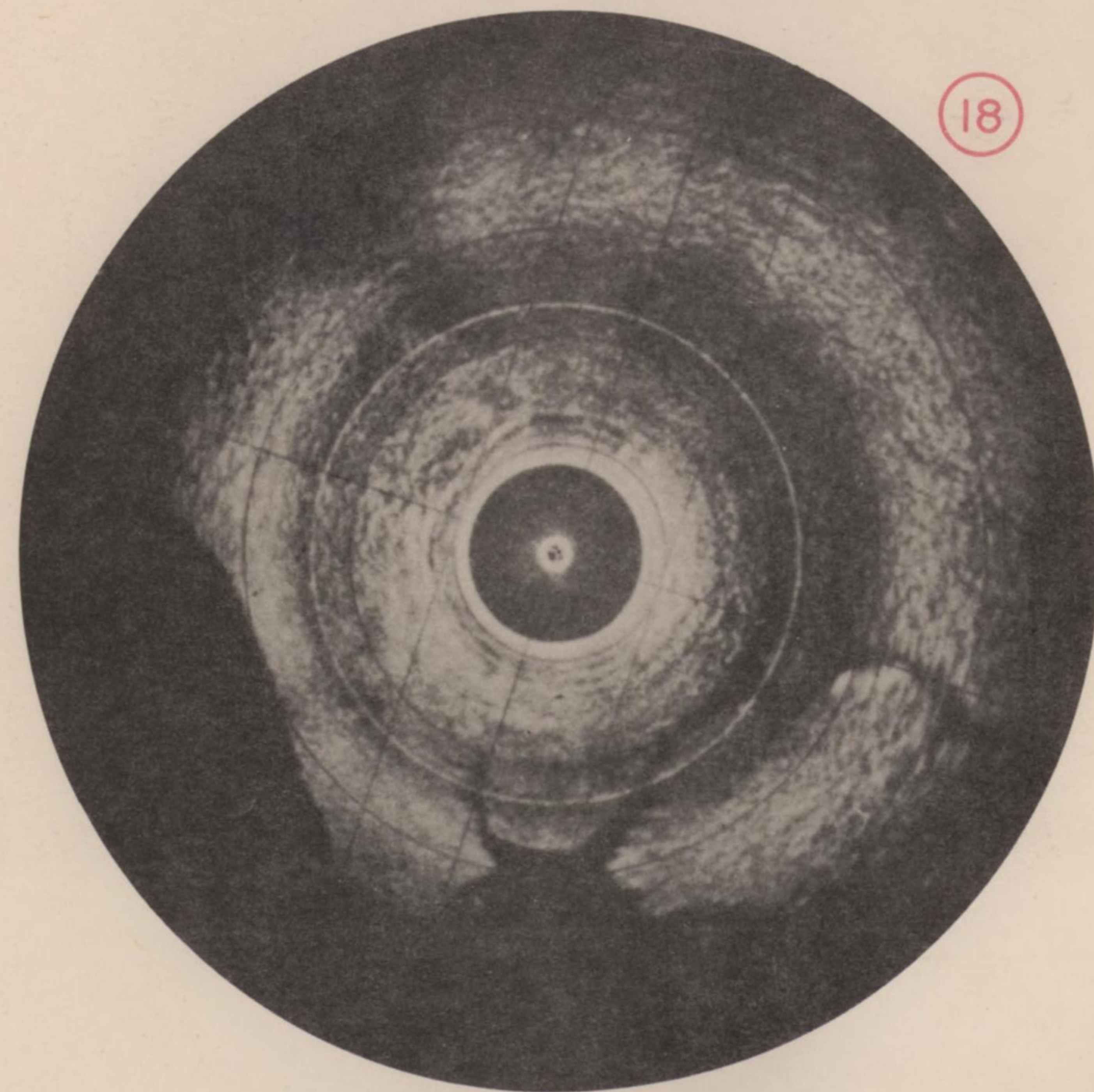
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451 2/3/45

ALL SWEEPS 20 MILES. ALL ALTITUDES 22,400'



HEADING 104° MAG.



HEADING 101° MAG.

CONFIDENTIAL  
RADAR PHOTOGRAPH ANALYSIS  
SINGAPORE AREA - MALAY STATES  
MISSION NO. 41



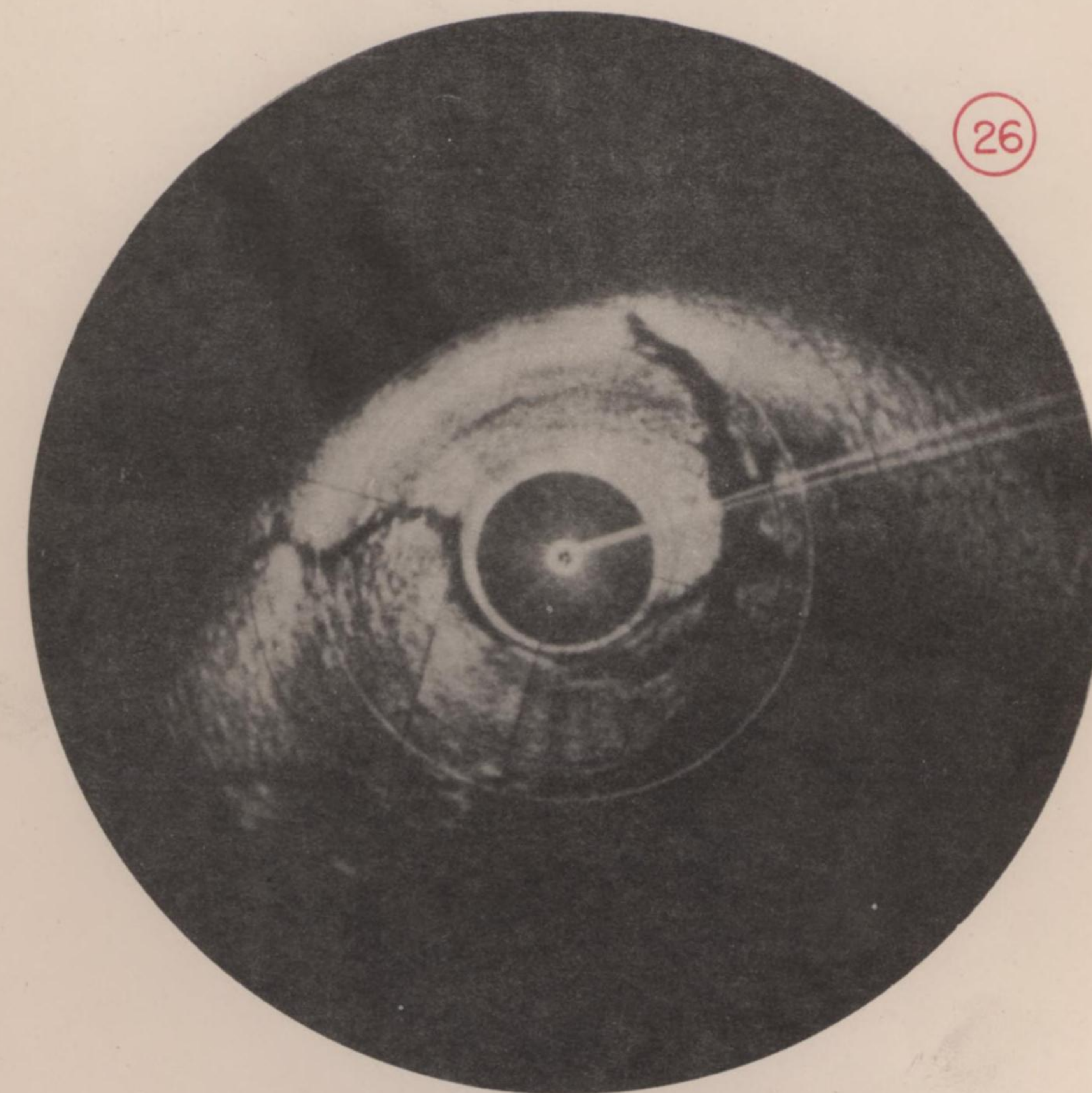
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By VAN NARA Dec 12-8

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 RADAR PHOTOGRAPH ANALYSIS  
 SINGAPORE AREA - MALAY STATES  
 MISSION NO. 41

R-92.2 SHEET R



HEADING 71° MAG.



HEADING 101° MAG.

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 By VAN NARA DAA 12-8

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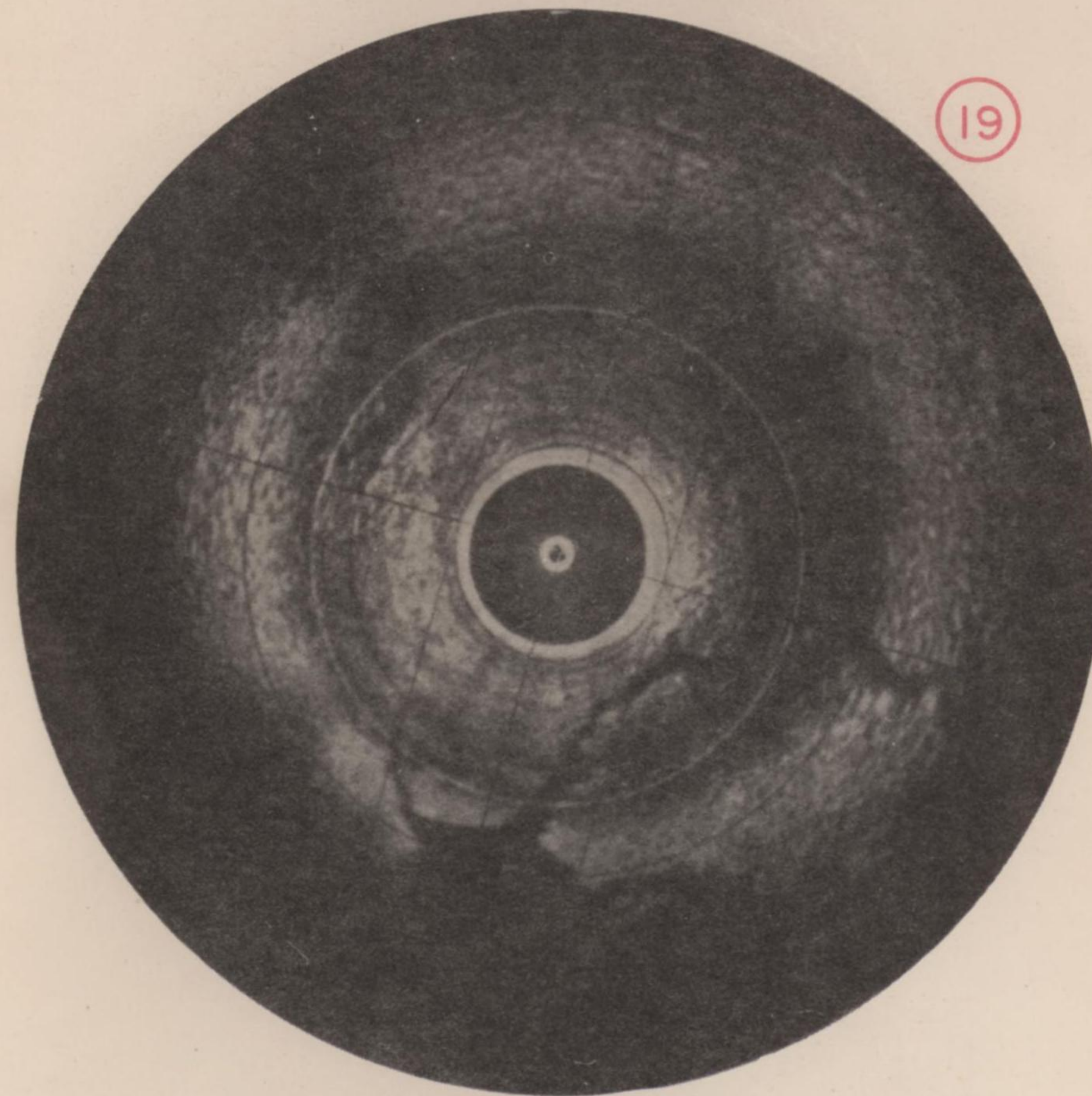


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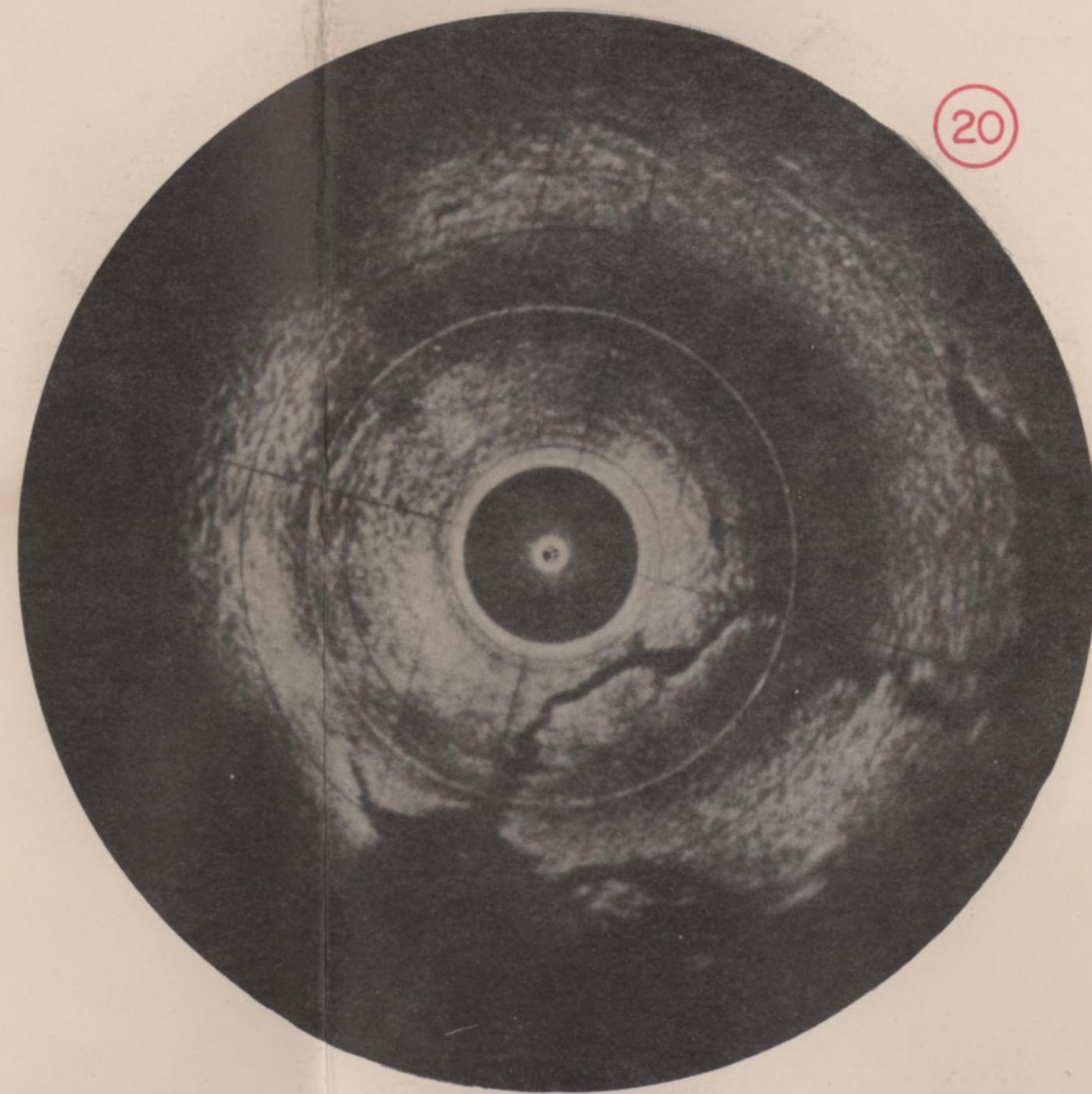
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Authority NND 760063  
By VAN NARA DAA 12-8

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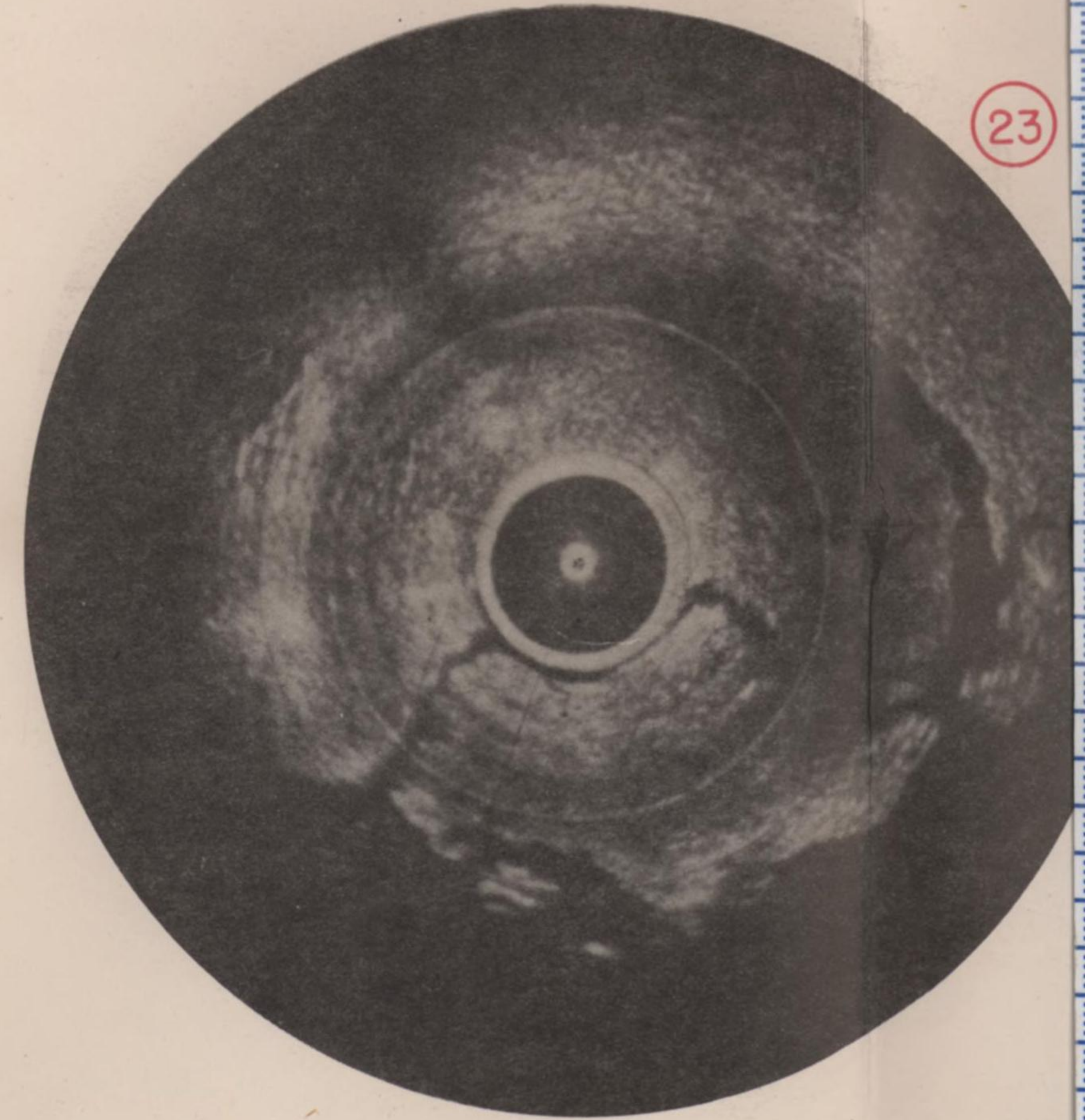
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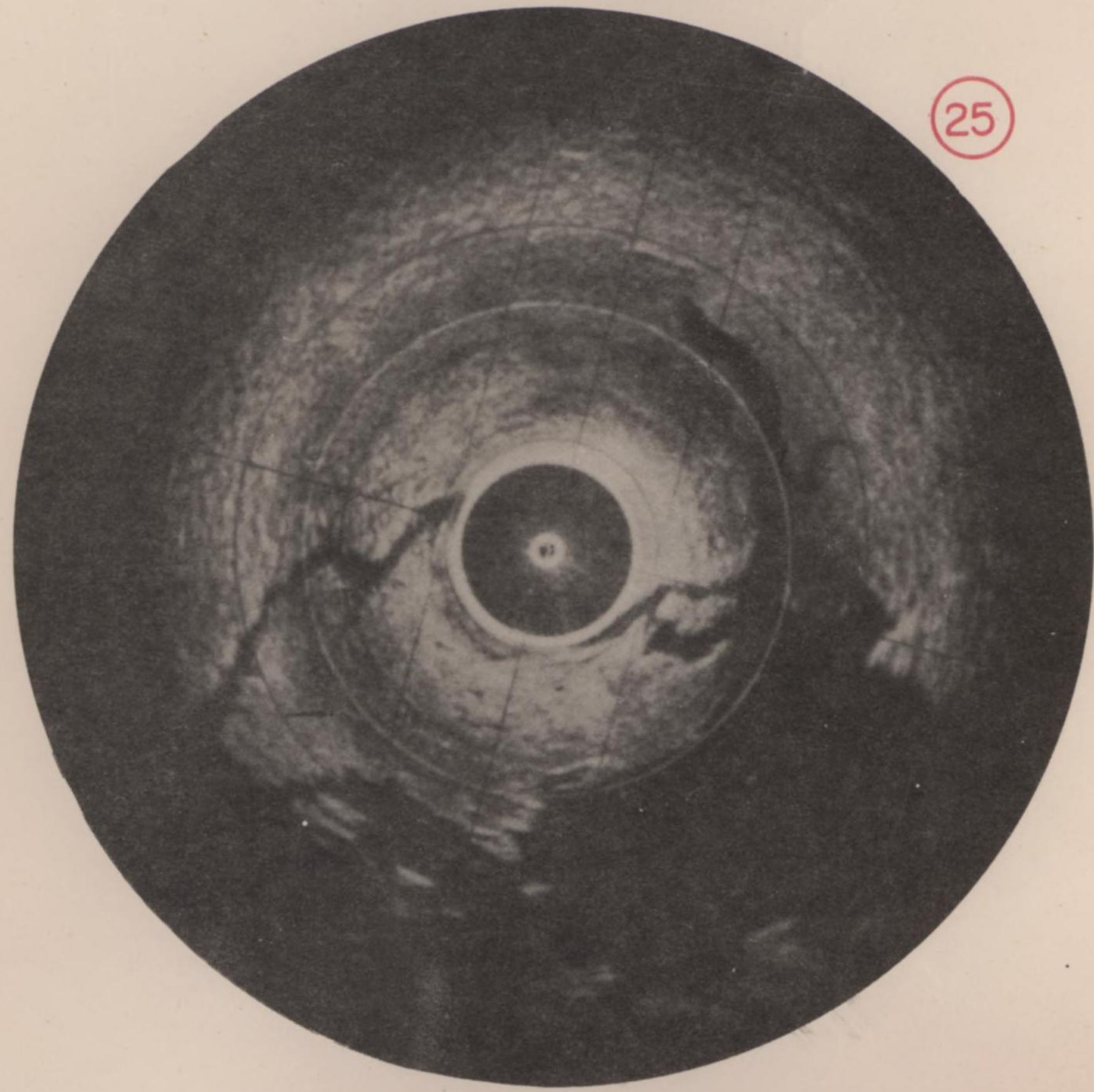


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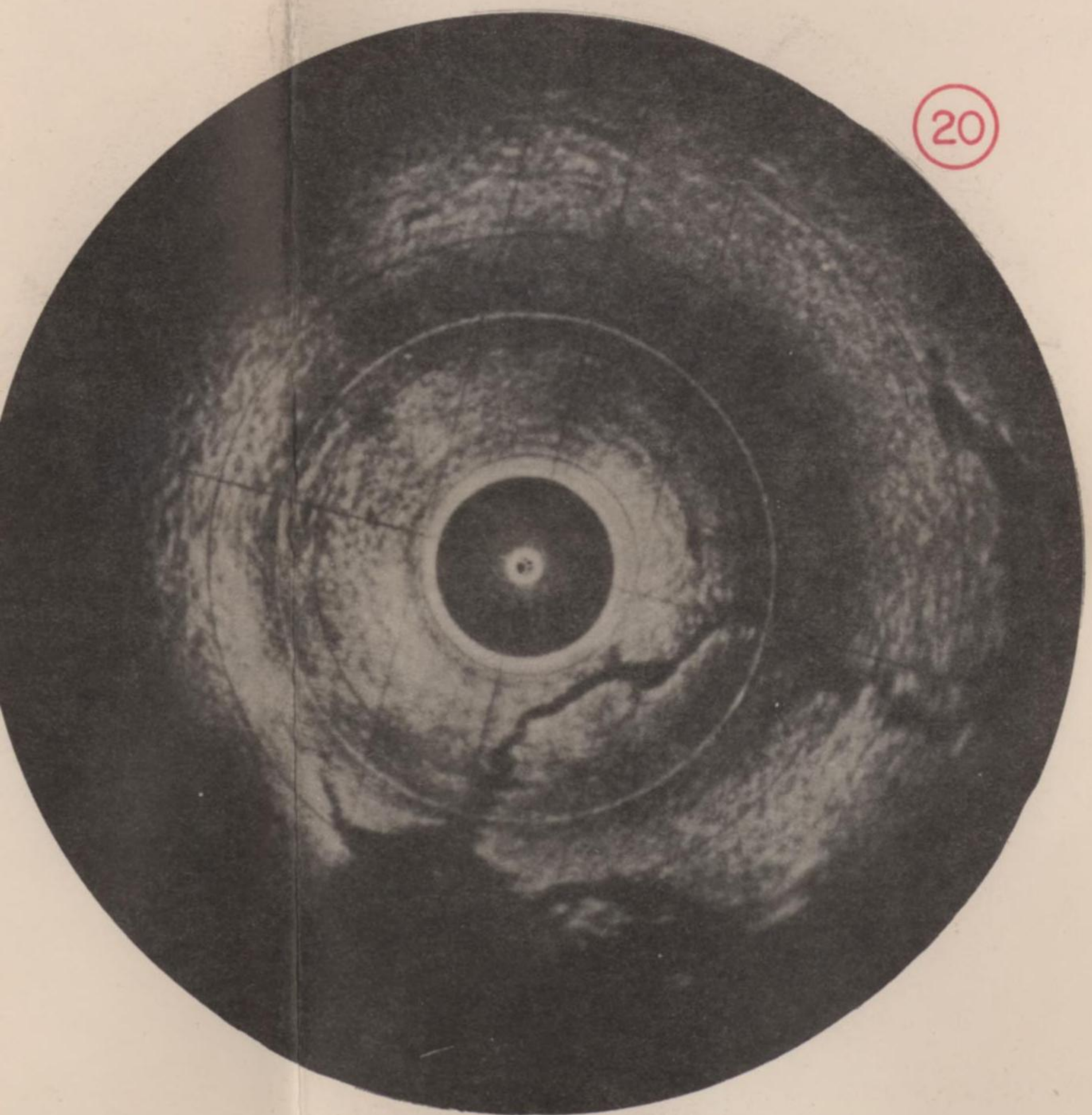


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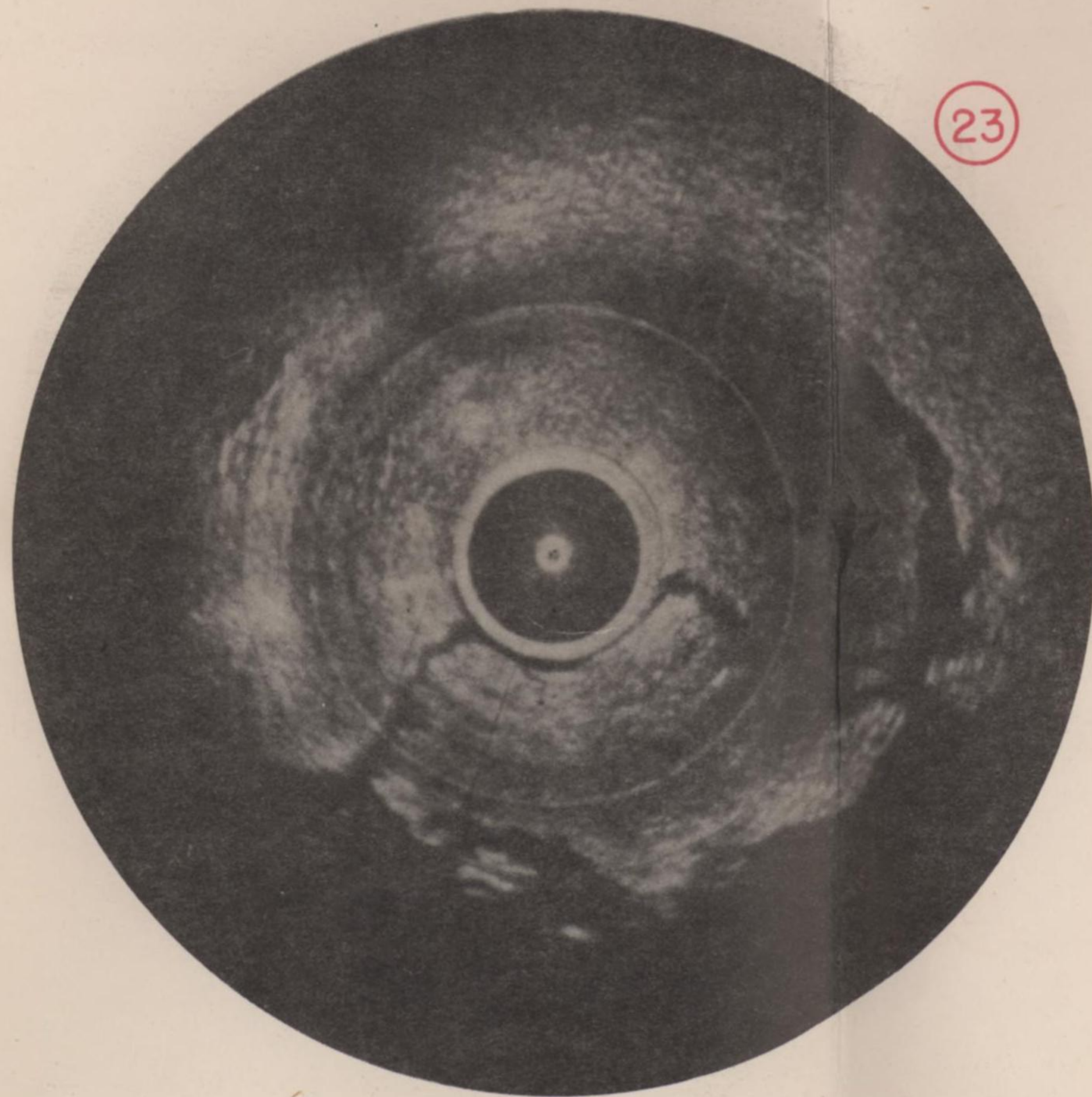
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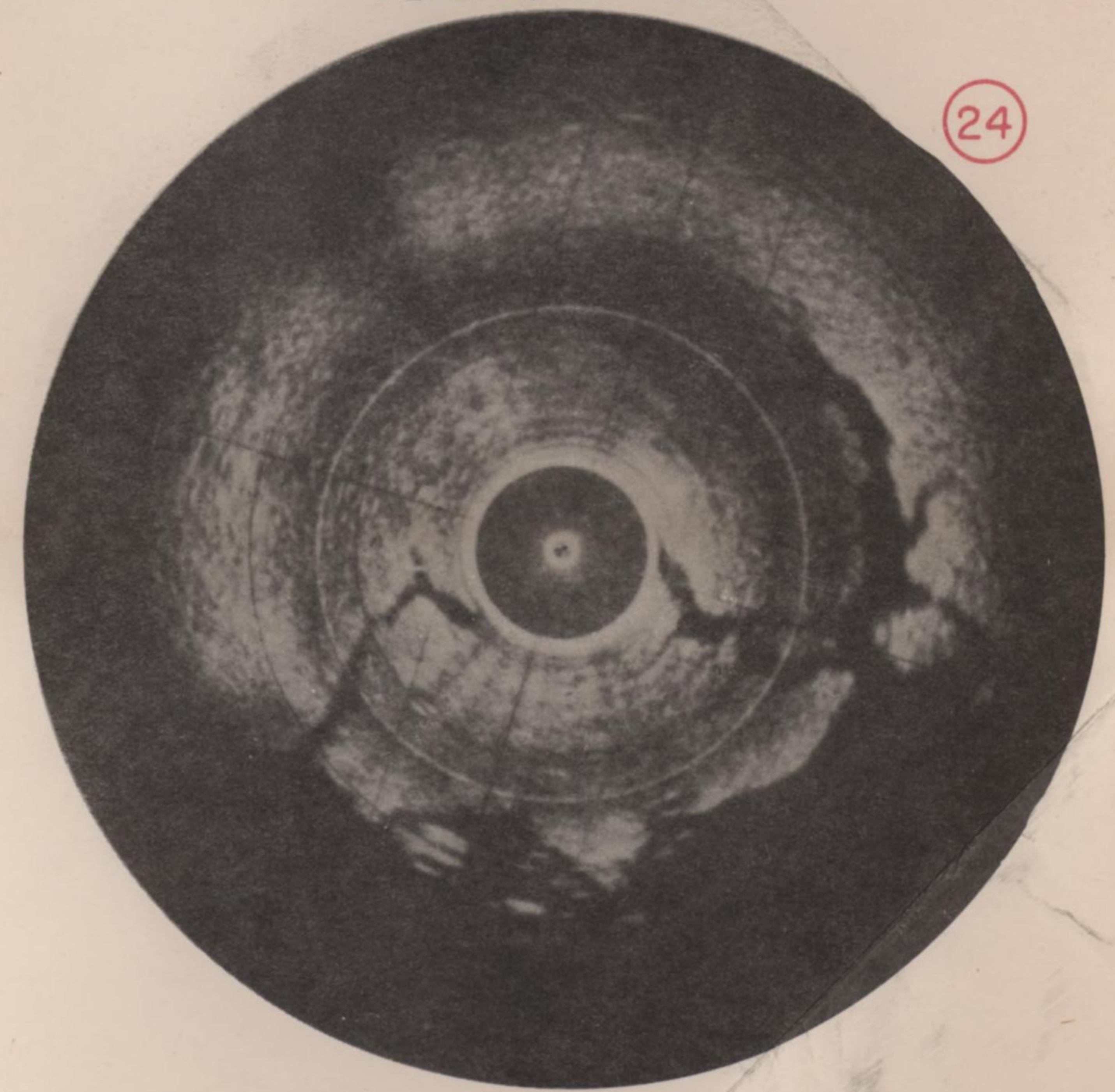
20

HEADING 101° MAG.



23

HEADING 101° MAG.



24

HEADING 101° MAG.

PREPARED BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX BOMBER COMMAND  
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Authority NND 760063  
By VAN NARA Del 12-8

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

ANNEX

G

RCM INFORMATION

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*****  
* Prepared by: *  
* RCM Section *  
* XX Bomber Command *  
*****
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C O N F I D E N T I A L

CONFIDENTIAL

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

15 March 1945

SUBJECT: RCM Report - Combat Mission No. 41, Singapore,  
2 March 45 - Daylight.

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

A. General

Four RCM search aircraft, three of them equipped with bottom mount D/F antennas, participated in this mission. The RCM observers searched for early warning radar enroute to and from the target and for radar fire control equipment while in the target area.

B. Results

The early warning radar sites in the Andaman Island, Penang Island and Singapore island areas were in operation and undoubtedly furnished the enemy adequate warning of the impending attack.

1. South Andaman Radar: 101/736/15. D/F cuts suggest a new radar site South of Port Blair. This radar site was briefly intercepted on Mission No. 40 with similar characteristics logged as 100/730/12.

2. Penang Island:

a. There is conclusive evidence that two Mk 1 Model 1 radar sites are in operation in the Penang Area: 103/492/22; 102/463/16. These radar sites have been analyzed on previous missions. However, this is the first time that both radar sites have been intercepted in operation simultaneously.

b. There is a 77/493/50 "CHI" radar site located in the Penang Island Area. The similarity in characteristics with the Medan Radar (77/487/50) makes intercepts and rough D/F cuts difficult to analyze.

-1-

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3. Singapore Area:

a. The two Mk 1 Model 1 early warning radar sites previously D/F'ed to Singapore Island were again in operation and were logged as strong and steady while the search aircraft were circling at the IP. The Characteristics of the radar sites are as follows:

99.5/500/8.5  
106/515/15

b. Boelan Island: 101/374/52. Fair D/F cuts suggest a modified Mk 1 Model 1 to be located South of Singapore Island at approximately 103°55'E 1'N.

c. In accounting for 81% of the aircraft reporting accurate heavy anti-aircraft fire it would seem possible that radar was being used to provide fire control data however, no intercepts were made with radar fire control characteristics.

The following intercepts were made in the target area:

156/1857/5  
161/1860/5  
190/914/6.5  
196/500/11.5  
201/1030/6

4. Great Coco Island: The radar located on Great Coco Island was not intercepted.

5. Communication Intercepts: The Nisei radio operators made several intercepts in the 4 Mc. band but due to loss of power and severe interference no analysis of the enemy radio nets was made.

6. The Nisei radio observers were briefed to monitor possible radio signals associated with free balloons, however, no balloons were sighted nor were any odd signals logged in the 1-10 Mc. band.

C. Enemy Countermeasures

At approximately 0400Z, an aircraft in distress clamped the transmitter key down prior to the crew bailing out. The signal on the 8 Mc. channel was monitored from that time on and at first it appeared as though the aircraft was flying on automatic pilot without a crew. However, this theory was soon discarded

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as the known gas supply would have been expended. It is also the opinion of the communications section that the AN/ART-13 transmitter cannot normally be keyed continuously for longer than a twenty minute period without cutting off due to overheating. After 12½ hours the signal shifted 6 Kc. and was no longer monitored. D/F bearings made during this time established the signal as originating in the Rangoon Area and undoubtedly of enemy origin. It is not clear as to why the enemy would attempt such a radio countermeasure as other 8 Mc. nets were left untouched although it did force a bombardment group to change to an alternate frequency.

D. Equipment

No equipment malfunctions.

FOR THE DEPUTY COMMANDER:

*Leo I. Herman*

LEO I. HERMAN  
Colonel Air Corps  
Actg. Adjutant General

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

APR 64

E

CENTRAL SECTION WIRE CONTROL AND GUNNERY

\* \* \* \* \*  
\* Prepared by \*  
\* \* \* \* \*  
\* Staff Gunnery Officer \*  
\* \* \* \* \*  
\* XX Bomber Command \*  
\* \* \* \* \*

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HEADQUARTERS  
XX BOMBER COMMAND  
APO 493

CONSOLIDATED  
SPECIALIST MISSION REPORT  
OF STAFF GUNNERY OFFICER

Date Prepared: 6 March 1945

Field Order No. 41

Date of Mission: 2 March 1945

1. On the mission directed by Field Orders No. 41 against Singapore fighter opposition is considered weak. As on previous missions to this target area, enemy fighters were not aggressive. However, there was an increase in the number of phosphorous bombs dropped by enemy aircraft. On one four plane formation of B-29s, ten successive aerial bomb bursts were encountered from the high frontal area. These attacks were ineffective and no damage was reported from phosphorous bombs.

2. The mission is considered as satisfactory in regards to gunnery.

3. The following statistical data is submitted:

	<u>40th</u>	<u>444th</u>	<u>462nd</u>	<u>468th</u>
Ammunition used test firing	935	1705	350	1435
Ammunition used in combat	9040	720	5795	5715
Malfunctions of CFC equipment	0	1	1	0
Total turrets on mission	50	90	60	70
Malfunctions of cal. 50 MGS	0	0	1	2
Total cal. 50 MGS on mission	120	216	144	168
Total airplanes (included in report)	10	13	12	14
Total percent malfunctions	All Groups CFC Nil, Cal. 50 MGS Nil			

H-I-1

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ANNEX

I

CAMERAS AND PHOTOGRAPHS

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Authority **NND 760063**

By **VAN** NARA Date **12-8**

I - CAMERAS AND PHOTOGRAPHS

Mission No. 41

2 March 1945

	40th			444th			462nd*		438th			Total			
	K-18	K-20	K-22	K-18	K-20	K-22	K-17	K-18	K-18	K-20	K-22	K-17	K-18	K-20	K-22
Cameras airborne	2	10	6	6	5	6	5	1	4	9	8	5	13	24	20
No. in A/C failing to bomb any target	0	0	0	1	0	2	0	0	0	4	0	0	1	4	2
No. in A/C bombing targets	2	10	6	5	5	4	5	1	4	5	8	5	12	20	18
No. photographing targets	2	5	4-b	5	5	3	5	1	3-e-f	4	5	5	11-e-f	14	12-b
No. failing to photograph - mechanical	0	0	0	0	0	1-d	0	0	0	0	0	0	0	0	1-d
No. failing to photograph - other	0	5-a	2-c	0	0	0	0	0	0	1-g	3-h	0	0	6-a-g	5-c-h
No. usable negatives	8	45	9	38	0	13	22	6	26	24	167	22	78	69	189

\* Incomplete report.

- a. No photographs taken by 5 A/C. Cameras in A/C 555 jettisoned to lighten load.
- b. Including A/C 420 which photographed LRT with 2 usable negatives resulting.
- c. A/C 541 took no photographs due to violent evasive action necessitated by accurate flak. Camera in A/C 555 jettisoned.
- d. Malfunction in vacuum system.
- e. Including A/C 315 which bombed Primary Radar target and took photographs resulting in 13 usable K-18 and 4 usable K-20 negatives.
- f. A/C 469 ditched. Cameras missing.
- g. No photos taken by 1 A/C
- h. No photos taken by 1 A/C. A/C 678 missing.

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I-I-1

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ANNEX

J

AIRCRAFT LOSSES AND DAMAGE

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Authority **NND 760063**

By **VAN** NARA Date **12-8**

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I - AIRCRAFT LOSSES AND DAMAGE

Mission No. 41

2 March 1945

A. Aircraft Losses

1. Known Battle Losses:

a. Just before releasing bombs A/C #678 (468th) was hit by a burst of flak and forced to feather its number 4 engine. The formation split up just after bombs away and A/C #424 (468th) dropped back and escorted #678 for approximately 20 minutes. At about 0322Z A/C #424 left #678 to escort another aircraft in distress. At about 0331Z, 3 B-29's observed another B-29, presumed to be #678, in a shallow dive with its right wing on fire outboard of #4 engine. The aircraft lowered its nose wheel and 10 parachutes were observed leaving from the nose wheel door and rear hatch. Shortly afterward the right wing came off, the aircraft then disappeared into a low cloud about two miles off the western shore of the Malay peninsula. The crew members of one B-29 definitely saw the crippled B-29 crash in the water at about 0333Z at a position estimated to be 6 miles northwest of Cape Segenting (01°48'N - 102°54'E). The crew of one other aircraft which did not see the B-29 after the crew bailed out estimated the position of the crash to be about 9 miles southeast of Cape Segenting. All witnesses agreed that the aircraft crashed in the Straits of Malacca about 2 miles off the Malayan coast. None of the witnesses were close enough to the crash to identify the aircraft as #678 but since all other aircraft are accounted for it is assumed that it was the one crashing.

b. A/C #469 was hit by heavy antiaircraft over the primary target 1/2 minute before releasing bombs. Fragments of antiaircraft shells hit number one engine which could not be feathered, damaged the bomb release mechanism making it impossible to salvo bombs, knocked out the pressurization system, tore away number 2 and 3 engine throttle linkage, punctured a hole 1 1/2 feet in diameter in the horizontal stabilizer, punctured the bomb bay tanks, and knocked out the upper front turret, radio compass, drift meter, and engineer's carburetor heat gauges and cylinder temperature gauges as well as the pilot's manifold pressure indicators. After being hit #469 began to lose 1500 feet of altitude per minute and airspeed dropped to 170 miles per hour. The crew began to jettison equipment to lighten the aircraft and the bombs were toggled out with a screwdriver. Bomb bay tanks were salvoed but one tank hit the retracting screw on one of the doors making it impossible to close doors and eliminating the possibility of ditching the aircraft. When the aircraft was stripped it was down to 2000 feet altitude and 150 miles per hour indicated airspeed. The pilot decided to make for Auriol Island and abandon the aircraft there. Auriol Island was reached at 0800Z and the crew bailed out. Crew members landed in the water and were unable to reach the island in spite of life rafts which were dropped by a British Air/Sea Rescue Liberator which was over Auriol Island within 20 minutes after the bail out. All but one of the crew members were picked up the following day by a Catalina. The prompt and successful rescue of this crew was accomplished by means of the excellent cooperation of the pilot and Air/Sea Rescue units. As soon as the pilot had ascertained the correct condition of his aircraft and was sure that he would not be able to reach a friendly field, he decided on a definite plan of action, notified ground stations and A.S.R. agencies, and then followed his original plan to the letter,

J-I-1

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By VAN NARA Date 12-8



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enabling rescue units to establish a rendezvous within a few minutes after the aircraft was abandoned.

2. Known Operational Losses:

None.

3. Missing Aircraft:

None.

B. Aircraft Damage

For details of battle and operational damage by aircraft see Consolidated Mission Statistical Summary, Annex M, Table V.

J-I-2

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By VAN NARA Date 12-8

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

ANNEX

K

FUNCTIONING OF EQUIPMENT

- I - Functioning of Equipment
- II - Performance Data \*

\* Prepared by Staff Flight Engineer

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

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I - FUNCTIONING OF EQUIPMENT

Mission No. 41

2 March 1945

- |  |    |
|--|----|
| 1. A/C Airborne  | 64 |
| 2. Less A/C failing to bomb the primary target - mechanical                            | 10 |
| a. Bombed secondary target (2)   |    |
| (1) A/C 897 (444th) - smoking engine which was feathered                               |    |
| (2) A/C 468 (463th) - radar inoperative  |    |
| b. Bombed last resort target (1)   |    |
| (1) A/C 428 (444th) - excessive fuel consumption at<br>briefed power settings          |    |
| c. Jettisoned bombs (5)  |    |
| (1) A/C 337 (444th) - engine failure - bad spark plugs                                 |    |
| (2) A/C 446 (444th) - internal engine failure  |    |
| (3) A/C 728 (462nd) - feathered #4 engine - bad oil leak                               |    |
| (4) A/C 919 (462nd) - lost oil cooler valve in #1 engine<br>causing engine to overheat |    |
| (5) A/C 434 (463th) - broken oil line resulting in bad leak                            |    |
| d. Returned with bombs (2)   |    |
| (1) A/C 227 (463th) - bad oil leak due to broken oil line                              |    |
| (2) A/C 734 (463th) - nose oil line broken   |    |
| 3. Less A/C failing to bomb the primary target - other reasons                         | 5  |
| a. Bombed primary radar target (1)   |    |
| (1) A/C 315 (463th) - weather  |    |
| b. Bombed secondary target (1)   |    |
| (1) A/C 273 (444th) - missed formation at PT - personnel<br>error                      |    |
| c. Jettisoned bombs (3)  |    |
| (1) A/C 469 (463th) - enemy action. Hit by AA over primary<br>target                   |    |
| (2) A/C 502 (462nd) - excessive fuel consumption due bad<br>weather                    |    |
| (3) A/C 474 (462nd) - excessive fuel consumption due bad<br>weather                    |    |
| 4. A/C bombing the primary target  | 49 |

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By VAN NARA Date 12-8

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HEADQUARTERS  
XX BOMBER COMMAND  
APO 493

CONSOLIDATED  
SPECIAL MISSION REPORT OF  
STAFF FLIGHT ENGINEER

Date Prepared: 5 March 1945

Field Order No. 41  
Date of Mission: 2 Mar 45

1. A summary of the performance of the aircraft that bombed the primary target and returned to their own base is contained in the attached table.
2. Overall performance on this mission conformed with the past missions to this target.

- 1 -

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By VAN NARA Date 12-8

SUMMARY OF PERFORMANCE  
FIELD ORDER NO. 41  
PRIMARY TARGET

Group		Overall	40th	414th	462nd	468th
*No. of Aircraft		43	9	15	6	13
Total Time		17:09	17:26	17:43	17:17	16:17
Time to Target		8:38	8:35	3:49	8:55	8:20
Fuel Burned	Ave.	7180	7225	7315	7040	7175
	Max.	7650	7500	7350	7300	7500
	Min.	6775	7100	6950	6775	6950
Fuel Carried	Ave.	7900	7900	7900	7900	7900
	Max.	7900	7900	7900	7900	7900
	Min.	7900	7900	7900	7900	7900
Burnable Reserve	Ave.	720	675	385	860	725
	Max.	1125	825	650	1125	1000
	Min.	250	400	250	700	400
**Air Miles		3850	3954	3837	3831	3802
Ground Miles		3725	3710	3725	3761	3718
**Gal/Air Miles		1.86	1.82	1.88	1.34	1.88
***Bombing Altitude		20,800	21,300	21,000	21,500	20,000
Starting Gross Weight	Ave.	134,787	134,500	134,383	134,969	134,789
	Max.	135,500	134,842	135,500	135,269	135,270
	Min.	133,915	134,245	134,419	134,710	133,815
Weight of Bombs	Ave.	* 4330	4360	4360	4500	4200
	Max.	4900	4360	4330	4900	4360
	Min.	3815	4360	4360	4360	3815
No. of Bombs	M-64	7.9	8	8	8.2	7.7

\*Aircraft that bombed the primary target and returned to their own base.  
 \*\*Air miles are of questionable accuracy due to difficulties in determination.  
 \*\*\*Pressure Altitude.

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 Authority NND 760063  
 BY AN NARA DATE 12-8

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L

TARGET DAMAGE ASSESSMENT

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* * * * *
* Prepared by: *
* * * * *
* Target Intelligence Unit *
* * * * *
* XX Bomber Command *
* * * * *
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C O N F I D E N T I A L

HEADQUARTERS  
XX BOMBER COMMAND  
Intelligence Section  
APO 493

12 March 1945

DAMAGE ASSESSMENT REPORT NO. 47

TARGET: Naval Base Area, Singapore, Malaya. (01°28'N--103°51'E)

GENERAL STATEMENT:

This report relates to damage resulting from a daylight attack by 50 aircraft of XX Bomber Command on 2 March 1945, Mission No. 41. A total of 385 500 pound GP bombs were dropped (approximately 106.87 short tons). Bombing altitudes ranged from 19,000 feet to 24,500 feet, with aircraft over the target from 0222Z to 0320Z, encountering CAVU to 2/10 undercast weather. Assessment of damage was accomplished from poor quality photography, Mission 5MR40, obtained by the 462nd Bomb Group, XX Bomber Command, on 2 March 1945 and from strike photographs of variable quality.

This marks the fourth attack on the Naval Base Area. The first, directed at the Drydock and West Wall, took place on 5 November 1944, Mission No. 15; the second, directed at the Floating Drydock and West Wall, took place on 11 January 1945, Mission No. 27; the third, again directed at the Floating Drydock and West Wall, took place on 1 February 1945, Mission No. 33.

Previous attacks had effected damage to buildings amounting to 436,200 sq. ft. or 21.6% of the total area of buildings. Damage from this attack amounted to 235,100 sq. ft. or 11.6% of the total area of 2,020,300 sq. ft. of buildings. In this attack 216,400 sq. ft. sustained structural damage\* and 18,700 sq. ft. superficial damage\*.

Prior to this attack repairs to 109,500 sq. ft. of the damaged area had taken place. As a result of this attack, previous attacks and repairs, there are now 623,600 sq. ft. or 30.8% of the building areas still damaged. Of this total of damaged areas, 491,900 sq. ft. or 24.3% is structural damage and 131,700 sq. ft. or 6.5% is superficial damage.

The four large Transit Sheds and the three large Storehouses all received direct hits, resulting in extensive destruction and damage to three of the Transit Sheds and probable extensive interior damage to the fourth Transit Shed and three Storehouses. Severe structural damage was sustained by the Garage, Pilots House, Saw Mill, and Lumber Store, Riggers Shop, and miscellaneous small buildings and sheds. One near miss of 30 feet may have caused slight underwater damage to the 5,000 ton Floating Drydock. One large residential building south of No. 3 Storehouse was 50% damaged.

Repair is underway on building No. 82 (see Annex 1), the large workshop, thought to be the Gunshop. The steel frame has been repaired and it is 45% re-roofed. The Foundry, Boiler Shop, and seven smaller buildings have been repaired and the structural frame is apparently complete on building No. 94. Repair cleaning is just beginning on one roof bay of the Engineering Block, building No. 87. It is interesting to note that all repair activity is around the Graving Dock and among the buildings along the West Wall Area.

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

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

No activity is visible around the Admiralty Floating Dock IX. The condition of the dock and damaged vessel appears the same as reported in Damage Assessment Report No. 41, with the exception that the frame gate arms on the east end or bow are now open.

\* 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 Damage Assessment Report Nos. 19, 36, and 41.

WEIGHT OF ATTACK: 50 Aircraft  
385 M-43 and M-67 Amatol filled bombs (actual weight 543.9 pounds). Approximately 106.87 short tons.

PHOTOGRAPHY: (1) Strike Photos 5MB41, 2 March 1945, quality and scale variable.  
(2) XX Bomber Command Mission 5MR16, 5 February 1945, scale approximately 1:13,000, quality excellent (Pre-strike).  
(3) XX Bomber Command Mission 5MR40, 2 March 1945, scale approximately 1:13,000 (K-18) and 1:8,500 (K-22), quality poor (Post-strike).

ANNEXES: (1) Damage Plan.

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

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

-2-

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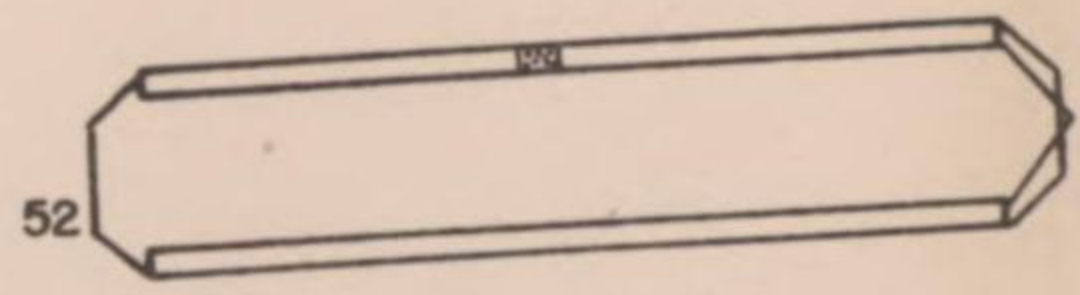
Authority **NND 760063**

By **VAN** NARA Date **12-8**



**LEGEND**

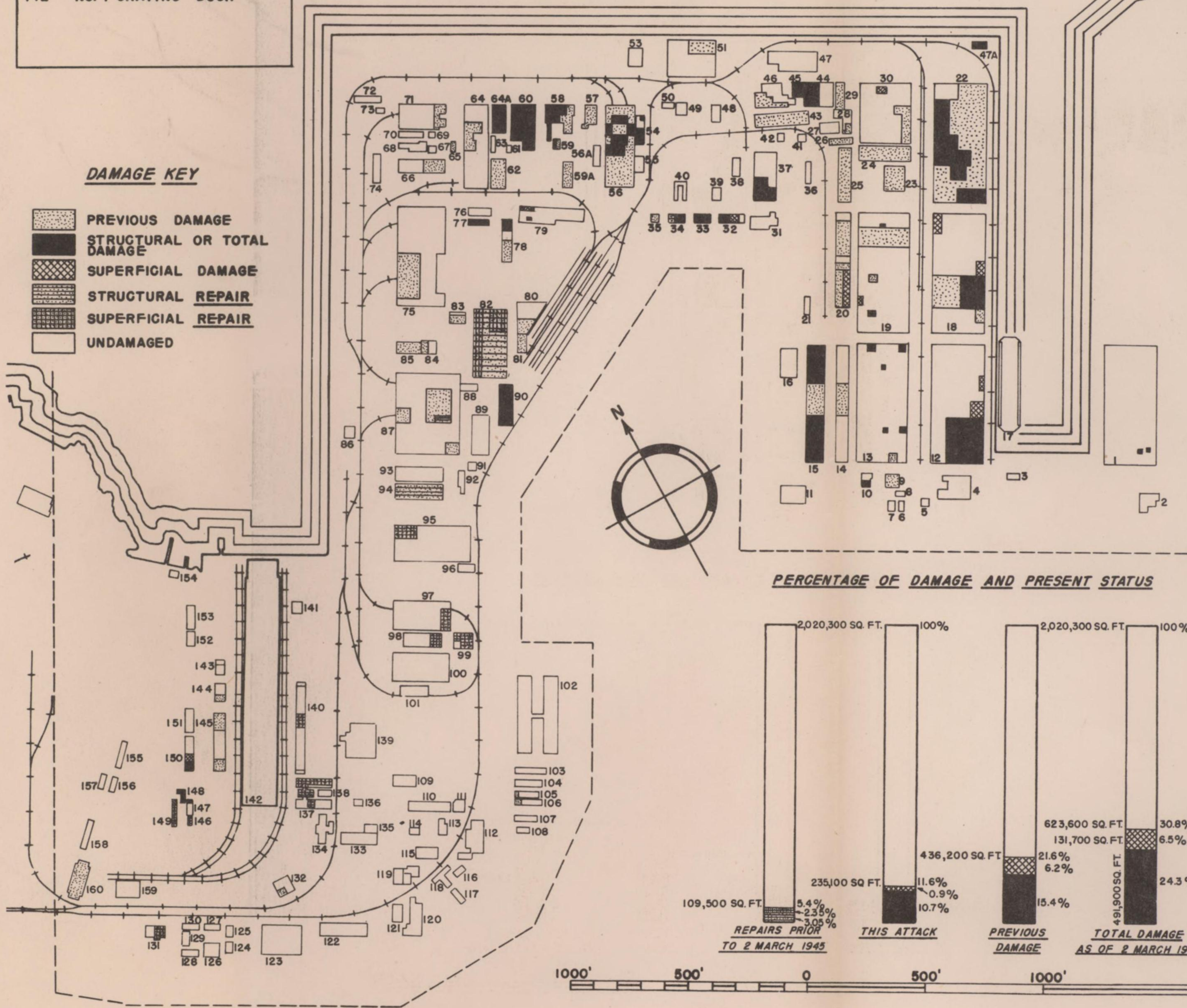
- 1 - NO.4 TRANSIT SHED
- 12 - NO.3 TRANSIT SHED
- 13 - NO.3 STOREHOUSE
- 17 - 5,000 TON FLOATING DOCK
- 18 - NO.2 TRANSIT SHED
- 19 - NO.2 STOREHOUSE
- 22 - NO.1 TRANSIT SHED
- 30 - NO.1 STOREHOUSE
- 37 - GARAGE
- 47A - PILOT'S HOUSE
- 52 - 50,000 TON ADMIRALTY FLOATING DOCK IX
- 56 - SAW MILLS AND LUMBER STORE
- 60 - RIGGERS SHOP
- 64A - ELECTRICAL EQUIPMENT STORE
- 82 - WORKSHOP (GUN SHOP)
- 87 - ENGINEERING BLOCK
- 95 - FOUNDRY
- 97 - BOILER SHOP
- 142 - NO. 1 GRAVING DOCK



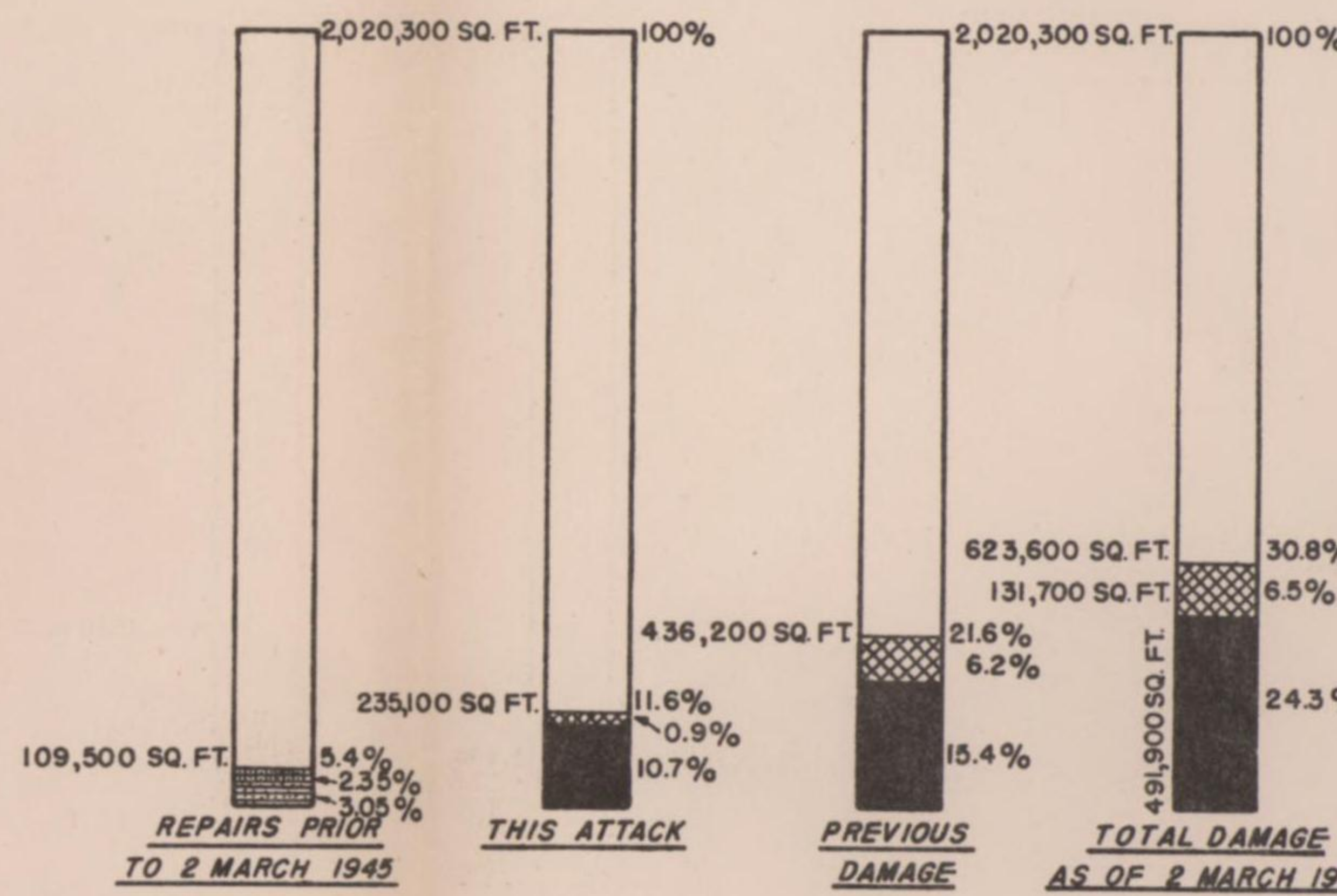
JOHORE STRAITS

**DAMAGE KEY**

- PREVIOUS DAMAGE
- STRUCTURAL OR TOTAL DAMAGE
- SUPERFICIAL DAMAGE
- STRUCTURAL REPAIR
- SUPERFICIAL REPAIR
- UNDAMAGED

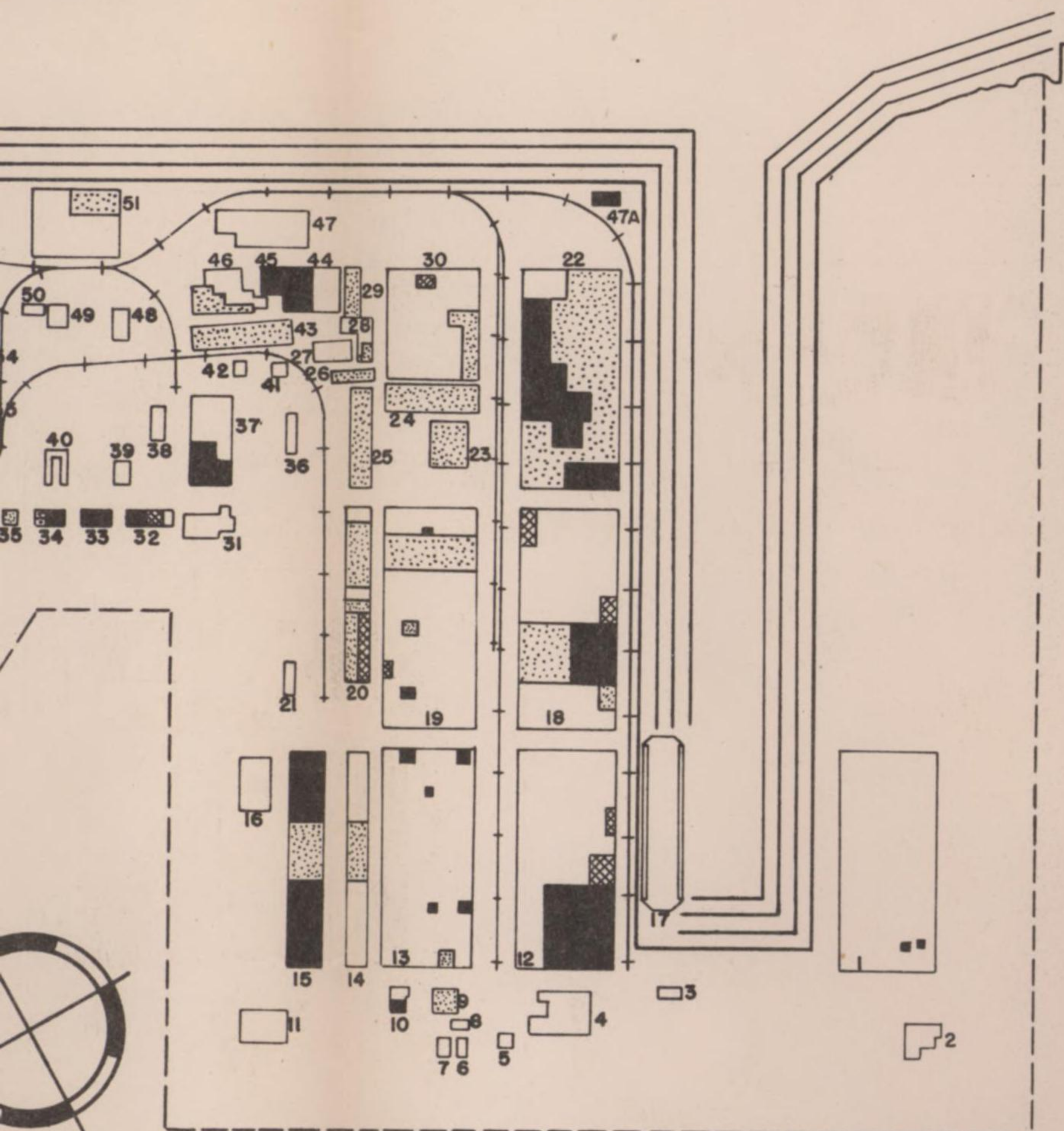


**PERCENTAGE OF DAMAGE AND PRESENT STATUS**

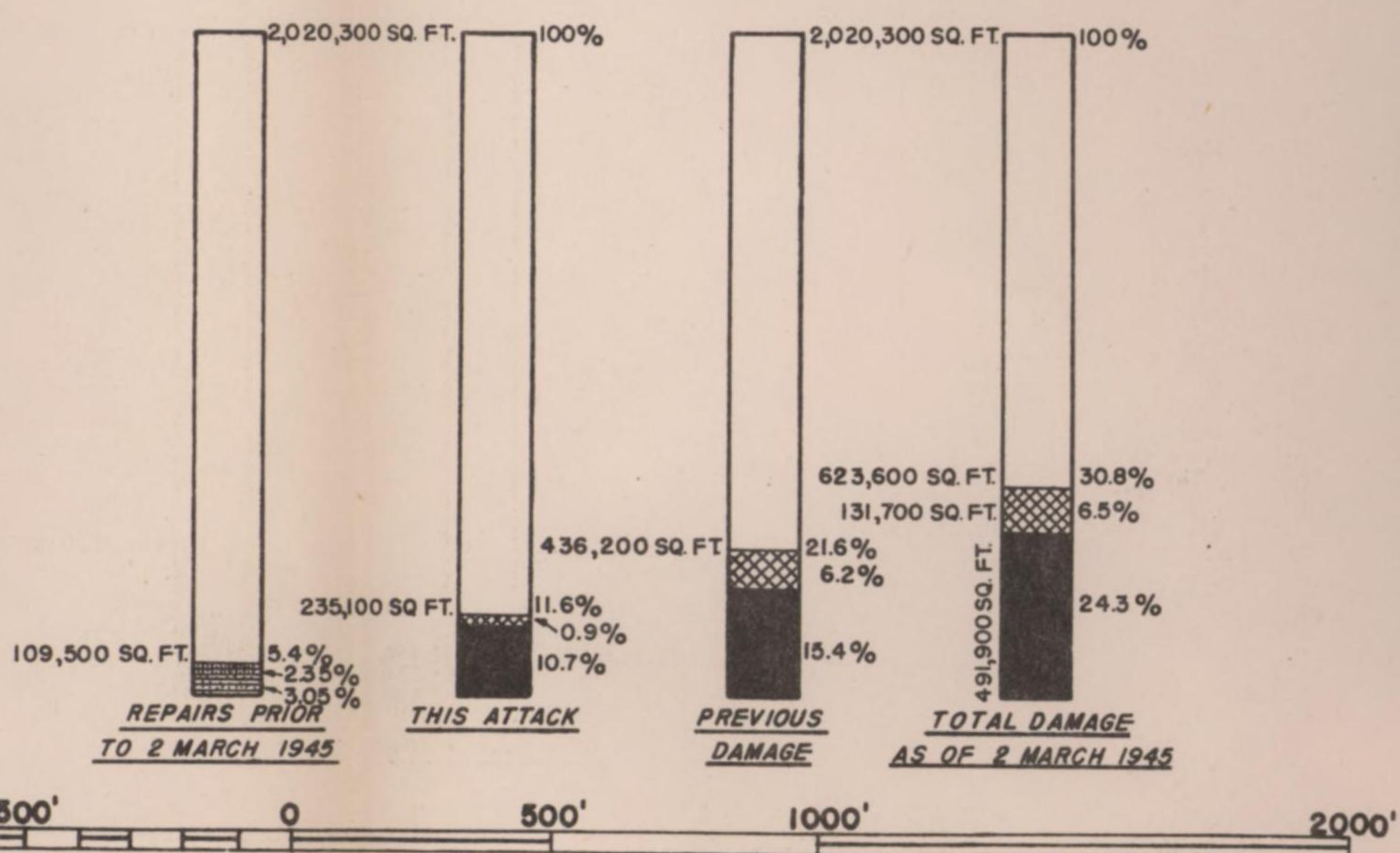


ANNEX I  
 D. A. REPORT NO. 47  
 SINGAPORE NAVAL BASE AREA  
 TARGET UNIT, XX B.C.  
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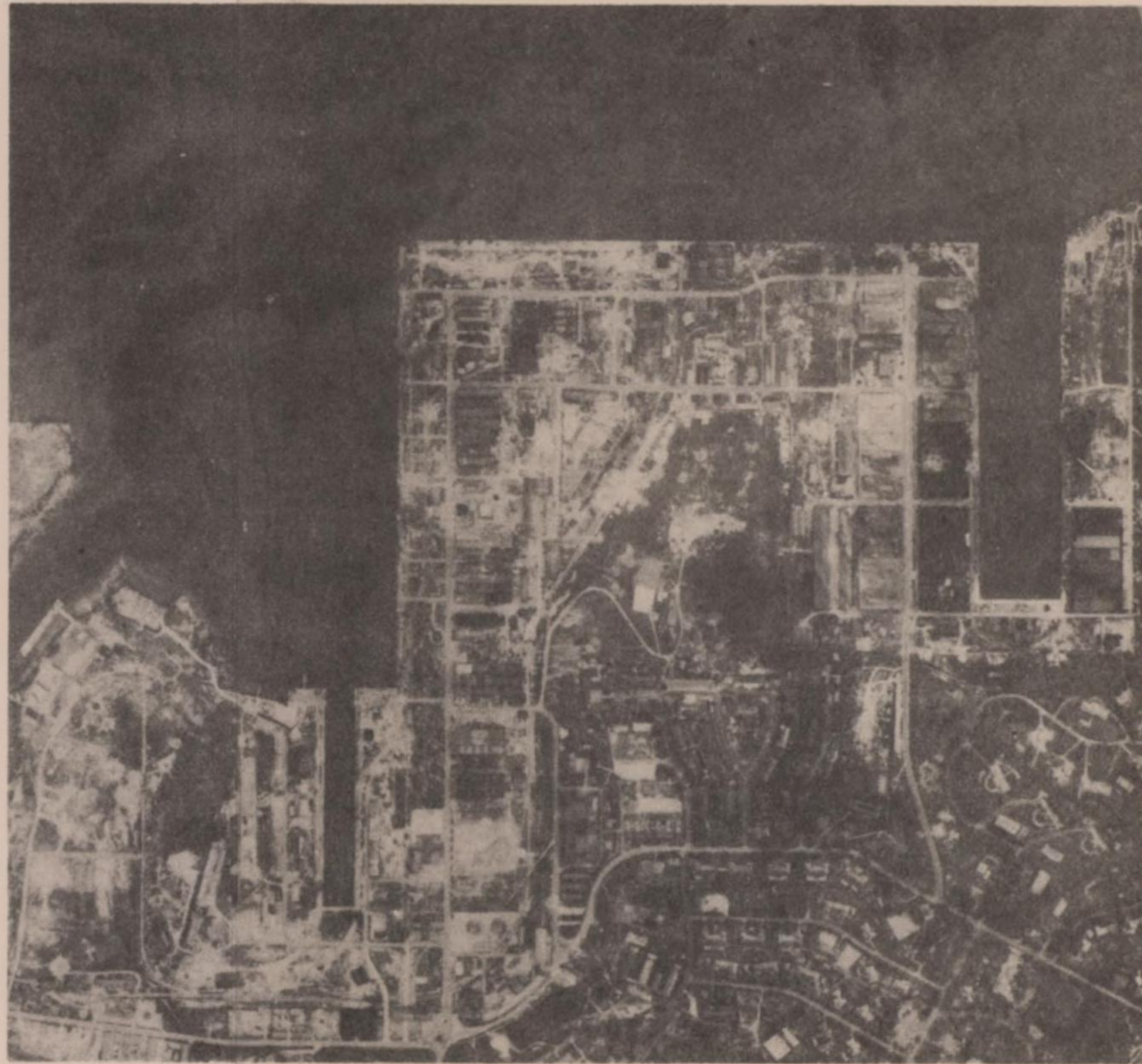
ORE STRAITS



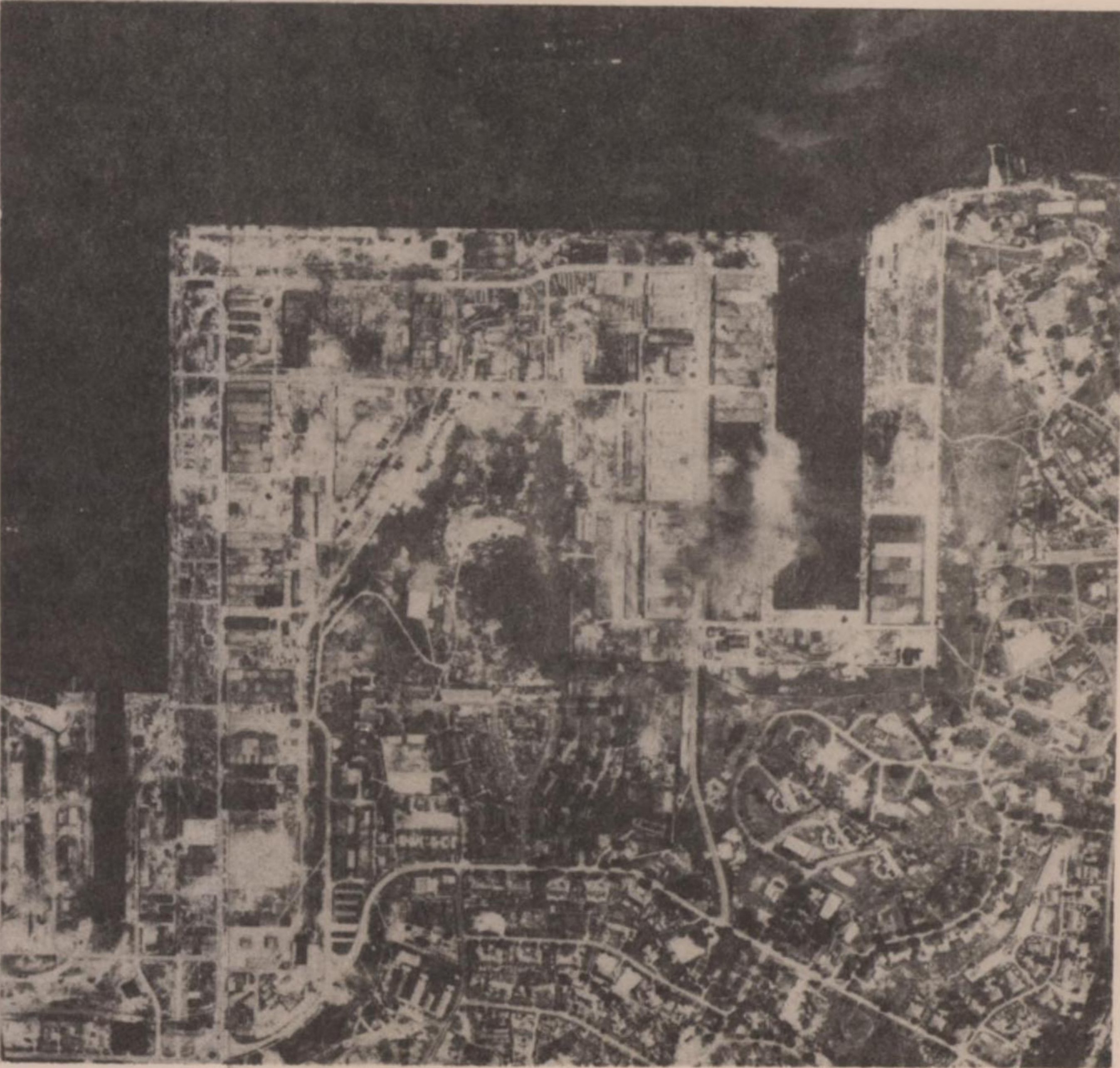
PERCENTAGE OF DAMAGE AND PRESENT STATUS



BEFORE



LAST FORMATION OVER



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ANNEX

M

CONSOLIDATED MISSION STATISTICAL SUMMARY

```
*****  
* Prepared by: *  
* Statistical Control Section *  
* XI Bomber Command *  
*****
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XX BOMBER COMMAND  
 CONSOLIDATED MISSION STATISTICAL SUMMARY  
 Mission Number Forty One  
 2 March 1945

**CONFIDENTIAL**  
 SECRET

By Authority of the  
 Commanding General:

3-19-45 ER  
 Date Initials

Table I and II - Aircraft Participating \*

Group	Mis- sion 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.	Enemy Action					Unknown
40th	41	41	12	1	8.3	1						1800Z	1153Z	17:19	16:32
444th	41	41	20	4	20.0	3	1					1755Z	1245Z	17:53	8:58
462nd	41	41	12	4	33.3	2		2				1801Z	1130Z	17:02	8:58
468th	41	41	20	5	25.0	4				1		1830Z	1138Z	16:24	8:46
TOTAL	41	41	64	14	21.9	10	1	2		1		1755Z	1245Z	17:13	9:29

\* Mission was run from Rear Area Bases; Table I and II consolidated because there was no Rear to Forward Area Movement.  
 \*\* Field Order #41 did not specify number of aircraft.  
 \*\*\* Excludes A/C which landed at other fields.

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XX BOMBER COMMAND  
 CONSOLIDATED MISSION STATISTICAL SUMMARY  
 Mission Number Forty One  
 2 March 1945

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By Authority of the  
 Commanding General:

3-14-45 SR  
 Date Initials

Table III - Bombing Runs

Group	No. of A/C Bombing	Target Bombed	Time of Release		Altitude of Release		Visual Bomb		Radar Bomb		Blind Bomb		On The Leader			A/C Dropping On			
			Earliest	Latest	Highest	Lowest	A/C Sight- ing For		A/C Sight- ing For		A/C Sight- ing For		Visual	Radar	Blind	AFCE	Manual		
							R&D	Range	R&D	Range	R&D	Range							
40th	11 1	Singapore (A) Khao Huagang	0222Z	0249Z	24500	19000	6						5			6	5		
			0429Z	0429Z	15000	15000	1												1
444th	16* 2	Singapore (A) Batu Arang	0249Z	0320Z	22300	19000	4						12			4	12		
			0225Z	0349Z	19000	12000	1		1										2
462nd	8	Singapore (A)	0245Z	0254Z	23000	19600	3						5			2	6		
468th	14 1 1	Singapore (A)	0240Z	0319Z	21300	20000	5						9			4	10		
		Singapore (B)	0241Z	0241Z	21000	21000			1									1	
		Batu Arang	0311Z	0311Z	23000	23000				1									1
TOTAL	49* 1 3 1	Singapore (A)	0222Z	0320Z	24500	19000	18						31			16	33		
		Singapore (B)	0241Z	0241Z	21000	21000			1									1	
		Batu Arang	0225Z	0349Z	23000	12000	1		1		1								2
		Khao Huagang	0429Z	0429Z	15000	15000	1												1

Primary Target - (A) Naval Base Area, Singapore (Visual); alternate primary (B) Bakun Island, Singapore Area (Radar).  
 Secondary Target - Malayan Collieries, Batu Arang, Malaya.  
 Last Resort Target - Main Hutted Area, Khao Huagang, Thailand.  
 \* Includes one A/C which dropped 5 bombs on P. T. and jettisoned 3 bombs.

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XX BOMBER COMMAND  
CONSOLIDATED MISSION STATISTICAL SUMMARY  
Mission Number Forty One  
2 March 1945

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3-14-45 SR  
Date Initials

Table IV - Bomb Loading & Disposal

Group	* Type of Bombs	Bomb Loading on A/C Airborne in R.A.		Average No. Loaded	Total Loaded	On Targets					Bomb Disposal		
		Fusing				Singapore A	Singapore B	Batu Arang	Khao Huagang	Oppor-tunity	Jettisoned	Returned	Unknown
Nose	Tail												
40th	500# GP	.1	.1	8.0	96	88			8				
444th	500# GP	.1	.1	8.0	159	125		16			18		
462nd	500# GP	.1	.1	8.2	98	62					36		
468th	500# GP	.1	.1	7.8	156	110	8	7			15	16	
TOTAL	500# GP	.1	.1	8.0	509	385	8	23	8		69	16	

\* 500# GP - AN-M 64 - Actual weight 543.9 pounds  
AN-M 43 - Actual weight 543.9 pounds

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XX BOMBER COMMAND  
CONSOLIDATED MISSION STATISTICAL SUMMARY  
Mission Number Forty One  
2 March 1945

Table V - Aircraft Lost and Damaged

		<u>Aircraft Lost</u>		
<u>Group</u>	<u>Serial Number</u>	<u>Combat</u>	<u>Operational</u>	<u>Explanation</u>
468th	24469	X		Hit by flak over Primary Target, engine feathered, bomb bay doors would not close low on fuel.
	24678	X		Hit by flak over Primary Target, feathered #4 engine.
TOTAL		2		

Aircraft Damaged

Major Damage

<u>Group</u>	<u>Serial Number</u>	<u>E/A</u>	<u>A/A</u>	<u>Own Guns</u>	<u>Other</u>	<u>Explanation</u>
40th	63555	X	X			#1,2, and 3 nacelles, #4 wing tank, forward and rear pressure compartments.
	65233		X			Left wing, right & left horizontal stabilizer, #2 nacelle, nose wheel door.
	24718		X			Structural damage to wings & fuselage, forced to feather #1 engine; #2 and 3 engines also hit.
444th	24732		X			Both wings and fuselage, fuel cell.
	24891		X			Bracing severed on #4 engine, collector ring and intake pipe torn off. Fire in induction system.
468th	63445		X			Both wings, fuselage, fuel cell.
	63534		X			Structural damage to wing, fuel cell punctured.
TOTAL		1	7			

Minor Damage

<u>Group</u>	<u>Serial Number</u>	<u>E/A</u>	<u>A/A</u>	<u>Own Guns</u>	<u>Other</u>	<u>Explanation</u>
40th	24795		X			Left wing, fuel cell.
	24541		X			Forward pressurized cabin, #1 and 3 nacelles, propeller blade.
	63455		X			Left wing, #1 nacelle, fuselage, #1 prop blade.

- 1 -  
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Table V - Aircraft Lost and Damaged  
Minor Damage - cont'd

Group	Serial Number	E/A	A/A	Own Guns	Other	Explanation
40th cont'd	63542		X	X		Left flap, left nose wheel door. Own guns hit bomb bay door.
	24846		X			Right wing tip, left horizontal stabilizer
444th	76327		X			Horizontal and vertical stabilizers.
	63557		X			Horizontal and vertical stabilizers.
	24462		X			Right wing and flap.
	24584		X			Left wing, #3 nacelle door, fuselage.
	63451		X			Left wing, fuselage.
	63496	X				Left wing, fuselage, cracked blister.
	65228		X			Left wing tip and turbo flight hood.
	24472		X			Right wing, horizontal stabilizers, cowl flap.
	24861		X			Right wing and flap.
	24731		X			Left wing and left horizontal stabilizer.
	24464		X			Skin on wings, fuselage and horizontal stabilizer.
	24538		X			Wings, fuel cell and right aileron.
	24485		X			Right flap, radar room, bomb bay door, fuselage, #1 nacelle.
462nd	69694		X			Wings and horizontal stabilizers, fuselage, #1,2, & 3 nacelles.
	65299		X			Wings and horizontal stabilizer.
	63540		X			#1 nacelle.
	24801		X			#4 prop blade, fuselage.
468th	65279		X			Right Aileron
	69665		X			Right wing, fuselage, #2 nacelle.
	24703		X			Radar dome, fuselage, left flap, #2 nacelle.
	24879		X			#2 nacelle, fuselage, left elevator.
	24691		X			Electric wires and hydraulic lines, #2 nacelle and landing gear.
TOTAL		1	26	1		

- 2 -

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XX BOMBER COMMAND  
 CONSOLIDATED MISSION STATISTICAL SUMMARY  
 Mission Number Forty One  
 2 March 1945

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 By Authority of the  
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 3-19-45 SR  
 Date Initials

Table VI - Attacks & Passes by Enemy Aircraft

DIRECTION	ALTITUDE															
	HIGH				LOW				LEVEL				TOTAL			
	40th	444th	462nd	468th	40th	444th	462nd	468th	40th	444th	462nd	468th	40th	444th	462nd	468th
0800	1												1			
0900	2		2									1	2	2	1	
1000	3		1										3	1		
1100	4	1	1	1	2				2				8	1	1	1
1200		2	3	2			1					3	2	4	5	
0100	1			3	1		1		2			1	4	1	4	
0200		1											1			
0300	4							1					4			1
0400	4												4			
0500																
0600				2					1			1	1			3
0700	1												1			
TOTAL	20	4	7	8	3		2	1	5			6	28	4	9	15

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XX BOMBER COMMAND  
 CONSOLIDATED MISSION STATISTICAL SUMMARY  
 Mission Number Forty One  
 2 March 1945

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 Date Initials

Table VII - Personnel Losses

Crew Position	Killed				Missing				Seriously Wounded				Slightly Wounded				Total Casualties				Total Participating			
	40	444	462	468	40	444	462	468	40	444	462	468	40	444	462	468	40	444	462	468	40	444	462	468
Pilot								1												1	14	20	12	20
Co-pilot								1					1				1			1	12	20	12	20
Navigator								1							1					2	12	20	12	20
Bombardier								1							1					2	12	20	12	20
Flight Engr								1												1	12	20	12	20
Radar								1							1					2	12	20	12	20
Radio								1					1		1		1			2	12	20	12	20
CFC Spec								1												1	12	20	12	20
Right Gnr								1								1				2	12	20	12	20
Left Gnr								2						1			1			2	12	20	12	20
Tail Gnr								1								1				2	12	20	12	20
R C M																								2
Others																					2	6	5	2
TOTAL								12					2	1		6	2	1		18	136	226	137	224

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XX BOMBER COMMAND  
 CONSOLIDATED MISSION STATISTICAL SUMMARY  
 Mission Number Forty One  
 2 March 1945

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 Commanding General:

3-19-45 SR  
 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 Rounds Expended in Combat		
	Upper Front	Lower Front	Upper Rear	Lower Rear	50 Cal. Tail		Destroyed	Probably Destroyed	Damaged	Destroyed	Probably Destroyed	Damaged
40th	347	119	205	126	107	9040	0	0	2	0	0	.22
444th	17	1	14	1	4	720	0	0	0	0	0	0
462nd	226	21	150	41	38	5815	0	0	1	0	0	.17
468th	90	26	53	53	65	5715	0	1	1	0	.17	.17
TOTAL	134	33	84	46	47	21290	0	1	4	0	.05	.19

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XX BOMBER COMMAND  
 CONSOLIDATED MISSION STATISTICAL SUMMARY  
 Mission Number Forty One  
 2 March 1945

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 By Authority of the  
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 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
40th	134449	7900	7231	7375	669	525
444th	134968	7900	7261	3918	639	3982
462nd	134893	7900	7040	4027	860	3873
468th	134697	7900	7147	4150	753	3750
TOTAL	134772	7900	7192	4289	708	3611

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