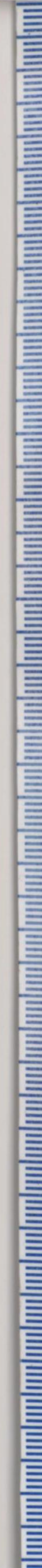


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XX Bomber Command



Tactical Mission Report

No. 33

DATE 1 FEBRUARY 1945

GENERAL OF THE ARMIES H.H. ARNOLD

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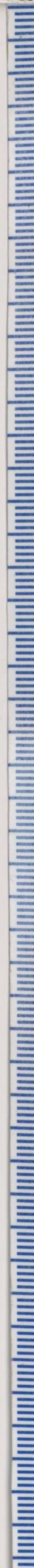
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TWENTIETH AIR FORCE
Office of the Deputy Commander, IB and C
APO 493

TACTICAL MISSION

REPORT

Field Order No. 33

Mission No. 33

TARGETS: Floating Drydock, Singapore
Drydock in the Naval Base Area, Singapore.

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- 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 C
APO 493

24 February 1945

SUBJECT: Report of Operations, 1 February 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 33 to participate in a daylight strike against drydock installations in the area of Singapore, Malaya. Groups, their locations and their Commanding Officers were as follows:

<u>Group</u>	<u>Base</u>	<u>Commanding Officer</u>
40th	Chakulia	Colonel W.H. Blanchard
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. 33.

b. Targets Specified:

- (1) Primary Target: Floating Drydock in the Naval Base Area, Singapore, Malaya (Objective Folder 92.2-22 and AAF Target Chart No. 92.2-17).
- (2) Alternate Primary Target: Drydock in the Naval Base Area (AAF Target 92.2-20).
- (3) Secondary Target: Swettenham and Victoria Piers, Georgetown, Penang (AAF Target No. 92.1-27).
- (4) Last Resort Target: Railroad Jetties and Yards, Martaban, Burma (XX Bomber Command Target 92.2-K).

3. STRATEGY AND PLAN OF OPERATIONS:

a. Importance of Targets:

- (1) Primary Target: This floating drydock, the second largest drydock unit at Singapore, can accommodate the largest battleship afloat. Although shorter than the Kings Drydock at the commercial harbor, its width gives it greater capacity in terms of tonnage. In conjunction with the Naval Base shops the drydock is equipped to accomplish any type of repairs.

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(2) Alternate Primary Target: The Drydock and West Wall Area includes the following: a large 1000-foot graving dock of concrete and steel construction; an adjustable sliding caisson housed in a small dock at right angles to the graving dock; water, air, electrical, and steam connections along side the graving dock; a railroad spur on either side, 2 50-ton traveling cranes on the dock walls; and the West Wall Docks with 2200 feet of berthing space, railroad spurs, and a 250-ton crane.

(3) Secondary Target: Penang is Malaya's second largest harbor and is currently an enemy submarine base. Numerous newly constructed warehouses of considerable size to the northwest of the target area suggest that Penang is also a storage and trans-shipment point for goods moving by coastal vessels between Malaya and Burma and by rail on the Singapore to Bangkok line.

(4) Last Resort Target: Ferries carrying goods and personnel ply between the jetties at Martaban and those at Moulmein, thus bridging the gap in the Burma - Thailand Railroad caused by the Salween and Gyaing Rivers. There is thus a railroad terminal at both towns for the reception of rolling stock and there are also warehouses for storing supplies awaiting trans-shipment. The rail yards at Martaban are currently extremely active, reflecting present events in Burma. On recent photo reconnaissance missions an average of over 100 cars have been observed at Martaban at any one time. Destruction of rolling stock and facilities at Martaban will complicate Japanese problems of supply and of retreat from Burma.

b. Details of Planning:

(1) Operational Planning:

(a) Cessation of tactical operations from China made available a large number of combat sorties from India bases. To make use of these sorties it was necessary to select suitable targets within operational range. The original plan for this mission was to attack the Naval Base installation at Singapore, this being the priority target from India bases. However, after several changes it was decided to attack the floating drydock since, it was felt, this was the most important target in the area.

(b) To carry out the foregoing, the floating drydock was made the primary target with the naval base area being the alternate primary target. The axis of attack was planned so as to bring the striking force over the naval base thereby permitting bombs to be dropped on this target if the floating drydock were not visible.

(c) The route for this mission was laid out on the eastern side of the Malaya Peninsula and was so planned to take advantage of existing weather.

(d) The decision to commit 112 aircraft on this strike was based on the fact that a previous large scale mission (number 27, 11 January 1945) had failed to destroy the primary target. Also it was felt that the naval base area itself, should it become the primary target, could very easily absorb the bomb damage which a striking force of this size could inflict.

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(e) As in mission number 32, it was decided to continue the system of dropping smoke grenades as a means of identifying formation leaders in order to properly determine the feasibility of the continued use of these grenades.

(f) For this mission airplane commanders were instructed to join the first lead crew at the assembly point regardless of organization. It was felt that by doing this, larger formations over the target would be possible.

(g) The secondary target, Georgetown, and the last resort target, Martaban, were selected because of their proximity to the return route and their importance to the logistical support of the Japanese effort in this area.

(2) Determination of Bomb Load:

(a) The field order prescribed that the 112 A/C to be airborne would be loaded with a minimum of four 1000-pound general purpose bombs fused .1 second nose and .025 second tail delay. Bombs were to be released electrically in minimum train on the range and deflection sighting of the formation leader.

(b) This great floating dry dock, reported to be the world's largest, was of riveted steel plate construction. Its dimensions are estimated at 855 feet by 172 feet. The estimated height of the sides above deck level is 55-60 feet. The main deck or floor of the dry dock appeared to be constructed of steel plate secured to a steel framework by means of rivets. The total thickness of the deck was calculated to be 15 inches, but the plate itself probably did not exceed 3/4 to 1 inch in thickness.

(c) When afloat, but unoccupied, the deck of the dry dock was roughly 12-15 feet above the surface of the surrounding water. The vertical distance from the top of the side walls to the surface of the water was approximately 60-65 feet. The distance from the deck or the floor to the underside of the dry dock is not known, but it is thought that it probably approached 30 feet. Consequently, the estimated overall height of the dry dock was 86 feet. Since the approximate depth of the channel in the vicinity of the dry dock is 39 feet at low tide, 45 feet at mean high tide, and 49 feet at mean high spring tide, it would not be possible completely to sink the dock below the surface of the surrounding water. If seriously damaged or virtually destroyed, the floating dry dock would submerge until it rested on the floor of the channel. In this event, depending upon the tide at the time of observation, it may be expected that from 35-47 feet of the upper sections of the side walls would project above the surface of the water. Similarly, if a large cargo vessel or a naval unit were under repair on the dock, a portion of its superstructure and perhaps the outline of the hull would be visible.

(d) The floating dry dock could be immobilized in any one or a combination of several ways. The buoyancy of the dock could be reduced to a point at which it would submerge by destroying the watertight bulkheads which form the buoyancy chambers. The pumping equipment could be rendered inoperable, or the power supply disrupted. The cranes mounted on the side wall of the dock could be torn from their beds. A ship under repair could be badly damaged or capsized in the dock, thus necessitating salvaging operations before repair to other ships could be undertaken.

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(e) When last photographed, subsequent to this Command's attack of 11 January 1945, the dock contained a 450-foot cargo vessel under repair, which may or may not have been there at the time of the attack. From a point of view of vulnerability to air attack, the floating dry dock would be most vulnerable when unoccupied but in an elevated position. However, with major units of the Japanese fleet awaiting the use of dry docking facilities, it was considered unlikely that the dry dock would be either submerged or unoccupied at the time of the attack. If occupied and in a raised position, the deck of the dock would be partially shielded by the ship under repair. This disadvantage could be largely outweighed, however, by the fact that the target would be more readily identifiable from altitude. From a vulnerability standpoint alone, it would be to our advantage if the dock were occupied by a cargo vessel instead of a major fleet unit.

(f) The axis of attack of 53 degrees magnetic facilitated target identification. It also resulted in an angle of attack of 56 degrees to the side walls, thus maximizing the likelihood of hits on the dry dock, since the trajectory of the bombs striking at an oblique angle approximately 20 degrees from the vertical would be interrupted by the side walls of the dock instead of ricocheting.

(g) In view of the tactical radius at which the aircraft were operating, Operations Analysis Section considered that the increased probability of hits with the bombs selected outweighed the advantage of using a larger bomb, particularly since numerous aircraft might find it possible to carry more than the minimum prescribed by the field order. It was estimated that three direct hits, fortunately placed, would achieve the desired result. Using these bombs, calculations indicated that the force expected to attack the target could reasonably be expected to obtain from three to five hits depending on how conditions at the target affected their bombing accuracy.

(h) The bomb fusing selected was .1 second nose and .025 seconds tail delay. With this fusing, if a direct hit were obtained on an unarmored or lightly armored vessel under repair in the dry dock, detonation would take place well within the hold of the vessel with the result that the ship might be capsized and the dry dock rendered temporarily inoperable. Similarly a direct hit on any portion of the dry dock would penetrate the floor of the dock and detonate within the buoyancy chambers, thus affecting the buoyant quality of the dock as well as the stability and balance of the ship under repair. While a certain amount of hydraulic ramming effect could be expected from near misses, their effect would be somewhat minimized inasmuch as the bombs would detonate in the silt several feet below the bottom of the dry dock.

(i) Theoretically, it is believed that a high altitude attack against this installation could best be executed by releasing bombs in train with a small intervalometer setting, using the AN-M230 hydrostatic tail fuze set for detonation at 25 feet below the surface and an M140 nose fuze set at .025 seconds delay. As in past operations the unavailability of the M-140 nose fuze precluded its use and the fusing employed was considered the closest approximation possible under field conditions.

(3) Bombing Data:

(a) As outlined in paragraph 3 b (1) (f), no minimum striking force was established by the Field Order; however, as indicated,

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airplane commanders were ordered to join the first lead crew sighted at the assembly point. No time over target was ordered but it was directed that arrival at the assembly point was to be at 0130Z. Bombing altitudes ordered were 19,000 feet for the 40th and 462nd groups and 20,000 feet for the 444th and 468th groups. Axis of attack was 53 degrees magnetic. If the primary target, the floating drydock, were not visible, the alternate primary target, the Naval drydock, could be attacked on the same heading. Initial point was the northeast tip of Karimonen Island (01°08'N - 103°23'E). Aiming point for the floating drydock was its center. For the alternate primary the center of the gate was to be the aiming point. No radar aiming point was given for the primary target as it was not to be attacked if not visible. The radar and visual aiming points for the alternate primary were the same.

(b) Both visual and radar aiming points for the secondary target were the corner of a specified warehouse. Center of the rolling stock in the railroad yards at Martaban was to be both the visual and radar aiming points for this last resort target.

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 be at the assembly point at 0130Z.

(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	28	1707Z	1752Z
444th	28	1723Z	1809Z
462nd	28	1730Z	1810Z
468th	<u>28*</u>	<u>1740Z</u>	<u>1829Z</u>
Total	112*	1707Z	1829Z

* Plus one aircraft which took off late at 1845Z.

(3) Visibility at bases at take-off was 7 to 10 miles. Winds southeast from 6 to 10 miles per hour.

b. Route Out:

(1) The route to the target was from base directly to the assembly point at Roepet Island (02°07'N - 101°39'E) to Great Karimonen Island (01°08'N - 103°23'E) to the target.

(2) Deviations from the briefed route were made by 38 aircraft, 23 on the route out. Fourteen bombed the secondary target, 5 the last resort target, 1 a target of opportunity, 2 jettisoned and 1 returned with bombs.

c. Primary Target:

(1) There were 88 aircraft over the Singapore drydock, of which 67 bombed the primary target and 21 bombed the alternate primary. Tons dropped on the primary target totaled 143.66, on the alternate primary, 47.89.

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(2) Eleven formations ranging in size from 3 to 18 planes bombed the Singapore drydocks. The seventh formation over attacked on an axis of 245 degrees. Other formations attacked on axes varying from 36 to 60 degrees.

(3) Lead aircraft of 5 formations bombed from 19,000 feet, 3 from 20,000 feet, and 1 each from 19,950 feet, 21,300 feet and 21,400 feet. Planes were over the Singapore area from 0209Z to 0322Z.

d. Secondary Target:

(1) Fifteen aircraft bombed the secondary target singly at altitudes from 15,000 to 21,300 feet between 0024Z and 0359Z. Sixty-three bombs totaling 64,206 pounds or 32.10 short tons were dropped on the target. Axes of attack varied from 13 to 355 degrees magnetic.

(2) Results of bombing observed were as follows: 40th Group - "fair to good with bombs hitting in the general target area"; 444th Group - "Hits seen in the northernmost row of warehouses in target area with large fires and much dense black smoke observed"; 462nd Group - one aircraft's bombs observed to hit on and around aiming point while another's fell about 300 feet short of the aiming point, all hitting in the warehouse area, however; 468th Group - unobserved to excellent with grey-black smoke funnelling upward from the target area.

e. Last Resort Target:

(1) Five aircraft attacked the last resort target singly between 2222Z and 0042Z. Headings of attacks varied from 20 degrees true to 90 degrees magnetic. Altitudes of attack were from 10,000 to 19,000 feet. Attacking aircraft dropped a total of 21 bombs - 21390 pounds or 10.69 short tons.

(2) Results of bombing by groups that attacked were as follows: 40th Group - of the three planes which bombed this target, two are believed to have put bombs in the target area causing some damage and one is thought to have dropped short with bombs landing in the water; 444th Group - unobserved; 462nd Group - bombs fell on tracks of main railway line.

f. Target of Opportunity: One aircraft of the 468th Group bombed a warehouse also at Bassien, Burma (16°18'N - 94°44'E) from 10,600 feet on a heading of 18 degrees magnetic at 0445Z. Bombing was by visual means. Bombs were observed hitting in the river to the east of the target.

g. Route Back:

(1) Briefed return route was direct from Singapore to base.

(2) Returning to base, 15 aircraft deviated from the planned route. Nine landed at Cox's Bazaar, India, 4 landed at Chittagong, India, 1 bombed the secondary target, and 1 was last seen in the target area heading for a place to ditch in accordance with air-sea rescue arrangements.

5. ENEMY ANTI-AIRCRAFT:

a. Moderate and inaccurate to accurate heavy anti-aircraft fire was encountered by all aircraft attacking the Primary target area between

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0209Z and 0322Z. Three to 30 bursts were observed at any one instant and from 12 to approximately 250 were reported for any one encounter. While types of fire employed by shore based or ship borne guns could not be distinguished it is known that continuously pointed, predicted concentration, and possibly barrage types of fire were encountered.

b. At the secondary target 4 of the 16 aircraft attacking encountered meager and generally inaccurate antiaircraft fire from 0023Z to 0316Z at altitudes between 15,000 and 21,000 feet. Two aircraft reported what was believed to be continuously pointed fire.

c. Of the 5 aircraft bombing the last resort target only 1 encountered antiaircraft fire and this was meager and inaccurate. It is believed that the fire-encountered at 0016Z at 17,000 feet-was predicted concentration. A total of 16 bursts were counted below and trailing.

d. Meager and inaccurate heavy antiaircraft fire was also encountered at the following locations outside the assigned target areas: Cape Piai (01°16'N - 103°31'E); Roepat Island (02°07'N - 101°39'E); Bekok Island (02°20'N - 103°05'E); Ship-borne (04°32'N - 100°10'E); Ship-borne (03°40'N - 100°23'E); and Andaman Islands (13°20'N - 92°50'E).

e. Nachi and Atago class cruisers and an unidentified type of destroyer present in the Johore Straits contributed to the antiaircraft fire encountered at the primary target.

f. A number of unusual types of bursts resulting from antiaircraft fire were reported. Purple, red, yellow and brown bursts were sighted in addition to black, white and phosphorous. The possibility exists that variations in the development of these bursts is responsible for the multi-colored sightings. Another possibility is that various colors were employed in order that batteries firing might identify their own bursts - a condition reported by United States Naval aircraft attacking Japanese naval units in the Pacific. Bursts noticeably tear-drop in shape and larger in diameter than other bursts were reported coming from cruiser-based antiaircraft fire. Also observed were "large flaming bursts" approximately 3 times the size of ordinary bursts, black smoke followed by a sheet of flame, a very large "plume of white smoke", and one burst "which spun in a circle on a vertical plane."

g. A possible high altitude balloon was sighted by one aircraft at 0035Z over the northwest side of Penang Island (05°25'N - 100°21'E) at about 10,000 feet. Balloon was reported to be silver and tear-drop in shape.

h. During the period of attack a maximum of 12 smoke generators were employed, ineffectively, to provide a smokescreen for the primary target.

i. Just prior to bomb release, antiaircraft fire increased in intensity for all formations. Heavy antiaircraft fire was encountered on an average from 2.3 minutes before to 1.7 minutes after bombs away.

j. Lone enemy aircraft were reported by 4 formations as flying parallel courses at the same altitude. The accuracy of heavy antiaircraft improved at this time, indicating the possibility that these aircraft were reporting speed, altitude and course in formation to ground installations.

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k. Meager, inaccurate automatic weapons fire 5,000 to 10,000 feet below the formations was also reported at Singapore.

l. There is a possibility (but no definite indication) of the use of gun-laying radar through R.C.M. intercepts.

m. Two unusual occurrences took place on this mission which give rise to the thought that the Japanese are employing two new types of automatic weapons. They are:

(1) A possible smoke signal in the form of a zig-zag trail of smoke. Such a phenomena was reported rising from the vicinity of the mouth of the Perak River ($04^{\circ}00'N - 100^{\circ}50'E$). Altitude at the time the observation was made was 16,000 feet, time 0128Z. Undercast was 5/10. No explosion was seen.

(2) A possible smokeless and fragmentless antiaircraft projectile was reported by two aircraft in one formation. The characteristics of this phenomenon were: strong concussion, no fragment damage, blinding flash with red center, fraction of a second duration, no smoke. The pilot of one aircraft reported an explosion with a blinding flash and no smoke, occurring on top the left horizontal stabilizer of his aircraft. No damage could be noted in flight nor was any found on inspection after landing. On another aircraft in this formation, a side gunner's blister was blown inward by a similar explosion. No fragment damage was sustained by the aircraft. The gunner was not injured except from the sudden contact with the blister and hitting the gunsight after being sucked outward as a result of the sudden depressurization.

6. ENEMY AIR OPPOSITION (See Annex C):

a. Air opposition was rated weak. With 56 of 109 B-29's sustaining 87 single and 15 coordinated attacks, resulting in 121 individual encounters. Japanese pilots displayed a fair amount of flying skill in the execution of their attacks but were not as aggressive as enemy pilots in other areas. Notably Manchuria and Kyushu. The enemy intercepting force was estimated as 65 fighter aircraft. Due to enemy fighter action, 1 B-29 (presumed to have ditched near the primary target) was lost, 2 B-29's received major damage and 5 suffered minor damage. Preliminary claims against enemy aircraft were 3 Destroyed, 4 Probably Destroyed, and 14 Damaged.

b. The majority of encounters (39 percent) originated from the frontal quarter, and the next highest number (33 percent) came from the left side. A distinct change from former tactics where encounters from the right side usually ran second to those from the front. This shift is difficult to explain particularly as examination showed that many of the attacks were executed into the sun. As for levels of approach, 71 per cent were high (an unusually large percentage) 17 per cent were level, and 12 per cent were low. The unusually large percentage of high approaches is not surprising, considering the bombing altitudes, and the indications of R.C.M. that the Japanese had sufficient warning of the approach of the B-29's to have their fighters airborne and waiting over the primary target area.

c. There were 36 aerial bombing attacks, mostly with phosphorous-type bombs, and all were ineffective. Of 15 coordinated attacks reported, 13 were made by 2 plane elements, 1 by an element of 3 and the remaining attack by five enemy fighters. There were no outstanding new or unusual enemy tactics.

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d. There were no reports of enemy attempts to ram, nor of any instances of near collisions. No rocket attacks were reported.

e. One Tojo was reported with off-set wing guns, and a possible new-type Japanese fighter was reported. The latter had a thick, round, tapered fuselage, retractable landing gear, radial engine and severely swept-back wings.

7. WEATHER (See Annex D):

a. The weather was suitable for formation flying and for precision bombing. A weak frontal passage in the base area on return caused cross winds with velocities up to 20 miles per hour and some gusts to 25 miles per hour. However, conditions remained "contact" at all times.

b. The metro winds were generally rated as fair to good.

8. COMMUNICATIONS (See Annex E):

a. Frequencies were in use for approximately 18 hours. During this time reception was good except for a period between 0030Z and 0500Z when participating aircraft were passing through local weather disturbances which caused an increase in static. Heavy interference was encountered by one aircraft from station LDO, Colombo, Ceylon, but an urgent radiogram to the Theater Signal Officer resulted in the channel being cleared.

b. Position reports of aircraft returning accounted for 97 per cent of the aircraft for which messages could be expected. Due to more than one aircraft in a formation reporting bombs away, more aircraft were reported in the bombs away messages than were actually airborne.

c. Violations recorded included one of transmission security, one of cryptographic security, and one of XX Bomber Command Tactical Doctrine.

d. Seventy-eight aircraft used 9 different radio beacons as navigational aids. The most frequently used was Piardoba (24) on initial contact of which was reported at 630 miles. Only one group reported aircraft using Direction Finding facilities, probably due to good terminal weather conditions. Two groups employed air-to-air homing. One aircraft accomplished a rendezvous after homing on a signal from 100 miles.

9. RADAR (See Annex F):

a. Radar bombsight procedure was used by most formations because of the partial undercast. All releases, however, were visual. Thus this procedure was implemental in obtaining the results achieved. Radar aided greatly in identifying the aiming point and the initial point.

b. Scope photography was excellent. More cameras were installed and more good quality pictures obtained than on any previous mission.

c. Serviceability of the radar sets was very good. Ninety-five per cent of the A.F.C. 13 sets were operative over the target.

10. RCM (See Annex G):

a. Eleven RCM search aircraft, each equipped with a bottom-mount D/F antenna participated in this mission. RCM observers searched for early warning radar to and from the target and for radar fire

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control equipment in the target area.

b. Early warning radar sets were identified at Great Coco Island; Port Blair, Andaman Islands; Penang; Medan area, Sumatra; Singapore. One radar site was reported near Port Dickson (02°30'N - 101°50'E) and two other sites were reported but are listed as "suspect" pending further verification.

c. Twelve possible radar fire control intercepts were made in the target area plus two others classified as "suspect".

d. No enemy countermeasures were reported.

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

a. The mission is considered satisfactory as regards functioning of Central Station Fire Control Equipment.

b. Nine turret malfunctions occurred in the 535 turrets airborne - 1.6 per cent. Of the 1264 machine guns airborne, there were 10 malfunctions, a performance failure of less than 1 per cent.

c. Rounds of ammunition fired in combat totaled 45,130, in test firing, 9,480.

12. CAMERAS AND PHOTOGRAPHS (See Annex I): Airborne aircraft carried 8 K-17, 20 K-18, 34 K-20, and 32 K-22 cameras on this mission. A total of 94 cameras of all types were airborne of which 64 photographed targets obtaining 424 usable negatives.

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

a. Known Battle Losses and Damage: Two aircraft were classed as battle losses on this mission. One aircraft of the 40th Group was known to have been hit by fighters just after bombs away and was last seen heading for a friendly rescue craft to ditch. No further word has been received on this plane. In addition, one aircraft of the 444th Group crashed on landing as a result of damage inflicted by flak. It was dropped to survey on D-day plus two. Fifteen aircraft suffered battle damage. Of these 3 had major damage and 12 minor damage. Two of the aircraft suffering major damage were damaged by fighters. One other was damaged by flak in addition to the one surveyed. Five suffered minor damage from fighter attacks and 7 by antiaircraft.

b. Known Operational Losses and Damage: No operational losses were sustained on this mission. One plane was holed by a falling shell case and another was damaged when bomb bay doors were not fully opened at the time bombs were released.

c. Missing Aircraft: None.

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

a. Sixteen aircraft failed to bomb the primary target because of mechanical reasons. Power plant and accessories (4), fuel system (5), and electrical system (4) accounted for 13 aircraft. Propellor governor, instrument, and nacelle door failure were each responsible for one aircraft failing to hit the primary target.

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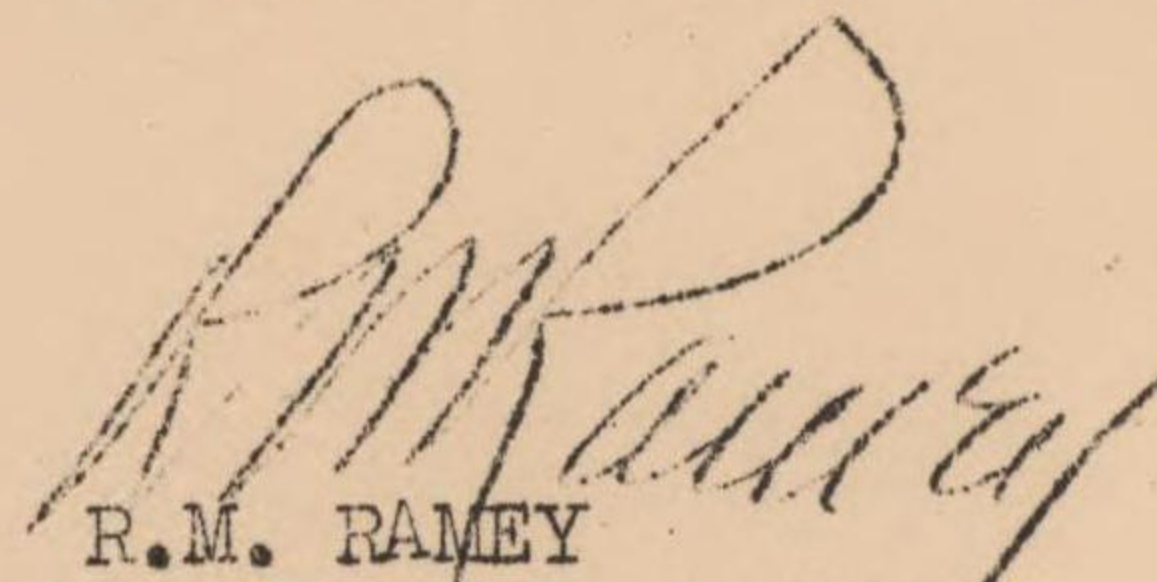
b. Malfunctions occurring which did not result in failure to bomb the primary target amounted to 123 divided as follows: Power plant and accessory section - 16 (Engine running rough - 8); propellers and governors - 8 (governor - 7); oil system - 7 (oil pressure low - 4); fuel system - 11 (fuel transfer system - 6); electrical system - 26 (generators - 11); instruments - 46 (cylinder head temperature gauge - 9); miscellaneous - 9 (pressurization - 6).

c. Over-all averages of fuel consumption for the flight were as follows: average - 7195 gallons; maximum - 7625 gallons; minimum - 6750 gallons. Statistics by groups were: 40th average - 7270 (maximum 7500, minimum - 7000); 444th average - 7160 (maximum 7400, minimum - 6930); 462nd average - 7240 (maximum - 7625, minimum - 7000); 468th average - 7110 (maximum - 7300, minimum 6750). The flight averaged 3820 air miles or 3762 ground miles.

15. TARGET DAMAGE ASSESSMENT (See Annex L):

a. Damage to Floating Drydock: Immediately prior to the attack, the floating drydock was partially submerged and the 460-foot engines-aft cargo vessel therein had steam up and was slightly askew, apparently getting ready to depart. In the course of the attack, the dock received 5 hits between the bulkheads, probably seriously damaging the bottom of the dock and setting the cargo vessel afire. In addition, 1 hit was scored on the top of the port bulkhead amidships, resulting in a 15 by 30 foot hole. Five near misses were close enough to have caused underwater damage to plates. Reconnaissance several hours after the attack showed the dock to be under water for approximately three-quarters of its length and the vessel aboard burning furiously in two places; that 4 days after the strike showed the dock to be on even keel but low in the water. As a result of at least 1 direct hit, the cargo vessel was sunk in the dock and was seen with decks awash. In view of the fact that the dock is probably 75 feet or more from top to keel and the deepest part of the straits is no deeper than 70 feet, the dock would not completely disappear from view. All indications are that the dock is resting on the bottom and is out of commission.

b. Damage to West Wall Area: Previous attacks had caused damage to buildings amounting to 97,700 square feet (4.8 per cent). This attack produced damage to an additional 338,500 square feet (16.8 per cent), making a total of 436,200 square feet (21.6 per cent) damaged. Of this total, 15.4 per cent is structural and 6.2 per cent is superficial. Severe structural damage had been sustained by No. 1 transit shed in a previous attack. On this attack, severe structural damage resulted to storehouses Nos. 1 and 2, transit sheds Nos. 2 and 3, the boat house, the saw mill and lumber store, the electrical workshop, the air compressor house, the No. 1 generating station, the gun shop, and the construction and engineering blocks. In addition, numerous smaller buildings sustained damage. Railroad and traveling crane shacks show 12 bomb hits. Two bombs falling just west of the No. 1 drydock appear to have chipped off approximately 100 feet of the edge of the dock and to have damaged a traveling crane track. Damage to the dock did not impair operating efficiency. Two bombs fell in the trackage of the Plate and Shape Storage Area east of the Gun Shop, damaging at least 6 rolling stock and several tracks.


R.M. RAMEY

Brigadier General, U.S.A.
Deputy Commander.

- 11 -

SECRET

S E C R E T

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

S E C R E T

S E C R E T

I - TAKE-OFF INFORMATION

Mission No. 33

1 February 1945

Group	First A/C Off	Last A/C Off	Elapsed Time	No. of A/C Taking Off	Average Take-Off Interval
40th	311707Z	311752Z	45 min.	28	100 sec.
444th	311723Z	311809Z	46 min.	28	102 sec.
462nd	311730Z	311810Z	40 min.	28	89 sec.
468th	311740Z	311829Z	49 min.	28-a	110 sec.
Overall	311707Z	311829Z	82 min.	112	---

a. Plus A/C #456 which took off late at 1845Z.

Note: Take-offs were on D-day minus one.

II - DETAILS OF ROUTES

Mission No. 33

1 February 1945

A. Planned Routes

	40th Chakulia	444th Dudhkundi	462nd Piardoba	468th Kharagpur
Base				
Assembly Point	Roepat Island (02°07'N - 101°39'E)			
Initial Point	Great Karimoonn Island (01°08'N - 105°23'E)			
Target	Floating Drydock, Singapore Naval Base Area			
Base	Chakulia	Dudhkundi	Piardoba	Kharagpur

B. Deviations from Planned Routes

1. A/C Bombing Assigned Targets:

	40th	444th	462nd	468th	Total
Secondary Target	2	5	2	6	15
Last Resort Target	3	1	1*	0	5
Total	5	6	3	6	20

A-I -1

A-II-1

S E C R E T

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- * A/C #800 (462nd) flew to Furian Point (15°50'N - 94°20'E), to Little Cocos Island (14°00'N - 93°14'E), to Preparis Island (14°57'N - 93°35'E) where it circled for 19 minutes until daylight. After bombing the last resort target, this aircraft returned again to Furian Point and from there flew directly to base.
2. A/C Bombing Targets of Opportunity: A/C #456 (468th) flew the briefed route as far as 04°36'N - 99°30'E where, because of turbo trouble with #2 and #4 engines, it turned from the attack and bombed a target of opportunity at Bassein, Burma (16°18'N - 94°44'E) and returning then to base.
3. A/C Jettisoned Bombs:
- A/C #580 (444th) jettisoned bombs and turned back at 13°32'N - 94°24'E after developing fuel transfer trouble. Return was direct to base.
 - A/C #232 (462nd) had a failure of its electrical system 15 minutes after take-off, jettisoned its bombs, and returned to base.
 - A/C #275 (468th) suffered a direct flak hit while over the primary target. Bombs were jettisoned 11 minutes after leaving the target area. Aircraft then flew to 03°57'N - 102°18'E thence to 05°43'N - 100°52'E and from there to Cox's Bazaar where it landed.
4. A/C Returning With Bombs: A/C #587 (40th) developed fuel transfer trouble shortly after take-off and was forced to turn back at 14°30'N - 92°40'E, returning directly to base.
5. A/C Landing at Other than Home Base:
- Chittagong:
 - A/C #396 (40th) landed at 0936Z due to lack of fuel. After refueling aircraft took off and returned to base at 1237Z.
 - A/C #407 (40th) landed at 1020Z short of fuel, refueled and returned to base at 1320Z.
 - A/C #718 (40th) landed at 1100Z short of fuel, refueled and returned to base at 1353Z.
 - A/C #488 (462nd) landed due to lack of fuel. Subsequent to landing an engine change was required. Aircraft is still at Chittagong at the time of this report. Landing time at Chittagong not known.
 - Cox's Bazaar:
 - A/C #559 (444th) landed at 0956Z short of fuel. After refueling aircraft returned to base landing at 1816Z.
 - A/C #584 (444th) landed at 1105Z low on gas. After refueling, aircraft returned to base, landing at 1416Z.
 - A/C #786 (462nd) landed at 0943Z because of fuel shortage. After refueling, aircraft returned to base, landing at 1845Z.

A-II-2

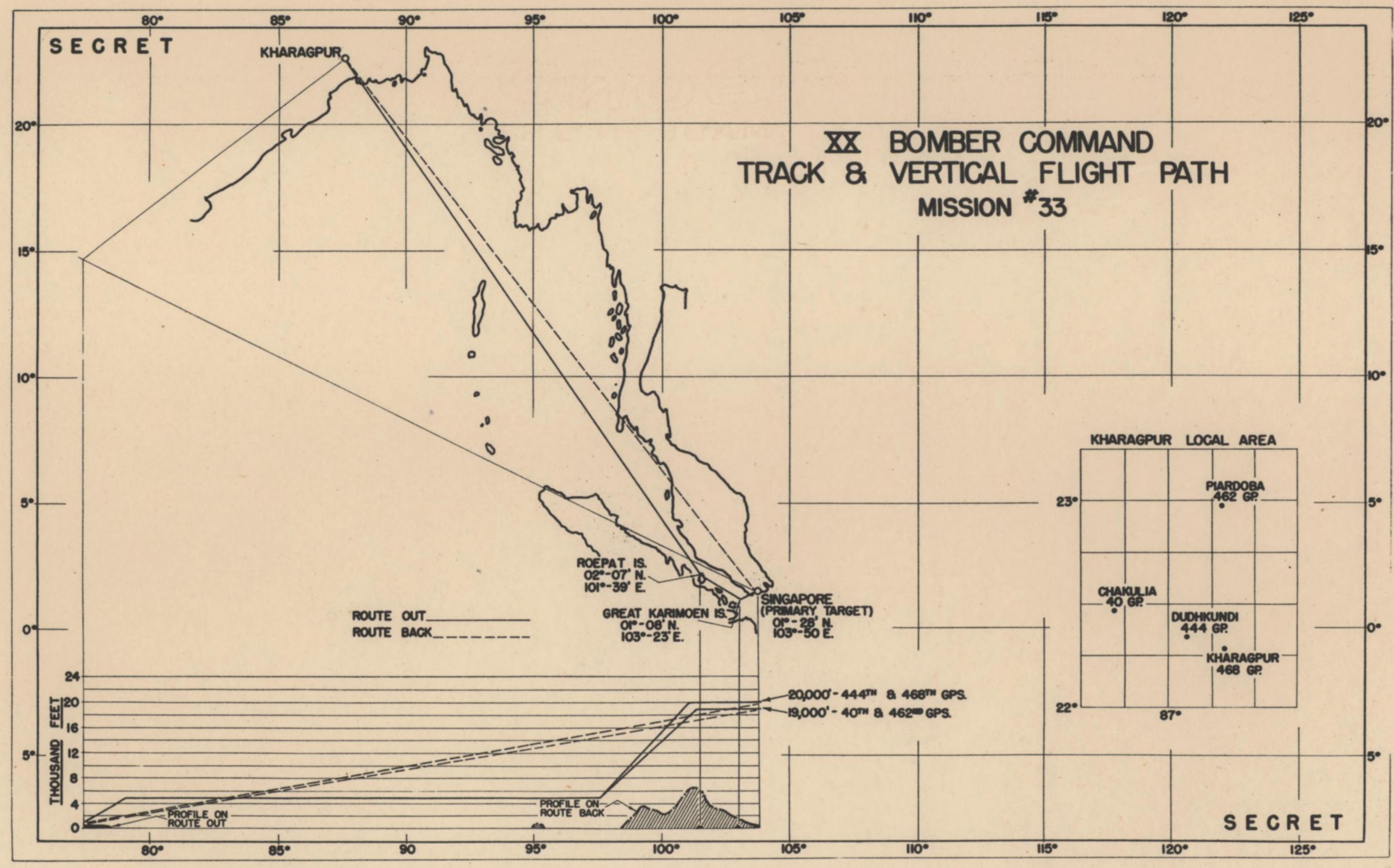
SECRET

S E C R E T

- (4) A/C #474 (462nd) landed with 1 engine feathered. Repairs required this aircraft to remain at this base. Information on time of landing not known.
 - (5) A/C #711 (462nd) landed at 0947Z low on fuel. After refueling, aircraft returned to base at 1830Z.
 - (6) A/C #424 (468th) landed because of fuel shortage. Time of landing not known.
 - (7) A/C #530 (468th) landed with #1 prop governor ~~stuck~~ caused by enemy fire. Landing was at 0924Z. Aircraft returned to base on D-day plus 1 at 0751Z.
 - (8) A/C #275 (468th) landed at 1005Z with wounded aboard. (See paragraph B 3 c). Return to base was accomplished at 1600Z.
 - (9) A/C #464 (468th) escorted A/C #275 to friendly territory and landed at this base at 0920Z. Aircraft returned to base at 1916Z.
6. Other Deviations: A/C #589 was hit by fighters after bombs away and broke away from the formation in which it was flying at 01°50'N - 103°26'E. When last seen it was reported heading for a rescue surface craft and apparently preparing to ditch. (See Annex J).

A-II-3

S E C R E T



SECRET

HEADQUARTERS
XX BOMBER COMMAND
APO 493

SECRET
Auth: CG XX BC
Date: 5 Feb 45
Initials: W

CONSOLIDATED
SPECIALIST MISSION REPORT
OF STAFF BOMBING OFFICER

Report Prepared 5 Feb 45

Field Order No. 33
Date of Mission 1 Feb 45

1. Bombing results were good on this mission considering all factors involved. Formations employed radar-bombsight technique on the approach to the target with good results. Due to the fact that there was bad cloud coverage until just prior to the attack, many bombing runs were not much more than 30 seconds duration. Many large formations bombed the target which is outstanding considering the distance traveled to assembly point and the short time spent in assembling.

2. Malfunctions reported are as follows:-

40th Group:

A/C #508 - Reported bombsight rate mechanism not operative, which was not subsequently confirmed and is charged as personnel error.

A/C #582 - Had to salvo all bombs. Bomb door safety switch was loose and failed to make contact when doors were open.

A/C #522 - Had a bomb hang up in upper station, which could neither be released normally or by salvo. Bombardier noted that A-2 release was in "fired" position and that fingers of shackle were in drop position. Bomb was jettisoned by jamming screwdriver in B-10 shackle. Group bombardier recommends that release horns of shackle be filed slightly to insure positive release.

444th Group:

A/C #375 - Intervalometer released only one bomb on first run. On second run it did not release any and salvo was accomplished. Equipment checked ok on the ground.

A/C #422 - Intervalometer counter did not move and no release resulted. Salvo accomplished. Equipment checks ok on the ground.

462nd Group:

None

468th Group:

A/C #3417 - Second bomb did not fall immediately upon release, and remaining bombs were salvaged. It is believed that the arming wire worked into position where it fouled release arm of A-2 release.

A/C #3532 - Intervalometer malfunction.

It is noteworthy that no pneumatic door malfunctions were reported.

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V - BOMB LOADING

Mission No. 33

1 February 1945

SECRET
 A-V-1

No. of Bombs		40th		441st		462nd		468th		Total			Pounds per aircraft	Tons per aircraft
M-44	M-65	A/C	M-44	A/C	M-65	A/C	M-44	A/C	M-65	A/C	M-44	M-65		
4		28	112			16	64			44	176		4073.6	2.04
5						12	60			12	60		5092.0	2.55
	4			10	40			29	116	39		156	4077.6	2.04
	5			16	80					16		80	5097.0	2.55
	6			2	12					2		12	6116.4	3.06
Total		28	112	28	132	28	124	29	116	113	236	248	4364.2	2.18

SECRET

NOTE: Bomb loads computed from actual weight of bombs.

M-44 General Purpose bomb (TNT or Amatol filled) - 1018.4

M-65 General Purpose bomb (TNT or Amatol filled) - 1019.4

VI - DISPOSITION OF BOMBS

Mission No. 33

1 February 1945

	40th		444th		462nd		468th		Total		Pounds Dropped	Tons Dropped
	A/C	M-44	A/C	M-65	A/C	M-44	A/C	M-65	A/C	G.P.*		
A/C bombing all targets and bombs dropped	27	107	27	126	27	119	28	112	109	464	472775.6	236.39
A/C over PT and bomb load carried	22	88	21	99	24	105	23a	92	90	384	391256.6	195.63
A/C bombing PT and bombs dropped	21	84	14	66	12	52	20	80	67	282	287334.8	143.67
A/C bombing A.PT and bombs dropped	1	4	7	33	12	53	1	4	21	94	95766.6	47.88
A/C bombing ST and bombs dropped	2	7	5	23	2	9	6	24	15	63	64206.2	32.10
A/C bombing L.R.T. and bombs dropped	3	12	1	4	1	5	-	-	5	21	21390.4	10.70
A/C bombing T.O. and bombs dropped	-	-	-	-	-	-	1	4	1	4	4077.6	2.04
A/C Jettisoning bombs	-	1-b	1	6	1	5	1	4	3	16	16304.4	8.15
A/C returning bombs	1	4	-	-	-	-	-	-	1	4	4073.6	2.04
Total	28	112	28	132	28	124	29	116	113	484	493153.6	246.58

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A-VI-1

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* Since both types of bombs dropped were General Purpose bombs, they have been grouped together in one total. Pounds Dropped figures reflect the actual weight of bombs dropped, however.

(M-44 1018.4 pounds) (M-65 1019.4 pounds)

a. A/C #532 and 275 (468th) were over the PT but failed to bomb it. Bombardier on A/C 532 failed to hit the salvo lever at the PT and later bombed the ST. A/C 275 suffered a direct flak hit while in the target area. Bombs were jettisoned 11 minutes after leaving the target.

b. One bomb hung up on A/C 522. Later jettisoned at 11°59'N - 95°20'E.

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VII - FORMATIONS FLOWN

Mission No. 33

1 February 1945

A. Formations Planned

1. Though no minimum striking force was ordered in the Field Order for this mission, one change was made in the assembly procedure to make possible the assembling of the largest possible formations. Airplane commanders were instructed, this time, to join the first lead crew sighted upon arrival at the assembly point regardless of unit. Lead crews were to identify themselves, as on Mission 32, by dropping smoke grenades.

2. Bombing altitudes specified were 19,000 feet for the 40th and 462nd Groups and 20,000 feet for the 444th and 468th Groups.

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 position 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 Primary Targets

1st

W 505

W 396

W 498

W 589

Aiming point - Floating drydock

Altitude - 19,000' I.

No. of A/C - 4

Axis of attack - 54°M

No. releasing - 4

IAS - 190 mph

Time of release - 0209Z

Bomb Load - 16 M-44

Method - Visual

Bombs dropped - 16 M-44

2nd

W 804

W 685

W 620

W 888

Aiming Point - Floating Drydock

Altitude - 19,950' T.

No. of A/C - 4

Axis of attack - 53°M

No. releasing - 4

IAS - 190 mph

Time of release - 0211Z

Bomb load - 16 M-44

Method - Visual

Bombs dropped - 16 M-44

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SECRET

SECRET

3rd
Z 227
Z 469 Z 424
Z 471
Z 703 Z 879
W 542
Z 691
Z 536 Z 678 Z 272

Aiming point - Floating Drydock
No. of A/C - 11
No. releasing - 11
Time of release - 0214Z
Method - Visual
Altitude - 21,300'I.
Axis of attack - 60°M
IAS - 195 mph
Bomb load - 40 M-65, 4 M-44
Bombs dropped - 40 M-65, 4 M-44

4th
W 795
W 541
W 271
W 503
W 274
W 404
W 538
Z 895
W 579
Z 529

Aiming point - Floating Drydock
No. of A/C - 10
No. releasing - 10
Time of release - 0225Z
Method - Visual
Altitude - 19,000'I.
Axis of attack - 56°T
IAS - 190 mph
Bomb load - 32 M-44, 8 M-65
Bombs dropped - 32 M-44, 8 M-65

5th
Z 714
X 720
Z 530
Z 532*
Z 429
Y 560
Y 459
Y 801
Y 531
Y 230
Y 786
Y 450
Y 540
W 407
Z 415
W 718
W 740
W 738
Y 480

Aiming Point - Floating Drydock
No. of A/C - 19
No. releasing - 18
Time of release - 0233Z
Method - visual
Altitude - 19,000'I.
Axis of attack - 65°M
IAS - 195 mph
Bomb load - 55 M-44, 24 M-65
Bombs dropped - 55 M44, 20 M-65
* A/C 532 was over PT but bombardier failed to hit salvo lever.
Bombs were later dropped on Secondary (4 M-65).

6th
X 485
X 524
X 884
X 378
X 464
X 538

Aiming point - Floating Drydock
No. of A/C - 6
No. releasing - 6
Time of release - 0234Z
Method - Visual
Altitude - 20,000'I.
Axis of attack - 54°M
IAS - 195 mph
Bomb load - 28 M-65
Bombs dropped - 28 M-65

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S E C R E T

7th

X 732

X 507

X 559

Aiming point - Center of drydock gate,
Naval Base Area.

Altitude - 20,000'I
Axis of attack - 245°M
IAS - 195 mph
Bomb load - 15 M-65
Bombs dropped 15 M-65

No. of A/C - 3

No. releasing - 3

Time of release - 0242Z

Method - Visual

8th

X 422

X 228

X 492

X 584

X 376

X 736

X 537

Aiming point - Floating Drydock

Altitude - 20,000'I
Axis of attack - 56°M
IAS - 195 mph
Bomb load - 34 M-65
Bombs dropped - 34 M-65

No. of A/C - 7

No. releasing - 7

Time of release - 0248Z

Method - Visual

9th

Z 542

Z 445

Z 275*

Z 719

Z 464

Aiming point - Floating Drydock

Altitude - 21,400'I
Axis of attack - 56°M
IAS - 195 mph
Bomb load - 20 M-65
Bombs dropped - 16 M-65

No. of A/C - 5

No. releasing - 4

Time of release - 0251Z

Method - Visual

* A/C 275 was hit in radar section by A/A just before bomb release line. Four M-65 bombs were jettisoned 11 minutes beyond PT.

10th

Y 454

Y 463

Y 473

Y 590

Y 488

Y 904

Y 484

Y 506

Y 521

Y 711

W 527

Z 546

Y 474

X 273

Y 476

X 268

X 496

X 451

A-VII-3

S E C R E T

SECRET

Aiming point - Center of drydock gate,
Naval Base Area
No. of A/C - 18
No. releasing - 18
Time of release - 0259Z
Method - Visual
Altitude - 19,000'I
Axis of attack - 36°M
IAS - 195 mph
Bomb load - 57 M-44, 22 M-65
Bombs dropped - 57 M-44,
22 M-65

11th

Y 299

Y 475

Y 503

Aiming point - Floating Drydock
No. of A/C - 3
No. releasing - 3
Time of release - 0322Z
Method - Visual
Altitude - 19,000'I
Axis of attack - 53°M
IAS - 183 mph
Bomb load - 13 M-44
Bombs dropped - 13 M-44

2. Aircraft over 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>
1st	X-873	0024Z	visual	18,000'I	150°M	195	5 M-65	5 M-65
2nd	W-508	0029Z	radar	19,000'I	156°M	190	4 M-44	4 M-44
3rd	W-522	0041Z	visual	15,000'I	30°M	195	4 M-44	3 M-44*
4th	Z-208	0108Z	visual	20,100'T	95°M	197	4 M-65	4 M-65
5th	X-857	0124Z	blind	20,000'I	120°M	195	5 M-65	5 M-65
6th	Y-838	0135Z	visual	17,000'I	155°M	195	5 M-44	5 M-44
7th	Z-417	0208Z	visual	20,300'T	335°M	190	4 M-65	4 M-65
8th	X-375	0227Z	visual	20,000'I	155°M	180	5 M-65	5 M-65
9th	Z-487	0230Z	visual	19,500'T	13°M	185	4 M-65	4 M-65
10th	Z-734	0233Z	visual	21,250'T	140°M	195	4 M-65	4 M-65
11th	Y-502	0247Z	visual	19,000'I	355°M	200	4 M-44	4 M-44
12th	X-861	0315Z	visual	20,000'I	338°M	200	4 M-65	4 M-65
13th	Z-460	0315Z	visual	19,400'T	335°M	200	4 M-65	4 M-65
14th	X-472	0359Z	visual	20,000'I	340°M	195	4 M-65	4 M-65
15th	Z-532	0359Z	visual	21,300'T	320°M	195	4 M-65	4 M-65

* 1 M-44 jettisoned.

3. Aircraft over Last Resort Target

1st	X-730	2222Z	visual	10,000'I	90°M	190	4 M-65	4 M-65
2nd	W-455	2339Z	visual	19,000'I	77°M	195	4 M-44	4 M-44
3rd	W-729	0014Z	visual	18,000'I	75°M	193	4 M-44	4 M-44
4th	Y-800	0016Z	visual	16,000'I	72°M	195	5 M-44	5 M-44
5th	W-233	0042Z	visual	19,000'I	20°T	187	4 M-44	4 M-44

4. Aircraft over Target of Opportunity (Bassein)

1st	Z-456	0445Z	visual	10,600'T	18°M	185	4 M-65	4 M-65
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A-VII-4

SECRET

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HEADQUARTERS
XX BOMBER COMMAND
APO 493

SECRET

Auth: CG XX BC

Initials

Date: 4 Feb 45

CONSOLIDATED
SPECIALIST MISSION REPORT
OF STAFF NAVIGATION OFFICER

Date Prepared: 3 February 1945

Field Order Number 33
Date of Mission: 1 Feb 45

1. In the daylight attack against shipping repair facilities in the Singapore Area, navigation was consistently excellent, with an exceptional amount of celestial work being accomplished by individual navigators.

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

	<u>Nav. Time Out</u>	<u>Nav. Time Back</u>	<u>Assembly Time</u>
40th Group	8h 49m	8h 12m	7 min.
444th Group	9h 00m	8h 20m	(none given)
462nd Group	9h 00m	7h 49m	17 min.
468th Group	8h 27m	7h 34m	9 min.

b. The following navigational aid work was reported:

	<u>CEL LOP's</u>	<u>CEL FIXES</u>	<u>RADIO FIXES</u>	<u>QDMS</u>
40th Group	145	98	5	0
444th Group	125	77	0	0
462nd Group	104	67	15	2
468th Group	197	109	6	0

c. Forecast winds were excellent. Computed winds were as follows:

	<u>Half-Way Out</u>	<u>Target</u>	<u>Half-Way Back</u>
40th Group	4000' 144° 11K	19,000' 113° 15K	13,000' 145° 15K
444th Group	3000' 103° 10K	20,000' 98° 18K	8000' 116° 15K
462nd Group	Reported light and variable entire flight.		
468th Group	6200' 183° 14K	20,000' 100° 19K	14,200' 148° 14K

d. Quality of radar cooperation on this mission can be characterized as being very satisfactory, to excellent.

2. Group navigators are to be commended for the quality of specialist reports now being submitted.

3. 468th Group reported that navigators comment on being routed over enner airdromes on the return route. In this constant battle of gas versus bombs, as nearly direct routes as possible are selected in order to conserve on distance. Inasmuch as it may be fairly supposed that inner defenses have been alerted by planes approaching the target, it is believed that with altitude advantage and with all other factors considered, the direct route is the best in this case.

SECRET

DECLASSIFIED
Authority 760063
By CD NAPA Date 12/1/88

S E C R E T

ANNEX

B

ENEMY ANTLAIRCRAFT

*Prepared by: *
* *
* Flak Officer *
* *
* XX Bomber Command *

S E C R E T

DECLASSIFIED
Authority *now* 760063
By *CD* NAPA Date *12/1/88*

SECRET

* * * * *
* SECRET *
* By Auth of the C.G. *
* XX Bomber Command *
* 11 Feb 45 [Signature] *
* Date Initials *
* * * * *

HEADQUARTERS
XX BOMBER COMMAND
Intelligence Section
APO 493

11 February 1945

* * * * *
* CORRECTION to REPORT #30-31 1 February 1945 *
* Section 5, page B-I-3, third paragraph, line 2, "reported as *
* meager but intense" should be changed to read "inaccurate but intense" *
* * * * *

PRELIMINARY REPORT

ANTI-AIRCRAFT OPPOSITION

MISSION NUMBER 35, (DAYLIGHT), 1 FEBRUARY 1945

Primary Target - SINGAPORE NAVAL BASE AREA, JOHORE STRAITS,
Secondary Target - GEORGETOWN, PENANG ISLAND, Target of Last
Resort - MARTABAN, BURMA.

A. ANTI-AIRCRAFT FIRE ENCOUNTERED

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

Moderate and inaccurate (42%) to accurate (58%) heavy anti-aircraft fire was encountered by all aircraft bombing this area from 0209Z to 0322Z from 18,500 to 21,400 feet altitude through an average undercast of 5/10. The following table shows aircraft over the area in relation to time and heavy AA fire encountered:

Table I: Formations vs. Fire Encountered

Formation	Number of A/C	Bomb Release Time	Time Encountered	Average Fire Encountered	Altitude in feet	Undercast	Heading
1	4	0209Z	0206-14Z	Moderate-Inaccurate	19,900	CAVU-5/10	54°M
2	4	0211Z	0210-14Z	Moderate	19,800	CAVU-5/10	53°M
3	11	0214Z	0203-13Z	Moderate-Inaccurate to Accurate	20,600-21,300	CAVU-6/10	60°M
4	10	0225Z	0223-30Z	Moderate-Inaccurate	20,000	2/10-7/10	56°M
5	19	0233Z	0230-32Z	Moderate	19,000-20,900	4/10-7/10	65°M
6	6	0234Z	0231-35Z	Moderate	20,000	5/10-7/10	54°M
7	3	0242Z	0241-43Z	Moderate - Accurate	21,000	6/10-7/10	245°M
8	7	0248Z	0246-49Z	Moderate - Accurate	21,000	5/10-8/10	56°M
9	5	0251Z	0247-51Z	Intense - Accurate	20,000	7/10	56°M
10	18	0259Z	0255-0300Z	Moderate - Accurate	19,400-21,000	4/10-9/10	36°M
11	3	0322Z	0322-28Z	Meager - Accurate	20,500-20,700	7/10	53°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:

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Table II: Intensity, Accuracy and Deviations.

<u>Reports of Accuracy</u>		<u>Reports of Intensity</u>	
Struck	10 percent	Intense	21 percent
Rocked	13 percent	Moderate	48 percent
Within 150'	35 percent	Meager	31 percent
Outside 150'	42 percent		

<u>Reports of Deviations</u>					
Above	28 percent	Ahead	24 percent	Left	21 percent
Level	42 percent	Abreast	30 percent	In Line	46 percent
Below	30 percent	Behind	46 percent	Right	33 percent

Black bursts were observed by all aircraft while 26 observed white and 9 observed phosphorous AA in addition to reports of purple, red, yellow and brown. It is not believed that the elevation of the sun but possibly variations in the development of these bursts were responsible for the multi-colored sightings. A more persistent flash (red, yellow or orange) concomitant with less smoke (black or white) could result in observations as received. These same multi-colored bursts, however, were also reported for Mission #15 over the NAVAL BASE Area when formations were engaged by a NACHI Class CA. And in addition naval reports of heavy antiaircraft opposition encountered by Task Force 58 in the Battle of the Philippine Sea states that "there is strong evidence . . . that the Japanese use colored bursts as an aid to the individual ships in filling their allotted segment of the sky . . ." (Flak Information Bulletin No. 3, Oct 44, Confidential, OPNAV-16-V#61). Continuing reports of multi-colored bursts would establish their application for purposes of identification of fire by Japanese units (naval) responsible for the employment of this type of ammunition.

Naval shipping present and contributing antiaircraft opposition consisted of a NACHI Class CA in the #1 Dock, an ATAGO Class CA, and a 285 foot DD. Approximately 25,000 tons of merchant shipping was also present in the JOHORE STRAITS, but it is not believed that these vessels contributed effective opposition, if any. It was reported by A/C 492 (Formation #8) of the 444th Group that fire from the two CA's burst in teardrop shape (rather than mushroom) and that bursts were "noticeably larger in diameter", than that from land-based sites. Also observed by A/C 424 (Formation #3) of the 468th Group were two "large flaming bursts" approximately 3 times the size of the usual flak burst. Black smoke was first seen followed by a sheet of flame like that from "a flame thrower". Other aircraft of this same formation reported these same bursts accurate for altitude but trailing in addition to the normal phosphorous antiaircraft bursts. Aircraft of Formation #5 reported a very large "plume of white smoke" in the concentration of fire directed at Formation #4. Further peculiar fire was observed by A/C 546 (468th Group) of Formation #10 consisting of "one white burst below and ahead which spun in a circle in the vertical plane". The burst was not similar to recognized phosphorous AA.

From 3 to 30 bursts were observed at any one instant while from 12 to approximately 250 were reported for any one encounter. No distinction could be made regarding types of fire employed by land-based and ship-borne guns, but it is known that the total defense utilized Continuously Pointed, Predicted Concentration and possibly Barrage types of fire. Identifying Predicted Concentration A/C 884 (444th Group) of Formation #6

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reported that "bursts appeared at once at one particular point, never following the formation, and as each formation passed the given point, the concentration would appear". The Flak Officer of the 40th Group also stated, "Observations of bursts stretching out leave no doubt that Continuously Pointed fire was employed while on the bomb and camera run. However, grouping of bursts in a small air volume as well as scattered bursts covering all deviations, in relation to the formation, in a fairly wide area influenced some observers to believe that Predicted Concentration and Barrage fire were also employed".

With an average heading of approximately 55° , aircraft passed just within the maximum envelope of the SINGAPORE TOWN defense where meager and inaccurate antiaircraft fire was encountered. Several aircraft reported that the first fire encountered from the NAVAL BASE Area originated from the NAVAL Vessels at about the same time land-based installations in the KING'S DOCK Area (SINGAPORE TOWN) commenced firing, followed by land-based units at the NAVAL BASE. It was also reported that just prior to bomb release, the intensity of heavy antiaircraft fire increased for all formations.....Gun flashes were reported from along the north wharf area of the NAVAL BASE and from the CA anchored in the JOHORE STRAITS just NW of the Floating drydock." Heavy AA fire was encountered on an average of 2.3 prior to and 1.7 minutes following the bomb release time (Table I).

Formations #5, 9 and 10 reported lone enemy aircraft flying parallel courses at the same altitude. Coincident and following reports of "thistle" aircraft, the Accuracy of Heavy AA opposition improved (Table I) indicating that these "pacer" aircraft were possibly reporting present position data or deviations to antiaircraft installations. The enemy aircraft reported by Formation #9 flew a parallel course from the Northeast tip of GREAT KARIMONEN ISLAND ($01^{\circ}08'N - 103^{\circ}23'E$) to the NAVAL BASE Area. No other enemy aircraft were reported by other formations.

Meager and inaccurate automatic weapons fire was also encountered by several formations from sections of SINGAPORE ISLAND enroute to the NAVAL BASE Area. It was reported as white and light gray, as bursting from 5,000 to 10,000 feet below the formations, and as originating from both land-based installations and Naval units in the area.

There is a possibility but no definite indication of the use of gun-laying radar through R.C.M. intercepts or undercast conditions.

2. KALLANG AIRDROME, SINGAPORE ($01^{\circ}23'N - 103^{\circ}52'E$)

Two aircraft of Formation #4 pinpointed antiaircraft opposition encountered from the SINGAPORE Town area as originating from KALLANG AIRDROME at 0223Z while enroute to the NAVAL BASE Area on a heading of $56^{\circ}T$ and at an altitude of 20,000 feet through a $7/10$ undercast.

Both heavy antiaircraft and automatic weapons fire was encountered with white and black bursts. Fire was described as moderate and inaccurate with the number of bursts observed at any one instant varying from 8 to 10 resulting in a total count of 40. Deviations were level or below, behind, and in line or to the right. No enemy aircraft were observed on the same course and altitude. Continuously Pointed fire is believed to have been used.

3. Southwest Tip of SINGAPORE ISLAND ($01^{\circ}20'N - 103^{\circ}38'E$)

Two aircraft of Formation #8 (Table I) pinpointed black heavy antiaircraft opposition encountered while enroute to the NAVAL BASE at 0239Z

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at 20,000 feet under CAVU conditions as originating from the southwest tip of SINGAPORE ISLAND.

Fire was described as moderate and inaccurate with 3 bursts observed at any one instant resulting in a total of 15 for the encounter. Deviations were above and below, behind, and either in line or to the right. No enemy aircraft were reported on the same course and altitude.

4. CAPE FLAI (01°16'N - 103°31'E)

One aircraft of 10 (Formation #4) encountered light gray meager and inaccurate heavy antiaircraft fire at 0216Z at 20,000 feet through a 2/10 undercast. A total of 6 bursts was observed for the encounter with deviations of level, behind, and to the right. No enemy aircraft were observed on the same course and altitude. Barrage type fire is believed to have been used. This fire probably originated from sites on SINGAPORE ISLAND.

5. ROEPAT ISLAND (02°07'N - 101°39'E)

Three aircraft of a total of 30 (Formations #3 and #5) reported meager and inaccurate heavy antiaircraft and automatic weapons fire at 0113Z and 0140Z from 19,900 to 21,000 feet through 3/10 to 9/10 undercast. One phosphorous AA burst was reported at 0113Z level, abreast and to the right with no enemy aircraft on the same course and altitude.

A total of 4 AW bursts was also observed at 0113Z approximately 15,000 feet below, ahead and to the right. Three brown heavy AA bursts, occurring independently with deviations of below, abreast and to the right, were reported for the 0140Z encounter. No enemy aircraft were on the same course and altitude.

Although this island was used as the Assembly Point for all aircraft attacking the SINGAPORE AREA, the above three encounters consisted of the total opposition.

6. BEKOK AIRFIELD (02°20'N - 103°05'E)

One aircraft of a total of 4 (Formation #2) reported meager and inaccurate heavy antiaircraft fire at 0227Z (16 minutes after bombs away) at an altitude of 18,500 feet under CAVU conditions. A total of 3 bursts were observed, occurring independently, with deviations of above, ahead and abreast, and to the left. No enemy aircraft were reported on the same course and altitude. Continuously Pointed fire is believed to have been used.

7. SHIPPING

a. Unidentified Shipping at 04°32'N - 100°10'E

One aircraft reported meager and inaccurate black and white heavy antiaircraft fire at 0055Z at 20,000 feet under CAVU conditions. Deviations were below, abreast and in line and no enemy aircraft were reported on the same course and altitude.

b. Unidentified Shipping at 03°40'N - 100°23'E

One aircraft reported meager and inaccurate black heavy anti-aircraft fire at 0100Z at 20,000 feet under CAVU conditions. A total of from 5 to 6 bursts were seen with deviations of below, behind and to the

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left. No enemy aircraft were reported on the same course and altitude and fire is believed to have been Continuously Pointed.

8. BAYAN LEPAS A/F, PENANG ISLAND (05°17'N - 100°16'E)

One aircraft encountered meager and inaccurate white automatic weapons fire at 0032Z at 19,000 feet under CAVU conditions. A total of 3 bursts, occurring independently, with deviations of below, behind and in line were reported. No enemy aircraft were on the same course and altitude.

9. Vicinity of POINT STUART, ANDAMANS ISLANDS (13°20'N - 92°50'E)

One aircraft encountered meager and inaccurate automatic weapons fire (red tracers) at 2058Z at 3,000 feet altitude under CAVU conditions. A total of 25 bursts, occurring 5 at a time, were observed level, ahead and to the right.

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

Four aircraft of a total of 16 over the area encountered meager and generally inaccurate black heavy antiaircraft fire from 0023Z to 0316Z at altitudes of from 15,000 to 21,000 feet as follows:

Table III: Aircraft vs. Fire Encountered.

Formation	Number of A/C	Bomb Release Time	Time Encountered	Fire Encountered	Altitude in feet	Undercast	Heading
1	1	0024Z	0023Z	Meager-Inaccurate	18,000	5/10	150°M
2	1	0029Z	-----	None	19,500	3/10	156°M
3	1	0041Z	0040Z	Meager-Inaccurate	15,000		30°M
4	1*	-----	0100Z	Meager-Inaccurate	15,000	CAVU from Varied	-----
5	1	0108Z	-----	None	20,100		95°M
6	1	0124Z	-----	None	20,000		120°M
7	1	0135Z	-----	None	17,000		155°M
8	1	0208Z	-----	None	20,300		335°M
9	1	0227Z	-----	None	20,000		155°M
10	1	0230Z	-----	None	19,500		013°M
11	1	0233Z	-----	None	21,250		140°M
12	1	0247Z	-----	None	19,000		355°M
13	1	0315Z	0314-16Z	Meager - Accurate	21,000		338°M
14	1	0315Z	-----	None	19,400		335°M
15	1	0359Z	-----	None	20,000		340°M
16	1	0359Z	-----	None	21,300		320°M

* This aircraft encountered fire while enroute to SINGAPORE which it bombed at 0214Z.

The number of bursts observed at any one instant varied from 2 to 4 with a resulting total for any encounter of from 2 to 7. Deviations were generally level, or below, behind, and in line or to the left or right. No enemy aircraft were reported on the same course and altitude, and the fire encountered by formations #1 and #3 is believed to have been Continuously Pointed.

11. MARTABAN-MOULMEIN AREA (15°33'N - 97°36'E)

One aircraft of a total of 5 bombing the area encountered meager and inaccurate black heavy antiaircraft fire at 0016Z at 17,000 feet under

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CAVU conditions. The following table shows aircraft over the area in relation to fire encountered:

Table IV: Aircraft vs. Fire Encountered

Formation	Number of A/C	Bomb Release Time	Time Encountered	Heavy AA Fire Encountered	Altitude in Feet	Undercast	Heading
1	1	2222Z	-----	-----None-----	10,000	CAVU	90°M
2	1	2339Z	-----	-----None-----	19,000	CAVU	77°M
3	1	0014Z	-----	-----None-----	18,000	CAVU	75°M
4	1	0016Z	0016Z	Meager-Inaccurate	17,000	CAVU	72°M
5	1	0042Z	-----	-----None-----	19,000	CAVU	20°T

A total of 10 bursts, all occurring at approximately the same time, were observed below, behind and in line with the aircraft. No enemy aircraft were observed on the same course and altitude. Fire is believed to have been Predicted Concentration.

12. BASSEIN (16°44'N - 94°45'E)

One aircraft bombed this area from 10,600 feet at 0230Z under CAVU conditions but no antiaircraft opposition was encountered.

B. GROUND-TO-AIR ROCKETS AND BARRAGE BALLOONS

None reported.

C. HIGH-ALTITUDE BALLOONS

One possible high-altitude balloon was sighted by one aircraft of the 468th Group at 0053Z from 20,000 feet over the northwest side of PENANG ISLAND (05°25'N - 100°21'E). The balloon, described as teardrop in shape and silver, was reported at an altitude of approximately 10,000 feet. No photographs were obtained.

D. SMOKESCREENS

Based on interpretation of strike photos and crew observations, an ineffective attempt was made to screen NAVAL BASE INSTALLATIONS, JOHORE STRAITS, Singapore.

An inspection of the Table V shows that the enemy initiated operation of generators located at the NAVAL BASE and on 2 small craft cruising about the FLOATING DRYDOCK concurrent with the appearance of the first formation of aircraft bombing the area. Additional generators were placed in operation at the NAVAL BASE and the TANK FARM up to 0214Z when a maximum of 12 were identified.

After 0233Z no generators were in operation in the area, but by this time the ship in the FLOATING DRYDOCK had been hit and set afire resulting in better concealment of the area than when the generators were in operation.

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Table V: Smokescreen - NAVAL BASE Area

Total Generators in Operation	Time	Location of Generators
3	0209Z	1 - Land based in the Naval Base Area 2 - On small craft cruising about the Floating Drydock
9	0211Z	6 - Land based in the Naval Base Area 2 - On small craft cruising about the Drydock 1 - At the Tank Farm approximately 8000' WSW of Floating Drydock
12	0214Z	9 - Land based in the Naval Base Area 0 - On small craft, no longer cruising about the Floating Drydock 3 - At the Tank Farm
8	0225Z	3 - Land based in the Naval Base Area 5 - (Approximately) At the Tank Farm
6	0233Z	1 - Land based in the Naval Base Area 5 - (Approximately) At the Tank Farm
0	0234Z	
0	0251Z	

E. BLACKOUT

None - daylight mission.

F. DAMAGE FROM HEAVY ANTI-AIRCRAFT FIRE

Two aircraft sustained major damage and 7 aircraft minor damage as a result of flak while over the NAVAL BASE AREA, JOHORE STRAITS, Singapore Island as follows:

Table VI: Damage

Forma- tion	A/C	Group	Bomb Release	Heading	Altitude	Classification
3	536	468th	0214Z	60°M	21,300'	Minor
5	720	444th	0233Z	65°M	19,000'	Minor
6	464	444th	0234Z	54°M	20,000'	Minor
8	736	444th	0248Z	56°M	20,000'	Major
9	275	468th	0251Z	56°M	21,400'	Major
9	719	468th	0251Z	56°M	21,400'	Minor
10	451	444th	0259Z	36°M	19,500'	Minor
10	590	462nd	0259Z	36°M	19,500'	Minor
10	711	462nd	0259Z	36°M	19,500'	Minor

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As this formation was experiencing weak and ineffective enemy fighter attack and air-to-air bombing (no encounters reported by A/C 711 or 454 with 13 E/A encounters and 6 air-to-air bombing encounters reported by the formation with no damage) in addition to moderate and generally accurate heavy antiaircraft fire, the origin of the two phenomena cannot be definitely determined.

It is possible that these two encounters are similar to events reported by the 28th Photo Reconnaissance Squadron in Intelligence Summary Number 47, 26 August 1944, Headquarters 7th Air Force, APO 953, as follows:

"On 22 August during a photo reconnaissance flight over PAGAN Island Captain Taylor, 28th Photo Reconnaissance pilot came back with this report:

"The dive bombers (P-47's) were going in at six to seven thousand feet and diving to two to three thousand feet to release their bombs. Captain Taylor was flying at 13,000 feet making photographic coverage of the assault. The light and medium AA was intense and accurate. Three P-47's were hit and 1 pilot bailed out. At two different times during the run Captain Taylor reports that his plane, an F-5B, vibrated severely as if an AA shell had burst very close to it. The first time it happened Captain Taylor looked in every direction and changed his altitude and speed but could not see any evidence of an AA burst. The second time it occurred he did the same thing. No AA bursts at his altitude could be seen. Captain Taylor reported that general flying conditions were smooth.

"This squadron has made 12 photo reconnaissance flights over PAGAN Airfield and on 3 occasions this same type vibration has been reported. If the Japs have any so-called smokeless AA bursts it is our pilots belief that they are used at PAGAN."

Unfortunately the 7th Air Force report does not mention the extent or lack of concurrent enemy fighter opposition. But it is known that aircraft experiencing these similar occurrences were under accurate antiaircraft fire at the appropriate times. The possibility of an air-to-air projectile should not be ruled out, but preliminary conclusions indicate that the Japanese may be employing smokeless and fragmentless antiaircraft projectiles designed to cause damage through concussion alone.

H. WARNING NETS

It is evident that the enemy did not utilize the prior warning he should have had as aircraft were tracked by early warning radar from the GREAT COCO-ANDAMAN ISLANDS Area to SINGAPORE. The PENANG early warning radar was in operation in addition to units in the SINGAPORE Area.

The first enemy fighter attack occurred at the first bombs away time (0209Z) and no sightings were reported prior to this time. Also, the attempted smokescreen was in process of development at 0209Z, not reaching maximum effort until approximately 0214Z (Table V).

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

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ANNEX

C

ENEMY AIR OPPOSITION

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

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By *CD* NAPA Date *12/1/88*

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I. JAPANESE FIGHTER TACTICS - MISSION NO. 33

TARGET; Singapore, Malaya.

TIME: Day Mission.

DATE: 1 February 1945.

1. GENERAL

a. Enemy air opposition was rated weak. Of the 109 B-29's bombing all targets 56 were intercepted. A total of 121 individual encounters developed from 87 attacks by single planes and 15 coordinated attacks which employed 34 enemy planes. Aerial bombs were employed in 36 encounters. One B-29 is missing due to enemy fighter action (presumed to have ditched near the primary target), two B-29's received major damage, and five suffered minor damages. Preliminary claims against enemy aircraft were three destroyed, four probably destroyed and 14 damaged. The enemy force opposing B-29's was estimated at 20 OSCARS, 16 TOJOS, 8 ZEKES, 4 VALS, 3 TONY'S, 1 NICK, 1 RUFÉ, 1 ZEKE 32, 10 unidentified single engine aircraft and 1 unidentified 2 place enemy fighter.

b. 119 encounters (98 per cent of the total) were in the primary target area, one over the secondary target, and one about midway between SINGAPORE and PENANG ISLAND, the latter occurring as the B-29 was enroute home from SINGAPORE. Of the 119 encounters in the primary target area, 28 (23%) occurred before bombs away, 2 (2%) during bombs away, and 89 (75%) after bombs away. The percentage of encounters after bombs away is higher than on Mission No. 27 (57%), but closely parallels the first mission to SINGAPORE, Mission No. 15 (76%). Air action extended over a period of 1 hour and 18 minutes, from 0209Z to 0327Z, at altitudes from 17,500 to 21,000 feet.

c. The number of encounters by individual types of enemy aircraft is shown in the following table:

Table No. 1 - Details of Encounters

<u>Location</u>	<u>No. of Encounters</u>	<u>Type of E/A</u>	<u>Time</u>	<u>Altitude</u>
Primary Target (Singapore)	119	40 by OSCARS	0209Z	17,500
		31 by TOJOS	to	to
		15 by ZEKES	0327Z	21,000
		6 by VALS		
		5 by TONY'S		
		1 by NICK		
		1 by ZEKE 32		
		19 by Unident. S/E fighters		
		1 by Unident.		
		2 place fighter.		
Secondary Target (Georgetown)	1	1 by RUFÉ	0040Z	15,000
03°18'N-101°55'E	1	1 by TOJO	0232Z	19,000

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2. DIRECTIONS AND LEVELS OF APPROACH

a. The majority of the encounters, 39 per cent, originated from the frontal quarter, comparing closely to Mission No. 27, when it was 38 per cent. Changes, however, were noted in other quarters, with 19 per cent of encounters originating from the right side, 9 per cent from the rear, and 33 per cent from the left quarter. The percentage of encounters from the left quarter was more than twice that of Mission No. 27 (16%), and encounters on the right quarter were less, comparing to 29 per cent on Mission No. 27. Analysis of directions of approach indicated that a greater than usual number of coordinated attacks on Mission No. 33 originated from the 10 o'clock position, and conversely, a lesser number came from the right side, from the usual 2 and 3 o'clock positions. The azimuth of the sun in relation to the axis of attack and the turn for the course home after bombing was considered in an attempt to determine a reason for the shift, but it was found that left side attacks (from about 10 o'clock) were executed with the sun on the left beam of the enemy fighters before bombs away, and almost directly into the sun after bombs away. Thus, it is difficult to explain the shifting from right side to left side approaches.

b. As to levels of approach, an unusual number were high, 71 per cent, in comparison to Missions No. 27 (47%), and No. 15 (38%). A partial explanation for this may exist in the fact that average altitudes flown on the two previous missions were higher than on Mission No. 33. On Mission No. 15, B-29's were intercepted up to 22,750 feet and on Mission No. 27 up to 25,200 feet, while the highest reported interception on Mission No. 33 was 21,000 feet. Of the remainder on this mission, 17 per cent were level, and 12 per cent were low. The small number of low approaches is not surprising as RCM indications were that the Japanese had sufficient warning of the approach of B-29's to have their fighters airborne and waiting over SINGAPORE.

c. A summary of directions and levels of approach for all encounters is shown in Tables No. 2 and No. 3, and in Exhibit A.

Table No. 2 - Direction and Level of Approach

Direction of Encounter	Front			Right			Rear			Left			Total
	11	12	1	2	3	4	5	6	7	8	9	10	
High	19	11	8	11	4	2	2	2	3	2	3	19	86 (71%)
Level	2	1	2	3	2	0	1	2	1	2	3	1	20 (17%)
Low	3	1	0	1	0	0	0	0	0	4	5	1	15 (12%)
Total	24	13	10	15	6	2	3	4	4	8	11	21	121 (100%)
	47(39%)			23(19%)			11(9%)			40(33%)			

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Table No. 3 - Level of Approach

Level of Approach	Front	Right	Rear	Left
High	38 (81%)	17 (74%)	7 (64%)	24 (60%)
Level	5 (11%)	5 (22%)	4 (36%)	6 (15%)
Low	4 (8%)	1 (4%)	0 (0%)	10 (25%)
Total	47 (100%)	23 (100%)	11 (100%)	40 (100%)

3. EXCHANGE OF FIRE

a. Japanese pilots opened fire in 51 known encounters, 42 per cent of the total. This is considerably lower than Missions No. 27 (61%), and No. 15 (54%), but is accounted for to a certain extent by the large number of encounters (40, or, 33 per cent of the total) in which enemy fire was reported as "unknown"; it is probable that the enemy fired in more than 51 encounters. The majority of enemy pilots opened fire at longer ranges than on these previous missions and, as a result, observations were difficult. B-29's opened fire in 115 of the 121 encounters (95%), a slightly higher than usual figure, but consistent with a rising trend of B-29 fire which has become evident on recent missions to other areas as well as SINGAPORE. Table No. 4, Distances Opened Fire, shows the various ranges at which both sides opened fire.

Table No. 4 - Distances Opened Fire

Distance (yards)	Enemy Fire		B-29 Fire	
	No. of Attacks	Percent	No. of Attacks	Percent
0 - 499	1	2	8	7
500 - 799	15	29	23	20
800 - 999	14	28	34	30
1000 & over	21	41	50	43
Totals	51	100	115	100

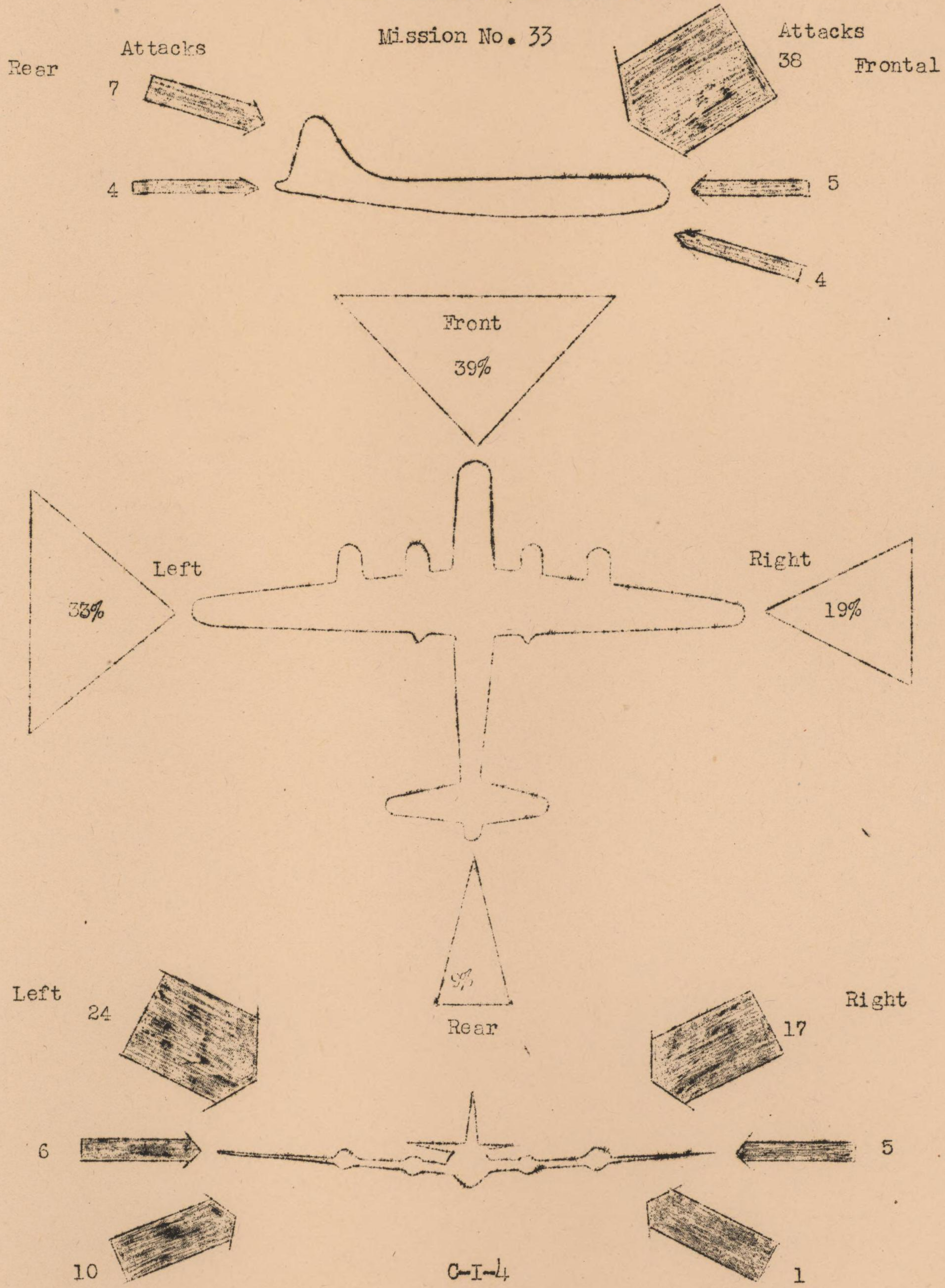
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Exhibit A

DIRECTION AND LEVEL OF APPROACH



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4. AGGRESSIVENESS OF ENEMY ATTACKS AND PILOT ABILITY

a. Japanese pilots exhibited about the same degree of aggressiveness noted on the previous mission, No. 27, to the same area. 34 per cent of the encounters were pressed to distances under 250 yards. Several instances were reported of enemy pilots flying through formations in their breakaways but, on the whole, crew reports indicated that Japanese pilots in the SINGAPORE area did not attack with the same determination as those based in CHINA, MANCHURIA and KYUSHU. The flying skill of these enemy pilots appeared to be on a fairly high level notwithstanding their evident reluctance to press the attacks closely. There were 15 coordinated attacks, in which enemy elements varying from 2 to 5 aircraft were employed, and for the most part were well executed as to flying ability even though they were not closely pressed.

b. A clear and definite estimate of enemy pilot aggressiveness in the SINGAPORE area was difficult to make. For example, one crew reported that some enemy pilots were aggressive and determined even to the extent of flying through their own anti-aircraft in order to attack B-29's; another unit of Japanese pilots in the same area were reported as merely performing acrobatics and other aerial maneuvers, making no attempt to attack. The latter group was probably composed of green and inexperienced pilots sent up to get the planes off the ground, to observe the tactics of the more seasoned Jap pilots and possibly to impress B-29 crews with Jap flying skill.

c. Table No. 5 shows distances to which enemy fighters pressed their attacks.

Table No. 5 - Distances to which Attacks Were Pressed

<u>Distance (yards)</u>	<u>No. of Encounters</u>	<u>Percent</u>
1000 & over	7	6
800 - 999	20	17
500 - 799	21	17
250 - 499	32	26
0 - 249	<u>41</u>	<u>34</u>
Total	121	100

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5. AERIAL BOMBING ATTACKS

a. 36 aerial bombing attacks (30 per cent of total encounters) were reported, a higher number than encountered on either of the two previous missions. The majority of bombs were of the phosphorous-type and, as usual, ineffective.

b. Bombs were dropped during both single plane and coordinated attacks, and by various methods. Some enemy fighters flew high overhead, out of range, and bombed from level flight. Others dived at formations in typical dive-bombing fashion, releasing their bombs at the bottom of the dive then zooming out of the way, and still others approached very close to formations and "flipped" their bombs. Explosions occurred above, below and on all sides of formations, but none was close enough to cause any damage. The fact that most attacks were made after bombs away also reduced the "nuisance" value of these aerial bombing attacks to a far greater degree than if they had occurred before bombs away, and, particularly, during the bomb run.

c. One formation reported that two enemy aircraft were observed doing acrobatics out in front in a possible attempt to divert attention from other Jap planes attacking with aerial bombs.

d. An OSCAR, flying parallel about 1000 yards above and to the right of a formation of B-29's, banked sharply to the left, "flipped" a bomb from its belly and flew over the formation in its breakaway. The bomb was seen to ignite at almost the same instant it left the OSCAR'S belly, and resembled a red ball of fire. No further observations were made at the time and the question arises whether it involved some hitherto unencountered type of aerial projectile, some form of firing mechanism for a rocket projectile (or the projectile itself) or whether it was simply a premature explosion of some ordinary aerial bomb.

e. An extremely large aerial bomb burst was reported by one crew. The bomb, possibly a phosphorous-type, exploded violently, and greyish white smoke expanded to about 100 feet, with long streamers extending in all directions. B-29's have encountered similar large bursts in other target areas, notably OMURA, where, on Mission No. 17, streamers from several phosphorous-type bomb bursts mushroomed out to distances of 150 to 500 feet.

f. One enemy aircraft (unidentified) was reported to have either ejected smoke or dropped a quickly exploded aerial bomb which resembled in every way a small cloud. It was without the usual tentacles which characterize phosphorous-type bombs.

6. COORDINATED ATTACKS

a. There were 15 coordinated attacks, employing 34 enemy aircraft and resulting in 34 individual encounters, 28 per cent of the total. This was a smaller percentage than on Mission No. 27 when 45 per cent of the encounters resulted from coordinated attacks, but still represents an increase over

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Mission No. 15 (18%), and shows evidence of increased planning and teamwork in the SINGAPORE area during recent months. 13 attacks were made by elements of two enemy fighters, one by an element of three and the remaining attack by five enemy fighters. For the most part, no new or unusual tactics were employed by the Japanese, and attacks were not closely pressed. Two coordinated attacks, however, were different in some respects than those encountered by B-29's to date and are described in the following paragraph.

b. Two single engine fighters (OSCARS or ZEKES) attacked in line astern from 1 o'clock high. It looked like a typical high frontal attack until one of the fighters broke off, still some distance out, and slipped and skidded in a possible attempt to draw fire from the center of the formation. One crew reported that two 20mm wing guns were firing as it slipped off to the side. The other fighter kept coming in, and before breaking off at about 250 yards dropped an aerial bomb near the formation. No claims were made against the enemy aircraft nor was damage from the attack reported by the B-29. The second coordinated attack was executed by five OSCARS, and described as a "strafing" attack. The enemy fighters circled high above the formation and when reaching a position between 10:30 and 11 o'clock nosed down toward the formation and sprayed it with gunfire. Each OSCAR attacked once (one dropping aerial bombs in addition to shooting), opened fire at 1500 yards and closed to about 400 yards before peeling off to a breakaway. One B-29 reported damage to a prop governor from enemy gunfire. There were no claims against the OSCARS.

7. RAMMING ATTACKS

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

8. ROCKETS: None.

9. EVASIVE ACTION

Three of the four Groups participating reported no evasive action taken against enemy aircraft. The fourth Group reported closing and shifting one formation in order to uncover guns.

10. NEW WEAPONS

a. A TOJO was reported by one crew to have fired at them with possible off-set wing guns. The enemy plane flew parallel to the formation, level and to the right rear, and while about 2000 yards out, appeared to fire with off-set guns. No damage was inflicted on the B-29's. TOJO then moved ahead, gained altitude, turned and attacked the formation frontally with a normal firing attack.

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11. NEW OR UNUSUAL TACTICS

a. Crews reported that a great many Japanese pilots half-rolled at the point of breaking away and kept their bellies exposed as they dived. This maneuver in the breakaway has not been common with enemy pilots in the experiences of B-29 crews in such quantity.

b. The dive-bombing technique (mentioned in a previous section) in some cases involved almost vertical dives by enemy fighters from above B-29 formations.

12. NEW AIRCRAFT

Two observations of previously unencountered Japanese fighters were reported. The first was described as shaped like a VAL but with retractable landing gear and a wing span estimated at 50 feet. The second had a thick, round tapered fuselage, retractable landing gear, radial engine and severely swept-back wings. The fuselage tapered sharply to a pointed tail. No further descriptive details were observed.

13. ATTACKS AGAINST FORMATIONS

A study of attacks on various positions within the formations showed that they were well scattered. While examination indicated that some formations had heavier attacks on one side or the other the average indicated no preferences for Japanese pilots. High planes and elements showed a slightly heavier number of attacks but this is believed to have been caused by the over-large number of high approaches, particularly in aerial bombing attacks. The differences, however, were too slight to be of appreciable significance.

14. CLAIMS AGAINST ENEMY AIRCRAFT

Following are details of combat on preliminary claims of 3 destroyed, 4 probably destroyed and 14 damaged.

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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)
TOJO	Destroyed	4	11 high	500	300
TOJO	Destroyed	10	10 level	900	300
ZEKE	Destroyed	10	9 low	1000	600
TONY	Prob Dest	3	11 low	1000	550
S/E	Prob Dest	11	10 high	800	300
ZEKE	Prob Dest	11	10 high	1000	200
TOJO	Prob Dest	5	8 low	800	500
TOJO	Damaged	3	3 high	900	450
TOJO	Damaged	4	8 level	900	900
OSCAR	Damaged	4	11 high	800	500
VAL	Damaged	10	6 level	500	500
OSCAR	Damaged	4	2 high	600	400
TOJO	Damaged	4	1 high	1000	800
OSCAR	Damaged	11	12 high	1500	1500
S/E	Damaged	11	11 high	1000	400
OSCAR	Damaged	11	2 high	1000	200
S/E	Damaged	5	10 high	800	300
TOJO	Damaged	5	12 high	800	300
ZEKE	Damaged	5	9 high	1000	1000
VAL	Damaged	10	9 low	1500	500
TOJO	Damaged	19	11 high	900	50

15. SUMMARY

a. Air opposition was rated weak, with 56 of 109 B-29's sustaining 87 single and 15 coordinated attacks, resulting in 121 individual encounters. 119 encounters were in the primary target area, one in the secondary target area and one midway between SINGAPORE and GEORGETOWN. Due to enemy fighter action, one B-29 is missing, two received major damage and five suffered minor damage. Preliminary claims against enemy aircraft were three destroyed, 4 probably destroyed and 14 damaged. The enemy intercepting force was estimated at 65 fighter aircraft.

b. The majority of encounters (39%) originated from the frontal quarter, and the next highest number came from the left side (33%) a distinct change from former tactics. 71 per cent of the approaches were high (an unusually high percentage), 17 per cent were level and 12 per cent were low.

c. Japanese pilots opened fire in 42 per cent of the total encounters (a lower than usual figure) and B-29's opened fire in 95 per cent of the encounters. Enemy pilots were rated with the same degree of aggressiveness as on the previous mission to the same area.

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d. 36 aerial bombing attacks were reported, mostly with phosphorous type bombs, and, all were ineffective. Coordinated attacks were 28 per cent of total encounters, mostly executed by two plane elements.

e. There were no attempts to ram B-29's nor were ^{there} any instances of near collisions. No rocket attacks were reported.

f. A TOJO was reported with off-set wing guns. A possible new type Japanese fighter was reported. It had a thick, round, tapered fuselage, retractable landing gear, radial engine and severely swept back wings.

16. ENEMY AIRCRAFT MARKINGS

<u>Color</u>	<u>Enemy Aircraft</u>	<u>Markings</u>
Olive-drab	ZEKE	Red diagonal stripes on fuselage; red balls on wings.
"	"	No markings observed.
"	ZEKE	No markings observed.
"	TOJOS	No markings observed.
"	TOJOS	Rising sun insignia.
"	"	Red tips on each wing.
"	NICK	Light colored pontoons.
"	"(dark)RUFÉ	
Silver	TOJOS & ZEKES	Red circles.
"	TOJOS & ZEKES	No markings observed.
"	TOJOS	Red stripes on fuselage.
"	OSCARS	Red circles on wings.
Camouflaged	TOJOS, OSCARS & ZEKE 32'S	No markings observed.
Bluish-grey	OSCAR	No markings observed.
Brownish-grey	OSCAR	No markings observed.
Yellow & Grey	TOJO	Yellow fuselage, grey wings.
Grey	ZEKE	No markings observed.
"	OSCAR	Red balls on wings.
Brown	OSCARS & TOJOS	No markings observed.
White	TOJO	No markings observed.
Color Unreported.	ZEKE 32	Red wing tips on underside.
"	TOJOS	Red stripes across bright green wings.

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ANNEX

D

WEATHER INFORMATION

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

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* * * * *
*   Prepared by:   *
*                 *
*   Weather Section *
*                 *
*   XX Bomber Command *
* * * * *
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DECLASSIFIED
Authority *now* 760063
By *CD* NAPA Date *12/1/88*

S E C R E T

I - WEATHER INFORMATION

Mission No. 33

1 February 1945

	AS FORECAST	AS ENCOUNTERED
BASE AT TAKE OFF	Scattered cirrus at 25,000'. Visibility 7 miles.	KHARAGPUR: 4/10 altocumulus at 8000' which dissipated during take-off. Visibility 7 miles. Wind SE 10. PIARDOBA: Clear. Visibility 6 miles in haze. Wind SE 9. CHAKULIA: Clear. Visibility 7 miles. Wind SE 6. DUDEHKUNDI: Clear. Visibility 10 miles. Wind SE 7.
ROUTE OUT	BASE TO 14 DEG N: Scattered cirrus at 35,000'. Few scattered altocumulus at 10,000' from base to Bay of Bengal. 14 to 6 DEG N: 8/10 small cumulus, base 2500' top 5000'. Cirrus will increase to 8/10 south of 12 deg N. 6 DEG TO TARGET: Patches of scattered altocumulus at 11,000' in addition to persisting cirrus and small cumulus.	BASE TO 14 DEG N: Clear. 14 TO 6 DEG N: Scattered cirrus at 20,000'. Scattered altostratus at 10,000'. Scattered small cumulus with tops at 3-5000'. The middle cloudiness increased south of 12 deg and in the region of 10-11 deg N, a small convergent zone was encountered. The cirrus became broken and the altostratus broken to overcast with the cumulus tops building up to 12,000'. Moderate turbulence and light rain showers were encountered. South of 9 deg, the cirrus and altostratus became scattered and the cumulus dissipated to 4/10 with tops at 4-7000'. 6 DEG TO TARGET: 8/10 cirrus at 25,000'. 7/10 - 9/10 patchy altostratus at 7-8000' with 3/10-4/10 cumulus and stratocumulus at 5000'. A few avoidable cumulonimbus were seen with tops reaching to 25,000' to 30,000'. At assembly point, there was high broken cirrus and 4/10 stratocumulus. From there to target the thunderstorm activity was infrequent.
TARGET AREA	9/10 cirrus at 30,000'. Large patches of altostratus covering 6/10 at 11,000'. 3/10 stratocumulus, top at 5000'. Total average effective cloud cover below flight altitude 7/10. Pressure at target: 29.83 in.	PRIMARY TARGET: 8/10 cirrostratus at 25,000'. 5/10 altocumulus at 10,000'. 3/10 stratocumulus at 5000'. A few cumulonimbus were visible, but none were in the target area. The total effective cloud cover below flight level was variable, but averaged about 5/10. Visibility was unrestricted. SECONDARY TARGET: Scattered cirrus at 20,000'. 1/10-3/10 altocumulus at 7-10,000'. Visibility unrestricted.
RETURN ROUTE	Moderate increase in cumulus along east coast of Malay Peninsula, and slight decrease in cloudiness over water. No other changes.	Broken cirrus at 25,000' to 6 deg N, becoming scattered at 15 deg N and dissipating thereafter. There were 4/10-6/10 cumulus and stratocumulus with tops to 7000' along the Malay Peninsula. Thunderstorm

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	As Forecast	As Encountered
		activity was visible over Sumatra. In the region of 9-10 deg N, the cumulus tops built up to 8000'. North of 12 deg it became clear below 25,000'.
BASE ON RETURN	Clear and unrestricted.	<p><u>KHARAGPUR:</u> Broken altocumulus at 7000'. Visibility 4-7 miles in haze. Wind shifted from south 13 to north 17.</p> <p><u>PIARDOBA:</u> Broken stratocumulus at 5500'. Visibility 5 miles in haze. Wind NNE 20.</p> <p><u>CHAKULIA:</u> Scattered altocumulus at 8000' and lower scattered cumulus at 4000'. Visibility 6 miles in haze. Wind ENE 15.</p> <p><u>DUDHKUNDI:</u> Scattered altocumulus at 12,000' and variable scattered to broken stratocumulus at 5000'. Visibility 6 miles in blowing dust. Wind NE at 15 with gusts to 25.</p>

A. WINDS ALOFT - FORECAST

ALTITUDE	BASE TO 18 DEG N.	18 DEG N. TO 12 DEG N.	12 DEG N. TO 6 DEG N.	6 DEG N. TO TARGET
SURFACE	180 deg-06K			
1000'	160 deg-11K	360 deg-12K	90 deg-10K	40 deg-10K
5000'	280 deg-15K	250 deg-12K	100 deg-12K	40 deg-10K
10000'	290 deg-25K	170 deg-20K	140 deg-17K	100 deg-15K
15000'	270 deg-40K	320 deg-22K	100 deg-15K	80 deg-15K
20000'	270 deg-45K	240 deg-30K	120 deg-25K	100 deg-15K
25000'	270 deg-60K	260 deg-45K	110 deg-30K	90 deg-20K

B. WINDS ALOFT - ENCOUNTERED

ALTITUDE	BASE TO 18 DEG N.	18 DEG N. TO 12 DEG N.	12 DEG N. TO 6 DEG N.	6 DEG N. TO TARGET
4000'	190 deg-20K	90 deg-15K	114 deg-11K	
5000'	240 deg-15K			
6000'		250 deg-11K		
8000'		115 deg-15K		
13000'		165 deg-16K		
15000'		120 deg-11K	100 deg-15K	
19000'				113 deg-15K
20000'				95 deg-17K
21000'				90 deg-15K

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S E C R E T

C. TEMPERATURES

AS FORECAST

ALTITUDE	BASE	15 DEG N.	5 DEG N.	TARGET
SURFACE				26 DEG C.
1000'				25 DEG C.
3000'	20 DEG C.	20 DEG C.	21 DEG C.	22 DEG C.
5000'	17 DEG C.	17 DEG C.	18 DEG C.	18 DEG C.
10000'	7 DEG C.	8 DEG C.	9 DEG C.	10 DEG C.
15000'		2 DEG C.	3 DEG C.	3 DEG C.
20000'			-7 DEG C.	-8 DEG C.
25000'				-18 DEG C.

NOTE: Mean temperature surface to 20000' over target: 11 deg C.

AS ENCOUNTERED

ALTITUDE	18 DEG N.	15 DEG N.	8 DEG N.	7 DEG N.	2 DEG N.	TARGET
3000'		22 DEG C.		24 DEG C.		
4000'	20 DEG C.			23 DEG C.		
15000'				6 DEG C.		
16000'			1 DEG C.		2 DEG C.	
19000'						-7 DEG C.
20000'						-8 DEG C.
21000'						-7 DEG C.

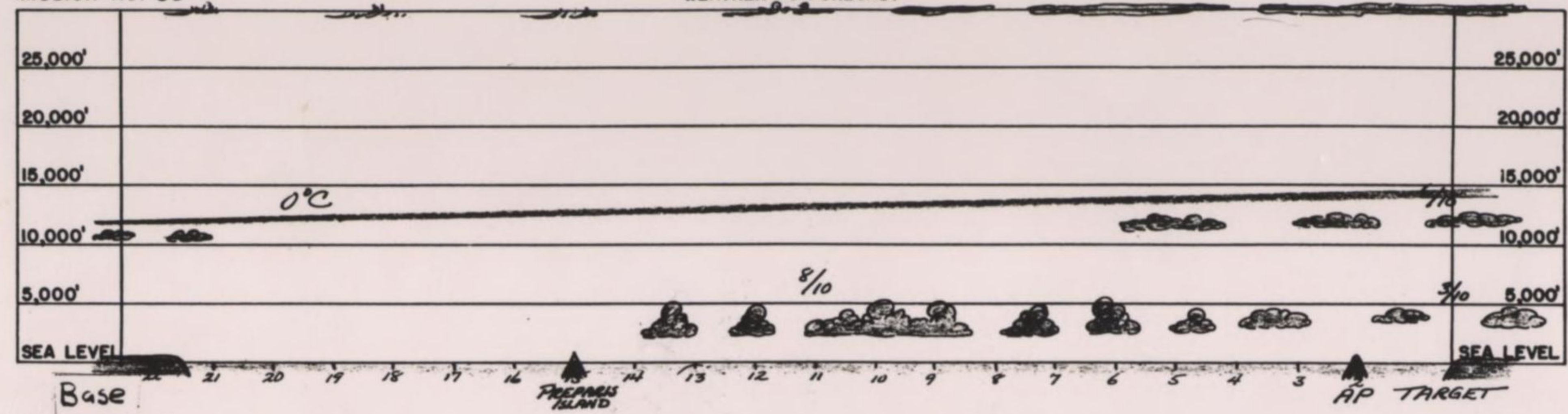
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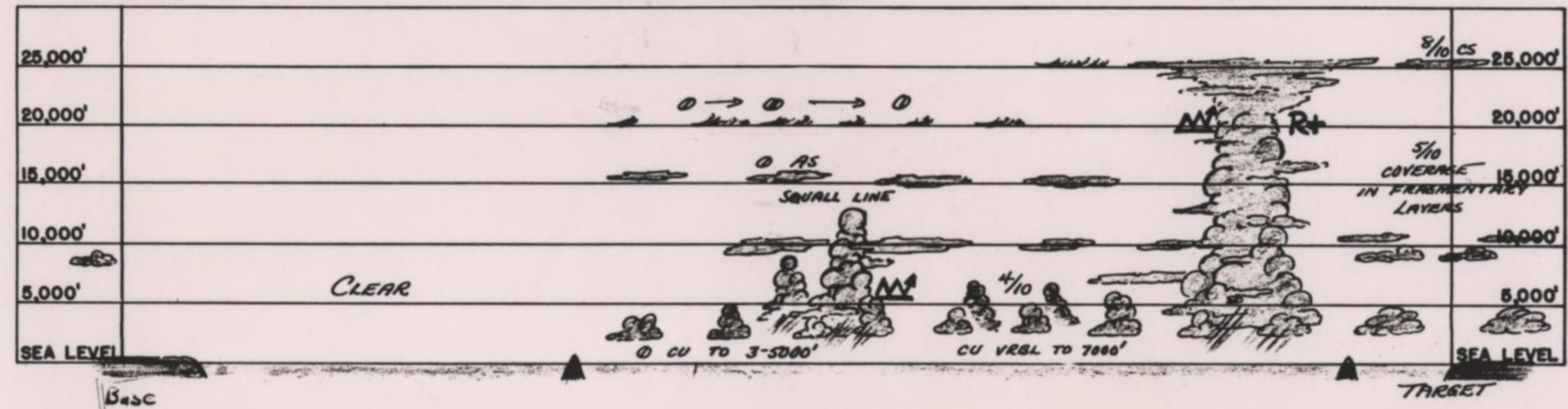
XX BOMBER COMMAND
 WEATHER AS FORECAST

MISSION NO. 33



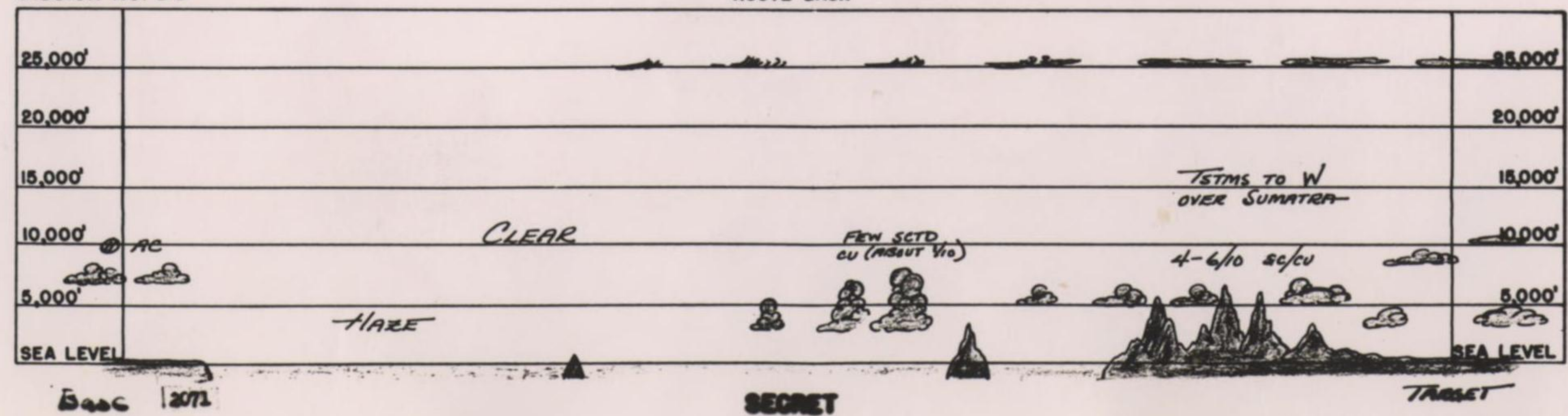
WEATHER AS ENCOUNTERED
 ROUTE OUT

MISSION NO. 33



WEATHER AS ENCOUNTERED
 ROUTE BACK

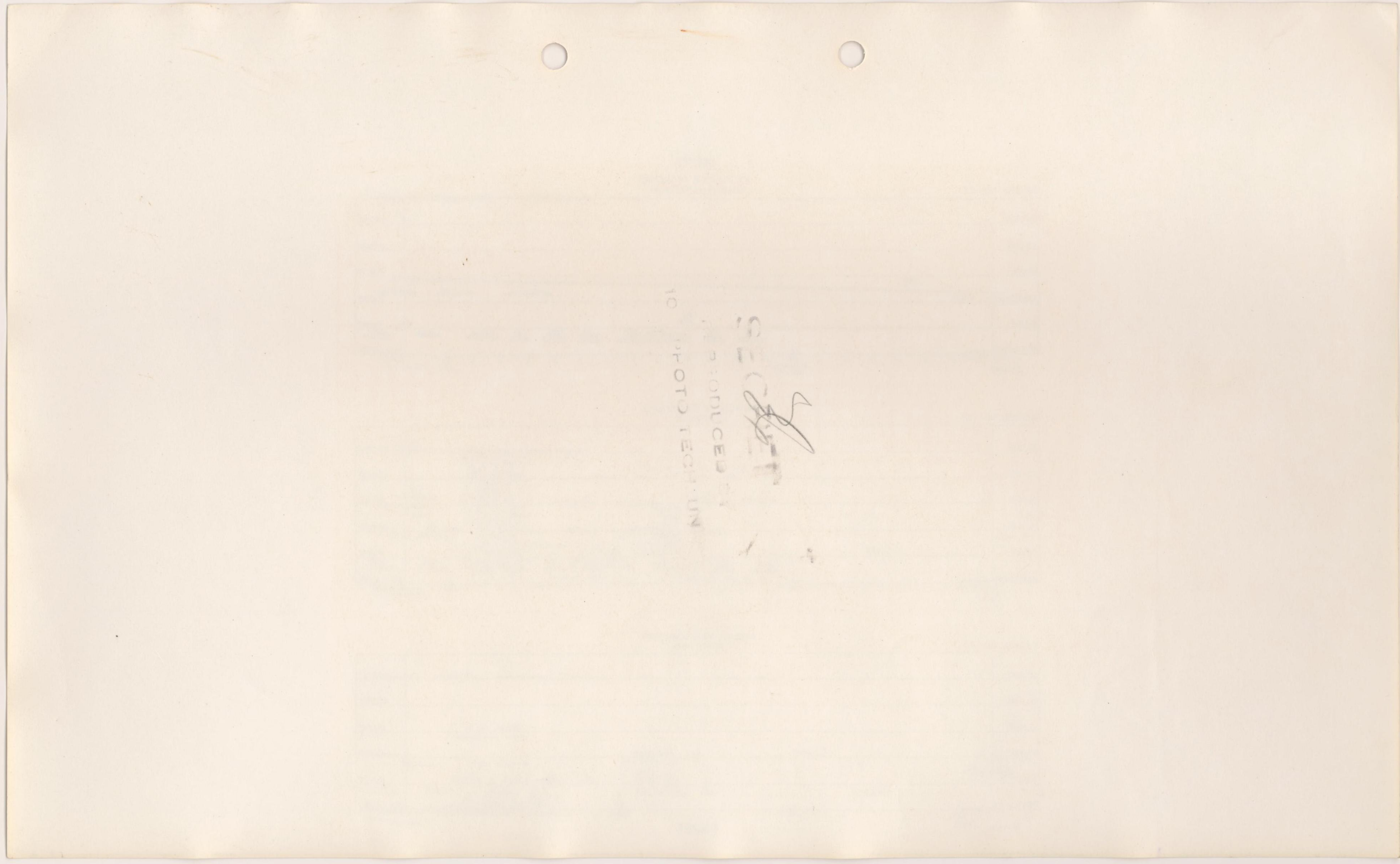
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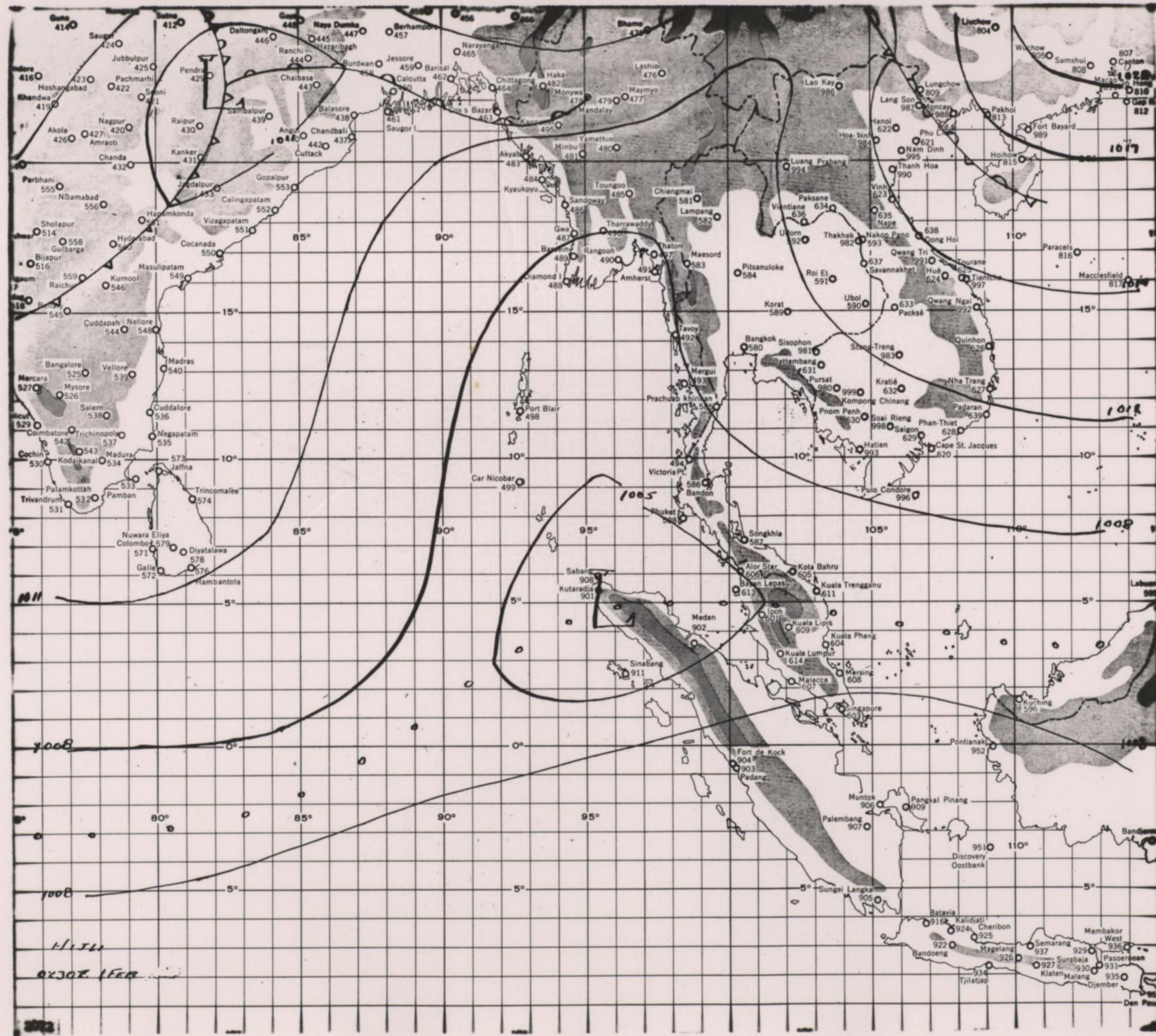
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Base 12071

Target



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ANNEX

E

COMMUNICATIONS INFORMATION

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

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E.O. 11652, Sec. 3(E) and 5(D) or (E)
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By CD/OT NARS, Date OCT 21 1975

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Authority 760063
By CD NAPA Date 12/1/88

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:Auth: CG, XXBC:
:Initials: ZKS:
:Date: 6 Feb 45:
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HEADQUARTERS
XX BOMBER COMMAND
APO 493

CONSOLIDATED
SPECIALIST MISSION
REPORT OF

XX BOMBER COMMAND COMMUNICATIONS (RADIO) OFFICER

Date Prepared: 5 February 1945

Field Order No: 33

Date of Mission: 1 February 1945

PART I

1. Based upon the greatest number of such messages which could be received (i.e., one per aircraft) the following percentage figures indicate the number of aircraft covered by bombs away and position report messages when 400 miles out, which were transmitted by aircraft:

a. Bombs Away:

	<u>40thGP</u>	<u>444thGP</u>	<u>462ndGP</u>	<u>468thGP</u>	<u>Total</u>
No of A/C from which msg could be expected	26	27	27	29	109
No of msgs received	8	9	6	14	37
No of A/C accounted for by messages	23	23	36	45	127
Percentage of A/C accounted for by msgs	88%	85%	133%	155%	116%

- (1) It will be noted that the total number of aircraft accounted for by bombs away messages exceeded the total number from which bombs away messages could be expected by a total of 18 aircraft. This was probably due to aircraft bombing with another Group transmitting bombs away messages, while already having been included in a bombs away message transmitted by the formation leader of the Group with which they were bombing. Airplane commanders must bear in mind that the lead plane of the formation with which they are flying will include all aircraft in the formation in the bombs away message for that formation.

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b. Position reports at 400 miles from base:

	<u>40thGP</u>	<u>444thGP</u>	<u>462ndGP</u>	<u>468thGP</u>	<u>Total</u>
No of A/C from which msg could be expected	25	27	27	29	108
No of msgs received	15	25	21	29	90
No of A/C accounted for by messages	22	27	27	29	105
Percentage of A/C Accounted for by msgs	88%	100%	100%	100%	97%

c. Attack, Convoy Sighting & Abort messages handled:

	<u>40thGP</u>	<u>444thGP</u>	<u>462ndGP</u>	<u>468thGP</u>	<u>Total</u>
Abort Messages	2	1	0	0	3
Attack Messages	2	2	4	5	14
Convoy Sighting Messages	2	2	2	0	6

PART II

2. A resume of distress traffic logged during the mission is as follows:

a. Aircraft 589 of the 40th Group encountered trouble and had to ditch near the target area. The 40th Group ground station did not hear any transmissions from 589, but did receive a message from 3498 which told of trouble that 589 was experiencing and stated that the aircraft was going to ditch. The 444th Group ground station then received a message from 861 of the 444th Group also stating that 589 was in distress and giving its position. Three more aircraft of the 444th Group report hearing 589 attempting to contact the rescue craft, and one aircraft stated the rescue craft was heard calling 589. However, no actual confirmation that communications were established between 589 and the rescue craft were made before 589 ditched. Distress traffic between the rescue craft and 589 was passed on 4475 Kcs, the standard frequency used in contacting US rescue facilities.

PART III

3. One violation of Transmission Security was reported. This violation was made by an aircraft of the 40th Bomb Group when it requested a signal strength check while enroute to the target. While absolute radio silence is not imposed by the Tactical Doctrine, such unnecessary transmissions are strictly forbidden.

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4. One violation of Cryptographic Security was reported by the 40th Bomb Group, which had one aircraft query another as to ETA at rendezvous point in an encoded message. The queried aircraft replied in the clear with a "Q" signal followed by the ETA, the answer thus giving very definite information as to the contents of the coded message.

5. One violation of communications procedures as outlined in the Tactical Doctrine was reported by the 468th Group, in that an aircraft transmitted a bombs away message representing a seventeen-plane formation, when in reality the aircraft was flying in formation with another Group and was not leading the formation.

PART IV

6. Takeoff was at approximately 1700 GMT and frequencies remained in use until approximately 1100 GMT the following day; a total of 18 hours. During this time the average static value remained between a W-1 and W-2 strength with the exception of the hours from approximately 0030 GMT to 0500 GMT during which time the aircraft were flying through local weather disturbances and the static level rose appreciably; in some instances being reported as being at a W-5 level for short intervals.

7. Heavy interference from station LDO at Colombo, Ceylon, was experienced by the 468th Bomb Group on 8260 kilocycles. However, an urgent radiogram to the Theater Signal Officer cleared the channel by 0530 GMT. From information received in answer to a previous interference report, it is possible to state that LDO, a South-East Asia Command station, was operating off frequency. Theater authorities have promised a discontinuance of this off-frequency operation or assignment of a new eight megacycle frequency for the 468th Bomb Group if this interference cannot be remedied.

8. No attempts at jamming or deception tactics on the part of the enemy were reported.

PART V

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

a. Radio 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 (AF)	1200W	19	262	425
Cox's Bazaar (AX)	250W	2	200	250
Chittagong (NR)	1200W	3	220	220
Dum Dum (CM)	3000W	3	204	250
Kharagpur (GK)	1200W	19	356	467
Piardoba (ML)	2000W	24	265	630
Ondal (AQ)	75W	1	150	150

SECRET

b. Radio Ranges:

<u>Location</u>	<u>Power</u>	<u>No of A/C Reporting</u>	<u>Average Initial Contact</u>	<u>Extreme Initial Contact</u>
Dum Dum (CM)	400W	2	375 mi	450 mi
Khargpur(GK)	1200W	5	117 mi	204 mi

c. D/F Facilities: Requests for D/F aid were at a minimum because of good terminal weather conditions. Only the 462nd Group reported having aircraft make use of D/F facilities and no unusual occurrences were noted.

d. Air-to-air homing was utilized as follows:

(1) 40th Bomb Group aircraft did not use air-to-air homing during mission.

(2) 444th Bomb Group aircraft achieved following results:

A/C 464 transmitted homing signals from 0130Z to 0150Z. Four a/c homed from a distance of approximately 50 miles.

A/C 732 transmitted homing signals from 0140Z to 0210Z. Four A/C initially heard homing signals at a distance of 80 miles, but only two achieved successful rendezvous.

A/C 422 transmitted homing signals from 0201Z to 0210Z. Two aircraft homed from a distance of approximately thirty miles.

(3) 462nd Bomb Group had nine aircraft achieve rendezvous with three aircraft which transmitted homing signals from distances varying from 10 to 100 miles.

(4) 468th Bomb Group aircraft did not use air-to-air homing during mission.

PART VI

10. Following malfunctions were reported by various Groups:

a. 40th Bomb Group:

(1) A/C 542 had a radio compass indicator malfunction. Could not be repaired in flight.

(2) A/C 3396 suffered battle damage when flak hit the command set modulator. The VT-136 was broken, but it was replaced in flight and the damage thus repaired.

(3) A/C 3498 experienced trouble with the AN/ART -13 transmitter in that the tuning dials did not return to their proper place when the transmitter was dialed to change frequency.

b. 444th Bomb Group:

(1) A/C 861 had trouble with the needle read reciprocal of its radio compass; cause undeterminable, thus not fixed in flight.

SECRET

- (2) A/C 375 - No sidetone on Collins transmitter; output adjusted in flight. Trailing wire antenna failed to go out; not fixed in flight.
 - (3) A/C 273 - Antenna shorted in liaison receiver; not fixed in flight.
 - (4) A/C 524 - Either the resistor or the capacitor broke down in the interphone; not fixed in flight.
 - (5) A/C 451 - Possible short in circuit in command set; not fixed in flight.
 - (6) A/C 378 - Radar spinner blocked liaison receiver out during flight; cause undetermined.
 - (7) A/C 873 - Interphone dynamotor burned out. Command set fuses continuously blew out.
- c. 462nd Bomb Group:
- (1) A/C 299 - Radio compass antenna broken. Liaison antenna shot off.
 - (2) A/C 904 - Compass antenna down lead broken; fixed in flight.
 - (3) A/C 801 - Fixed antenna lost.
 - (4) A/C 540 - Liaison receiver out; not repaired in flight.
 - (5) A/C 531 - Forward mast of flat top antenna broken.
 - (6) A/C 484 - Compass flat-top broken.
- d. 468th Bomb Group:
- (1) A/C 275 - Interphone shorted out; repaired in flight.
 - (2) A/C 464 - Liaison transmitter would not load up and got excessively hot.
 - (3) A/C 429 - intermittent radio compass.
 - (4) A/C 691 - Bad tube in interphone caused by shorting out of spare jack box.
 - (5) A/C 272 - compass loop base mounting broken; not repaired in flight.

SECRET

- (6) A/C 460 - Radio compass flat top antenna broken due to excessive vibration.
- (7) A/C 417 - All equipment out due to electrical trouble in ship; repaired in approximately one (1) hour.
- (8) A/C 678 - Intermittent liaison receiver; cause undetermined.
- (9) A/C 469 - Interphone shorted out; not repaired in flight.

PART VII

11. A prearranged message, especially included in the Prearranged Message Manual for that purpose was sent from the CP to the Group ground stations for transmission to aircraft, to test the ground to air transmission facilities of this Command. Following results were achieved:

- a. Message consisted of the phrase ZAN ONE TWO and was received for by all Groups, after transmission from the CP at 0048Z.

<u>Group</u>	<u>Initial Transmission</u>	<u>TOR - 1st a/c</u>	<u>TOR last a/c</u>	<u>No of a/c receiving msg</u>	<u>No a/c not receiving ms</u>
40th	0051Z	0053Z	0215Z	23	3
444th	0054Z	0057Z	0207Z	26	1
462nd	0055Z	0056Z	0203Z	24	3
468th	0049Z	0049Z	0148Z	24	5

- b. Total elapsed time to achieve receipt:

<u>40th Group</u>	<u>444th Group</u>	<u>462nd Group</u>	<u>468th Group</u>
1 hr 22 min	1 hr 10 min	1 hr 7 min	59 min.

- c. Average time of transmission (total elapsed time divided by number of aircraft receiving message)

<u>40th Group</u>	<u>444th Group</u>	<u>462nd Group</u>	<u>468th Group</u>
2.5 minutes	2.7 minutes	2.8 minutes	2.4 minutes.

- d. Aircraft not receiving message are accounted for as follows:

- (1) 40th Group: operators of three aircraft did not intercept message.

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- (2) 444th Group: faulty liaison receiver on one (1) aircraft which did not receive message.
- (5) 462nd Group: One (1) aircraft was transmitting honing signals during time message was sent by ground station. One (1) aircraft did not initially hear ground station until after message had been transmitted. Operator of one aircraft did not hear message transmitted.
- (4) 466th Group did not report reasons for non-receipt on the part of the five aircraft which failed to log the message.

S E C R E T

ANNEX

F

RADAR

I - Radar Information*

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

II - Radar Tables*

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

III - Radar Photograph Analysis Charts**

* Prepared by Radar Section, XX Bomber Command

** Prepared by Target Intelligence Unit, XX Bomber Command

S E C R E T

S E C R E T

HEADQUARTERS
XX BOMBER COMMAND
APO 493

.....
.SECRET
.Auth: CG XX BC.
.Initials
.Date 6 Feb 45
.....

CONSOLIDATED
SPECIALIST MISSION
REPORT OF

XX BOMBER COMMAND RADAR OFFICER

Date Prepared 6 February 1945 Field Orders No. 33
Date of Mission 1 February 1945

I - Radar Information

A - Navigation and Bombing

1. Cloud cover in the vicinity of Singapore was about 7/10 undercast, therefore the radar-bombsight procedure was used by practically all the formations. In all cases the release was visual. The excellent results achieved were attributed in great part to the radar bombsight method of bombing.
2. The target was poor as a radar target, however the target area could be clearly seen. In two formations the Bombardier was not able to take over until too late to make sufficient correction. In these cases, however, he was able to aim at the docks in the target vicinity with good success.
3. One aircraft was making a visual run on the secondary target, when the bombsight malfunctioned. Radar took over immediately, and dropped the bombs.
4. The cloud cover over the A.P. and I.P. necessitated the use of radar for assembly and to start the bombrun. Check points were picked up at an average range of forty (40) miles.
5. Radar was of importance in navigating through a tropical front. It was also used to detect severe weather disturbances along the course.
6. Good mapping was obtained, the average being forty-eight (48) miles for 102 aircraft.

B - Scope Photography

1. The scope photography was excellent on the mission. More cameras were installed than on any previous mission (55), and thirty-six (36) sets of useable pictures were obtained. Several camera and radar malfunctions as well as improper operation of the camera reduced the total sets of pictures. Thirty-one (31) sets of pictures traced the bomb run.
2. A faster type film, Class "N", was used in the K-24 type cameras which helped to improve the results. Better operation on the part of the radar operators also accounts for the improvement.

-1-

S E C R E T

S E C R E T

C - Serviceability

1. Serviceability of the radar sets was very good. Of 105 aircraft reporting bombing, 100 or ninety-five (95%) percent were operative over the target. Only two (2) sets completely malfunctioned. Very bad interference from other sets was noted by most operators at the assembly point, and many photographs of it were obtained.

-2-

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II - Radar Tables

A - Bombing

Total A/C Bombing - - - - - 109
 Total A/C Bombing Floating Drydock, Singapore, Visually - 67
 Total A/C Bombing Singapore Naval Base, Visually- - - - - 21
 Total A/C Bombing Georgetown, Visually- - - - - 13
 Total A/C Bombing Georgetown, Radar - - - - - 1
 Total A/C Bombing Georgetown, Blind - - - - - 1
 Total A/C Bombing Martaban, Visually- - - - - 5
 Total A/C Bombing T/O, -Visually - - - - - 1
 Total A/C Bombing by Radar - - - - - 1
 Percent Radar Bombing - - - - - 1

B - Photographic Results

DATA	40th Gp		444th Gp		462nd Gp		468th Gp		Total	
	No.	%	No.	%	No.	%	No.	%	No.	
No. Cameras Inst.	16		9		13		17		55	
K-24 Cameras	4		4		3		9		20	
K-35 Cameras	12		5		10		8		35	
No. Cameras in Abort, Early Return & Missing A/C*	2	13	0	0	0	0	0	0	2	
No. Cameras Completing Mission*	14	87	9	100	13	100	17-c	100	53	8
No. Cameras in Radar & Camera Malfunction A/C#	0	0	2	22	1	8	4	24	7	1
Sets of Pictures Returned#	14	100	5-a	56	11-b	84	6-d	41	36	6
Number Negatives Returned	262		171		206		114		753	
Sets of Pictures Useable**	14	100	5	100	11	100	6	100	36	10
Sets of Pictures Tracing B. Run**	14	100	4	80	9	82	4	67	31	8

- * Percentage based on cameras installed.
- # Percentage based on cameras completing mission.
- ** Percentage based on sets of pictures returned.
- a - Pictures fr A/C No's. 361 and 559 not received to date.
- b - Pictures fr A/C No. 736 not received to date.
- c - Cameras in Ships No's. 208, 471, 525 not used; Camera in Ship No. 275 damaged by enemy action.
- d - Cameras in A/C No's. 529, 469, 487 not used correctly.

S E C R E T

Q - Navigational Ranges

	40th Gp		444th Gp		462nd Gp		468th Gp		Total	
	Number Reporting	Average Range	Number Reporting	Average Range	Number Reporting	Average Range	Number Reporting	Average Range	Total Number Reporting	Weighted Average Range
Mapping Range	26	47	23	47	22	52	26	47	102	48
Singapore (PT)	18	38	24	32	19	27	12	38	73	34
Georgetown (ST)	5	27	6	27	7	42	6	45	24	39
Martaban (LRT)	2	32	1	25	1	26	-	-	4	29
Bassein (T/O)	-	-	-	-	-	-	1	50	1	50
L. Kariomen Island (IP)	14	37	23	38	19	36	13	38	74	37
Roepat Is. (AP)	15	41	13	42	12	42	14	34	56	38
Andaman Island	4	41	13	43	6	46	15	49	38	42
Barren Island	2	50	6	33	2	45	1	50	11	40
Cape Lubdaluba	12	35	3	48	-	-	-	-	15	38
Cape Ru	2	46	4	35	2	50	-	-	8	42
Benckalis Is.	4	44	7	35	-	-	13	34	24	36
Great Coco Is.	-	-	19	34	9	40	16	39	44	38
Katam Island	5	45	2	38	-	-	-	-	7	43
Langkawi Is.	4	50	3	30	-	-	-	-	7	41
Narcondom Is.	5	65	14	33	6	48	9	54	34	46
Pangker Is.	-	-	2	30	2	30	3	70	7	47
Penang Island	-	-	4	36	5	46	7	53	16	47
Port Sweetenham	2	50	7	26	-	-	11	47	20	40
Pucket Island	8	35	3	41	2	45	8	59	21	46
Purian Point	5	47	1	40	-	-	-	-	6	46
Preparis Island	-	-	6	22	8	42	10	46	24	39
Rawi Island	-	-	3	35	-	-	5	60	8	51
Sayer Island	-	-	9	33	9	41	10	46	28	40

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D - Serviceability

DATA	40th Gp		444th Gp		462nd Gp		468th Gp		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
A/C Airborne	28		23		28 ^a		29		113	
A/C Reporting	27		23		25		27		107	
Q-13 Operative Just After Take-Off*	28	100	23	100	24	96	26	97	106	99
A/C Bombing	27		27		27		23		109	
A/C Reporting Bombing*	26	97	27	98	25	100	27	100	105	98
Q-13 Operative Over Target #	25	96	27	100	24	96	24	89	100	95
Q-13 Unrepairable Failures #										
Completely Inop.	0	0	0	0	0	0	3	11	3	3
Partially Inop.	1	4	3	11	3	16	1	4	3	8
Total	1	4	3	11	3	16	4	15	11	11
Q-13 Repaired in Flight	0		2		3		0		5	
SCR-695 Failures*	0	0	0	0	0	0	0	0	0	0

* Based on A/C Reporting.
 # Based on A/C Reporting Bombing.
 a - 5 A/C landed elsewhere.

E - Malfunctions

DATA	40th	444th	462nd	468th	Total
<u>Malfunctions Between T-O & Target</u>					
Completely Inoperative:					
Trans. Would Not Go On	0	0	0	1	1
Excessive Ship Voltage	0	0	0	1	1
Excessive Spoking	0	0	0	1	1
Partially Inoperative:					
Pressure Bad	1	0	0	0	1
Drifting A.F.C.	0	3	0	0	3
No 100-Mile Sweep	0	0	1	0	1
No Blanking on Return Sector Scan	0	0	1	0	1
Doms Retraction Inoperative	0	0	1	0	1
Bad Spoking	0	0	0	1	1
Total Completely Inoperative	0	0	0	3	3
Total Partially Inoperative	1	3	3	1	8
Total Malfunctions Between Take-Off & Target	1	3	3	4	11
<u>Malfunctions Repaired in Flight</u>					
Replaced Bad Inverters	0	2	2	0	4
No Sweep. Replaced F1108	0	0	1	0	1
Total	0	2	3	0	5
<u>Summary, APQ-13 Malfunctions</u>					
Completely Inoperative	0	0	0	3	3
Partially Inoperative	1	3	3	1	8
Repaired in Flight	0	2	3	0	5
Total	1	5	6	4	16
<u>Malfunctions of Aux. Equipment</u>	0	0	0	0	0

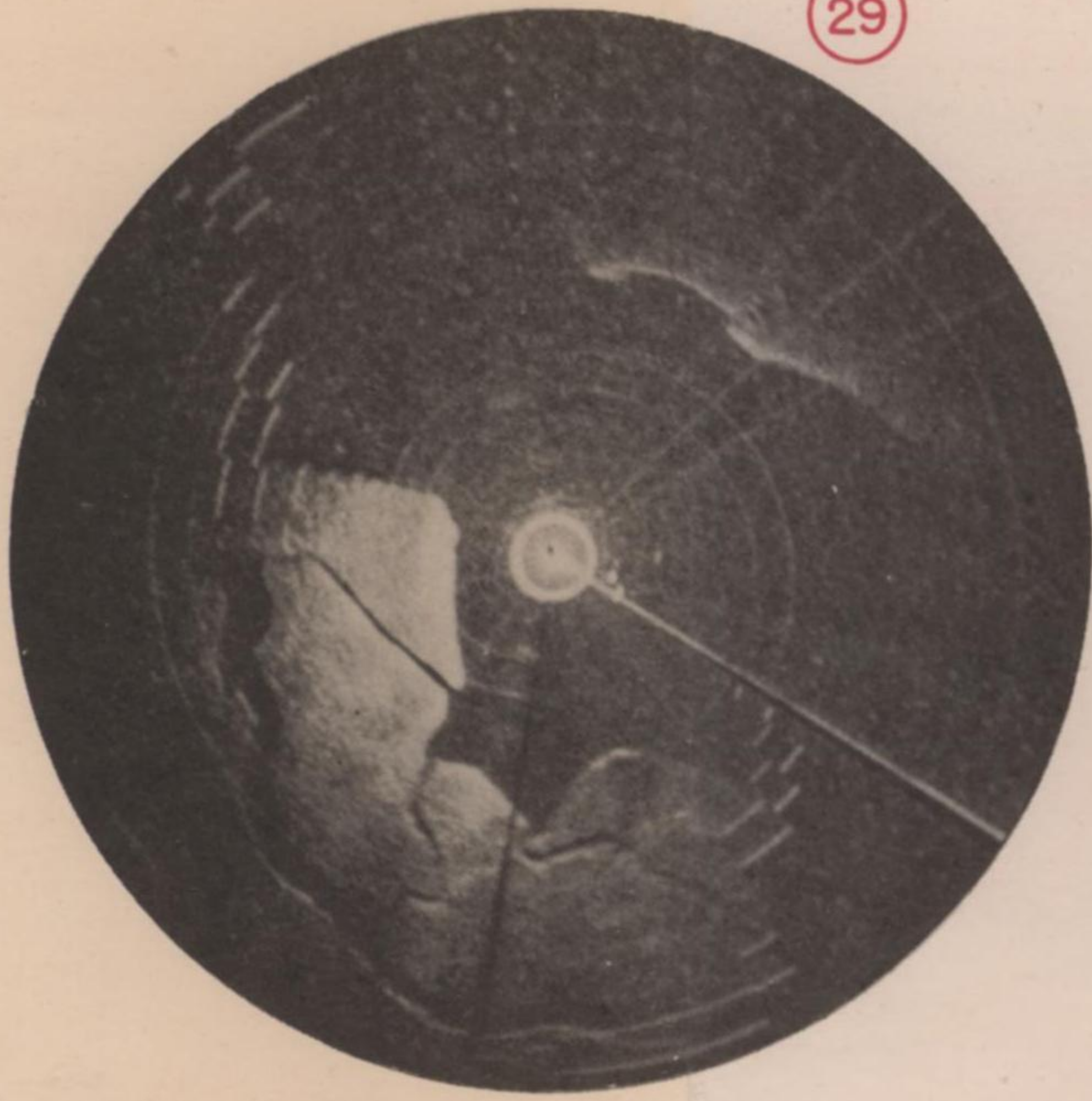
230-1/2/45

ALL ALTITUDES 19,000'. SWEEPS ARE 20 MILES UNLESS OTHERWISE INDICATED.

SECRET

RADAR PHOTOGRAPH ANALYSIS
SINGAPORE AREA - MALAY STATES

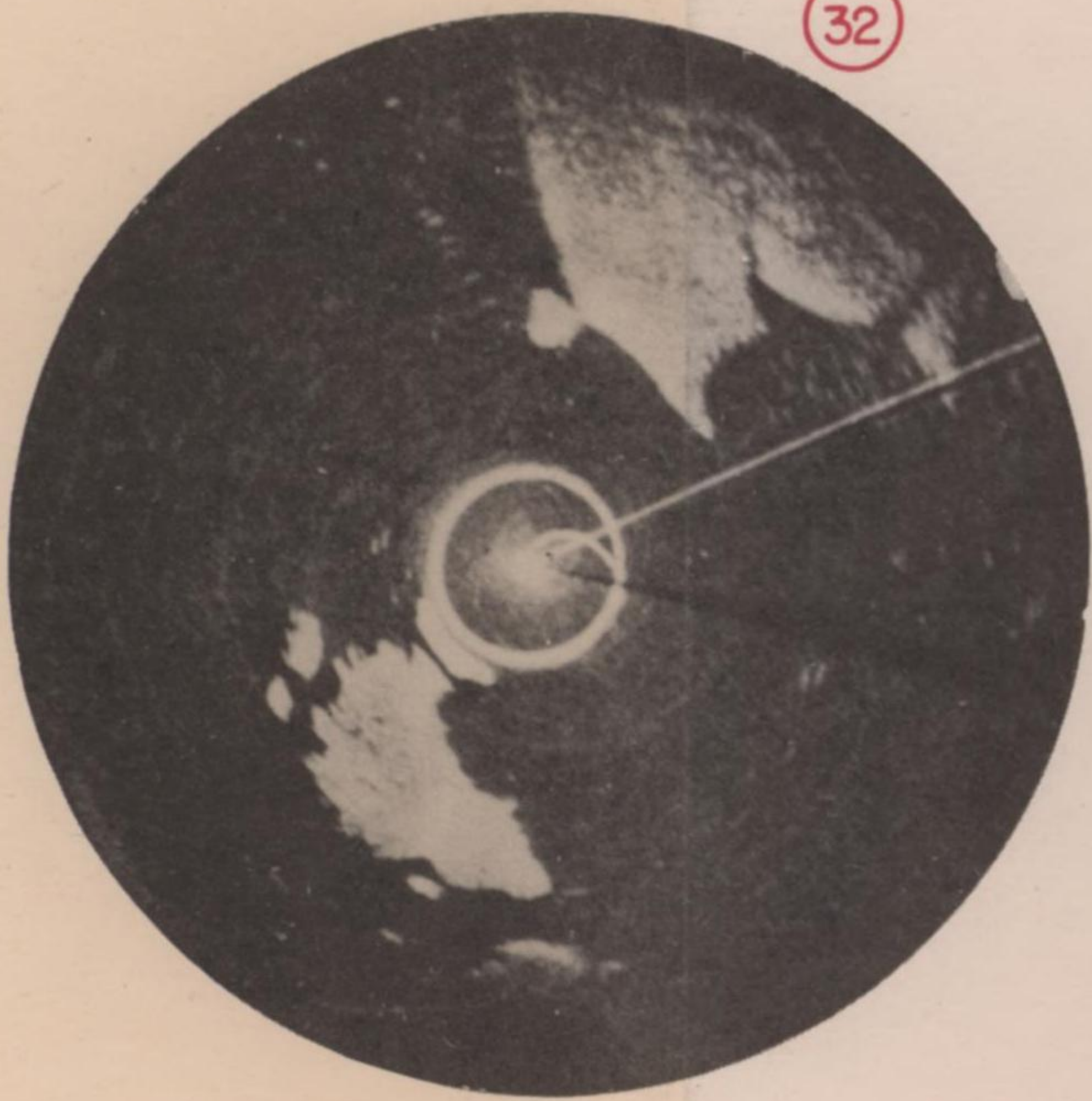
MISSION NO. 33



29

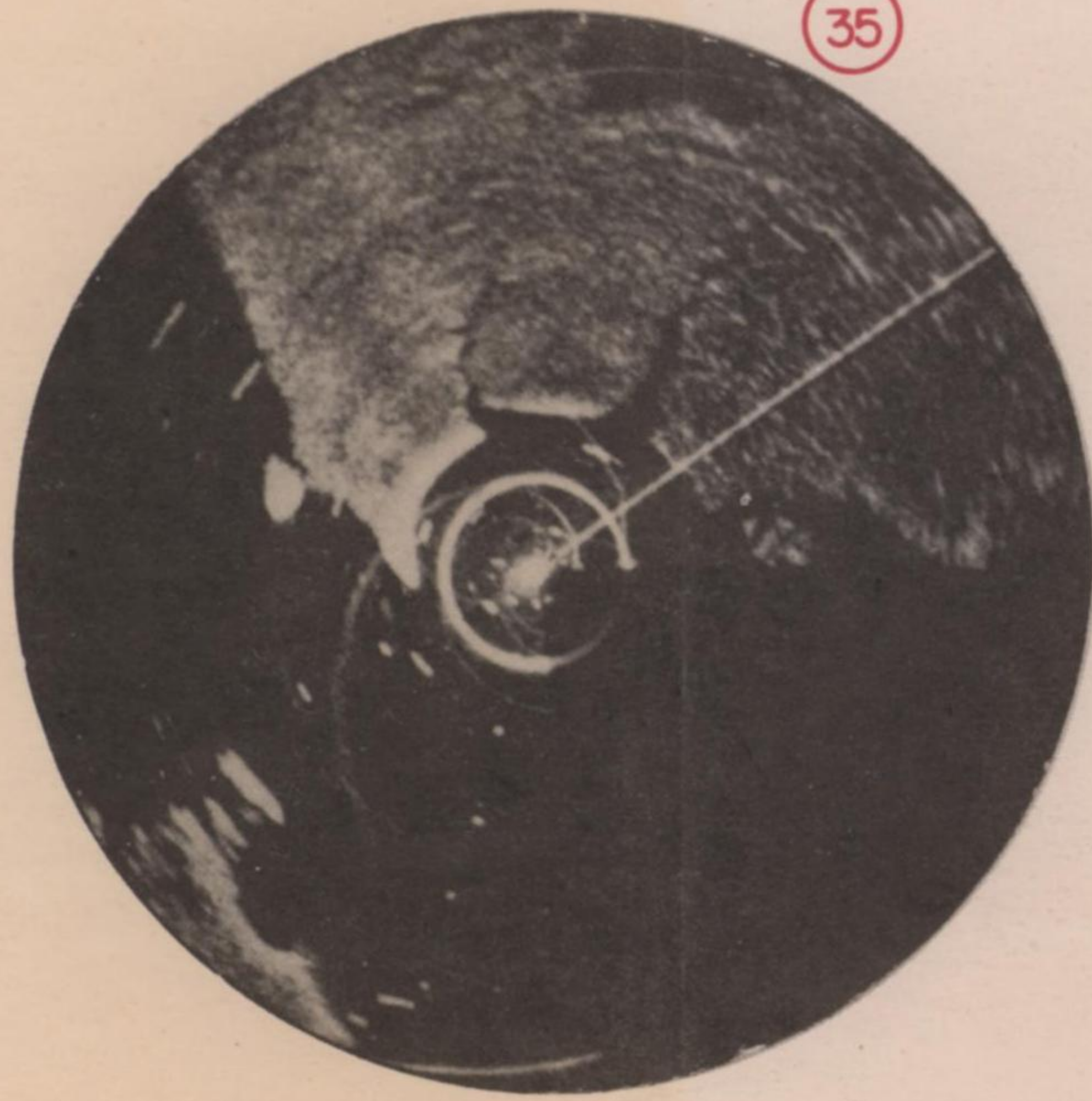
122° MAG.

50 MILE SWEEP



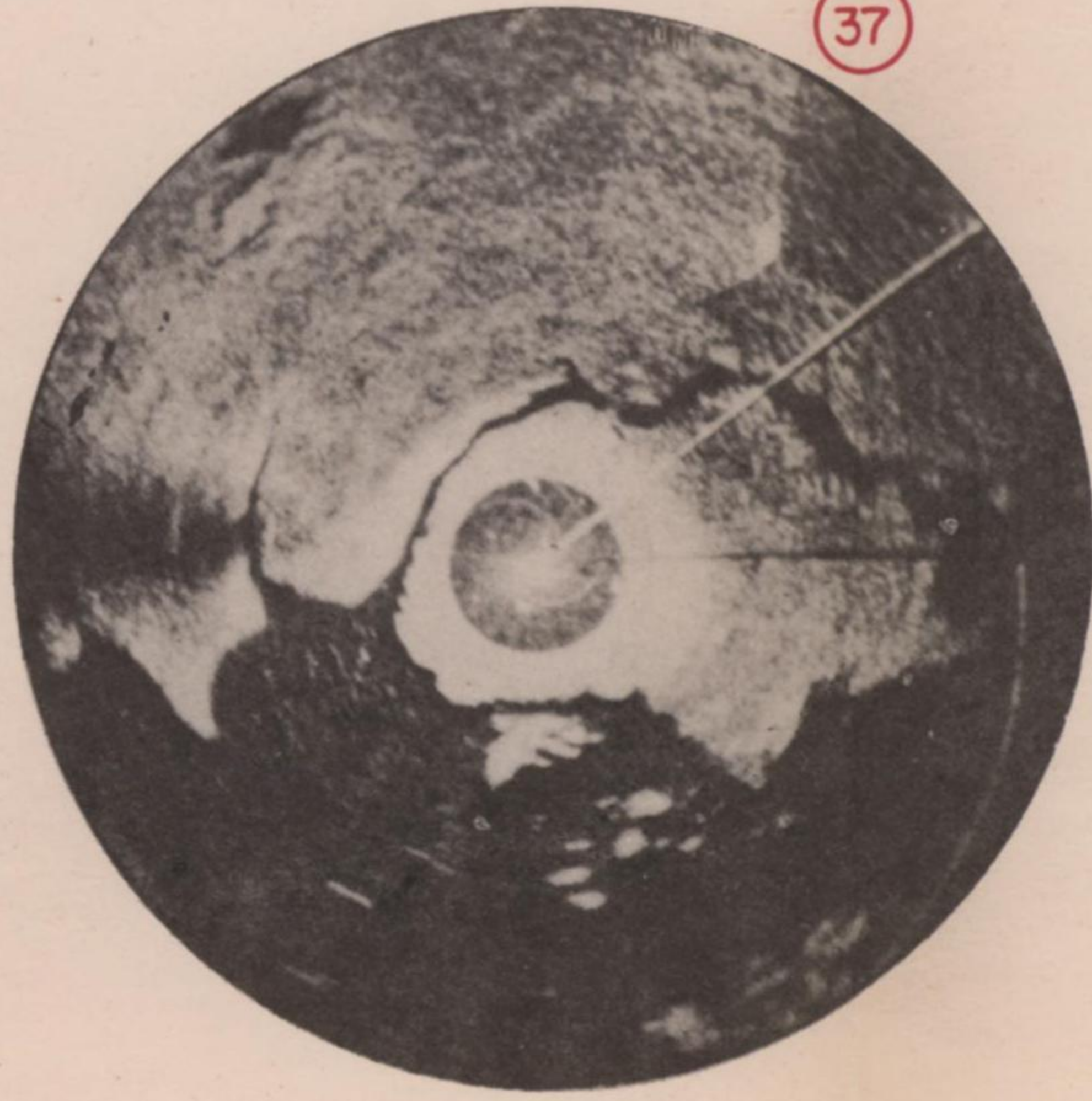
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66° MAG.



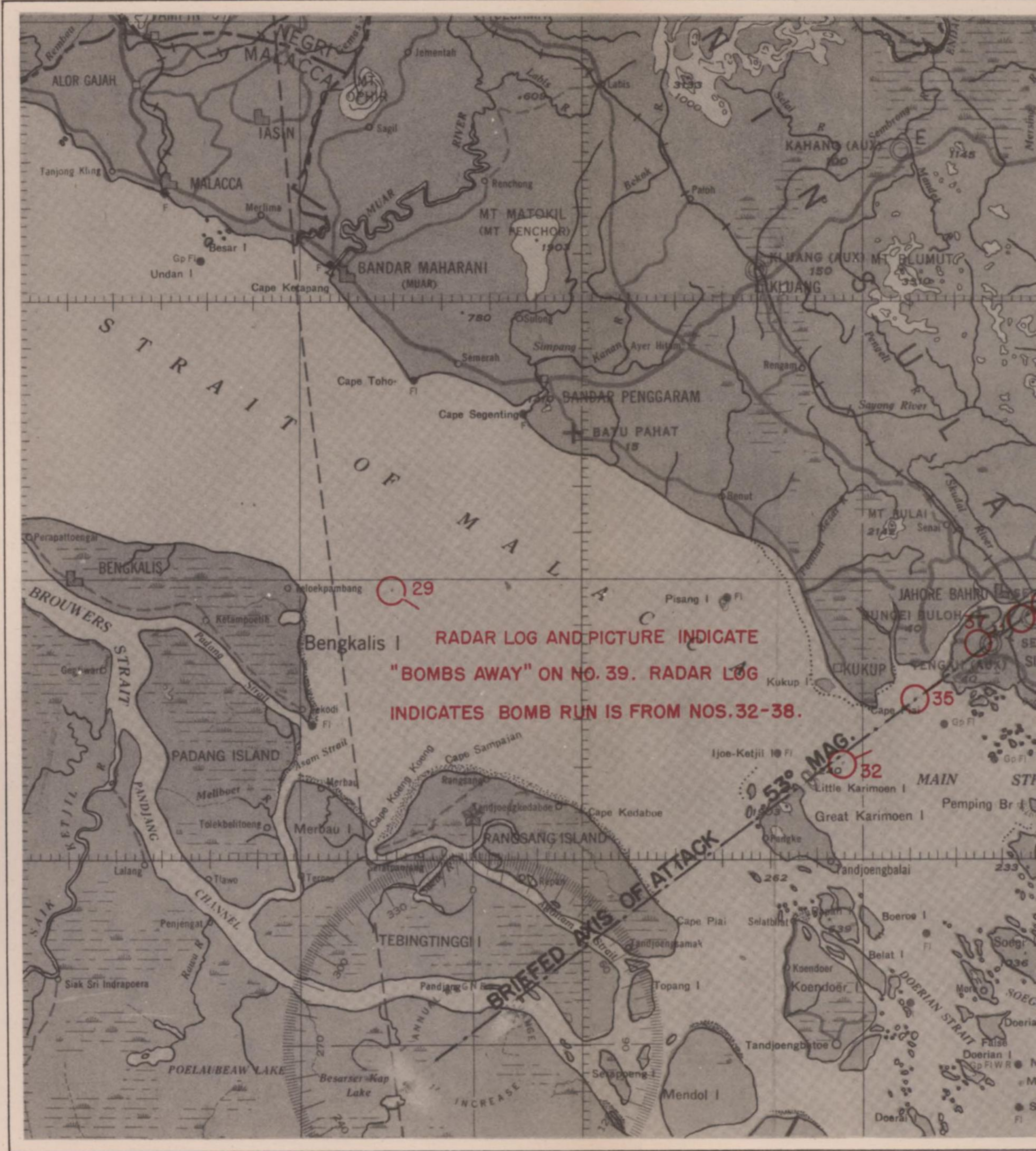
35

55° MAG.



37

52° MAG.



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DECLASSIFIED
Authority *760063*
By *CD* NAPA Date *12/1/88*

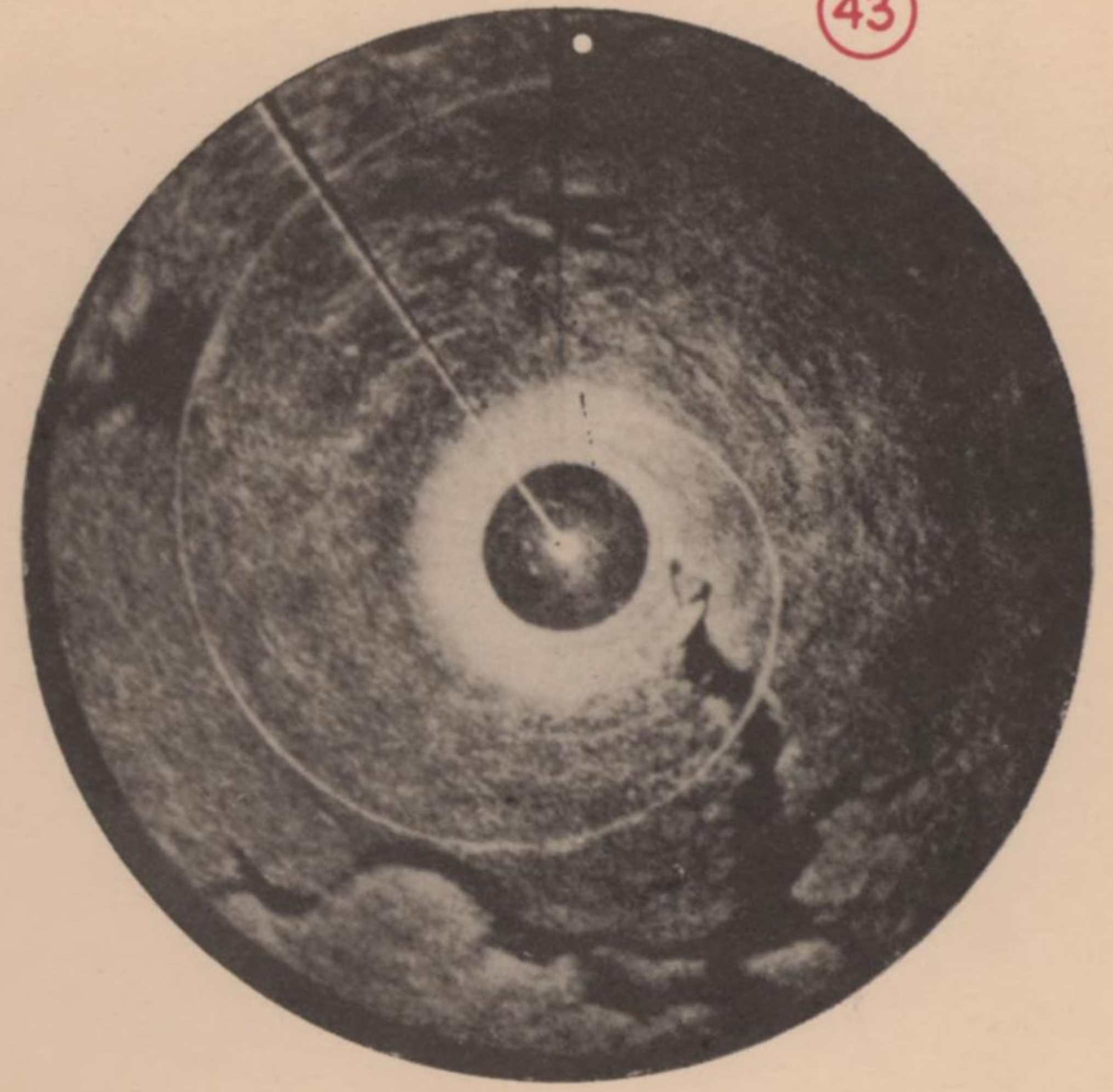
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RADAR PHOTOGRAPH ANALYSIS

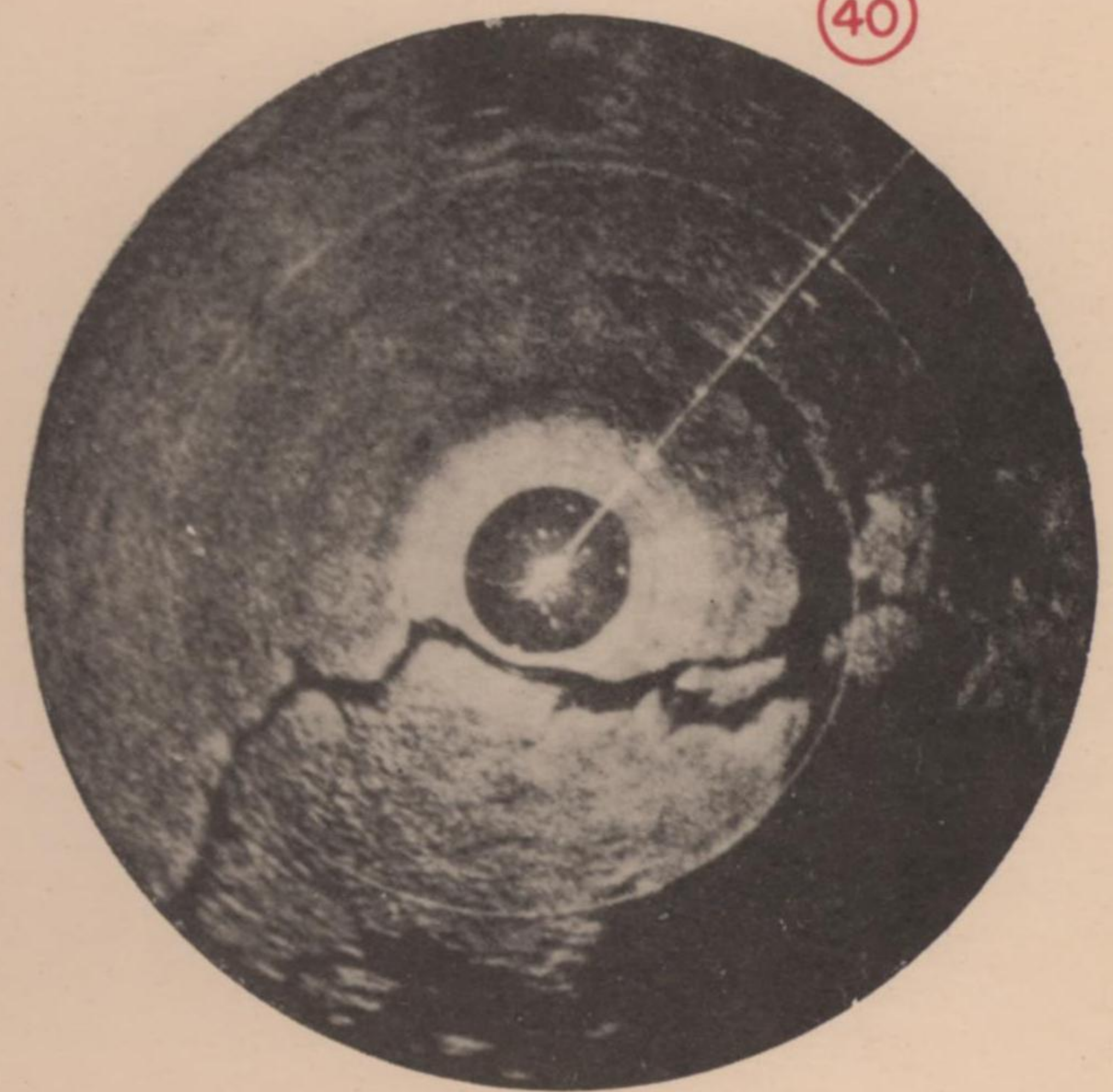
SINGAPORE AREA - MALAY STATES

MISSION NO. 33

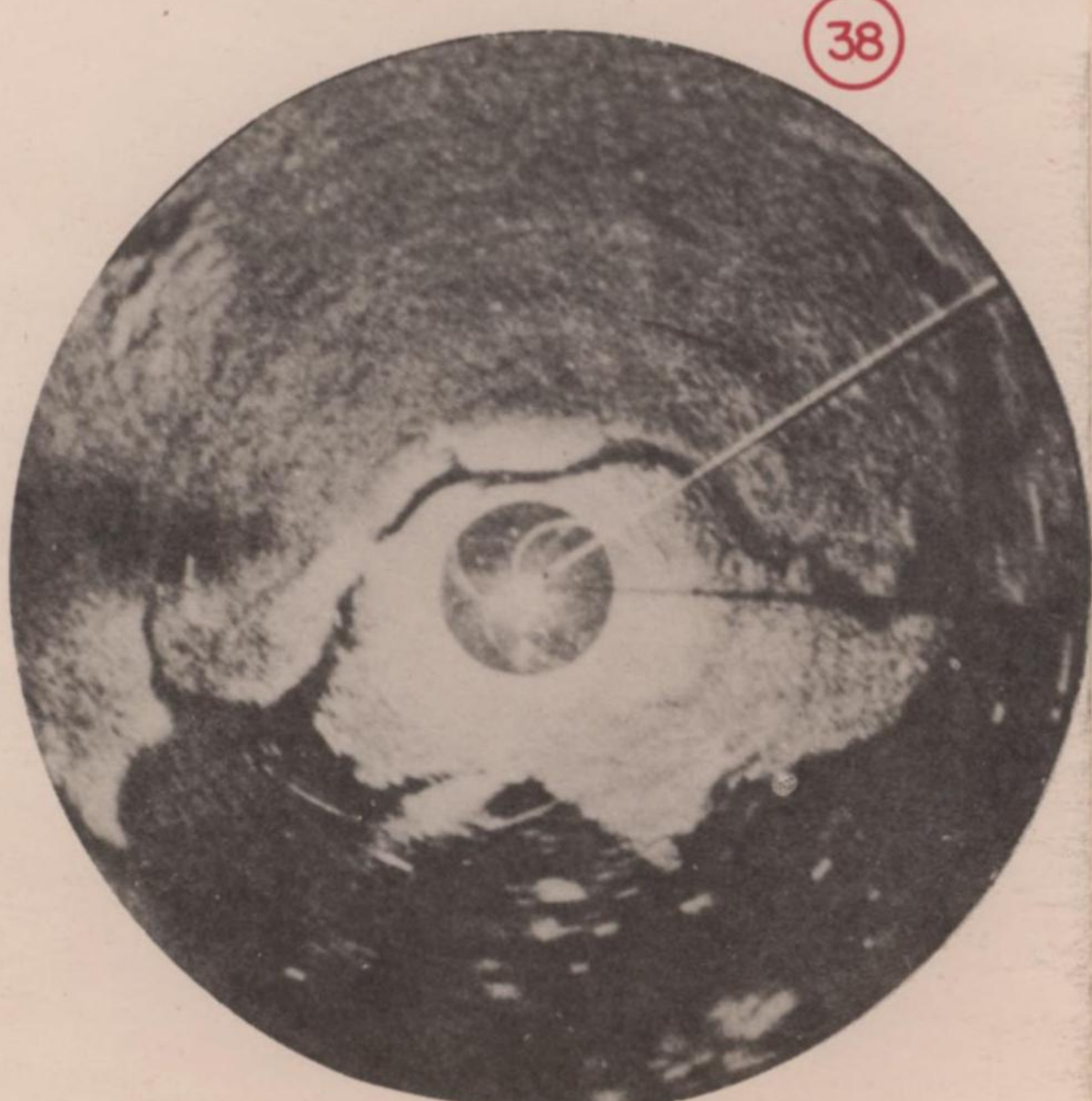
R 92.2-22 SHEET J



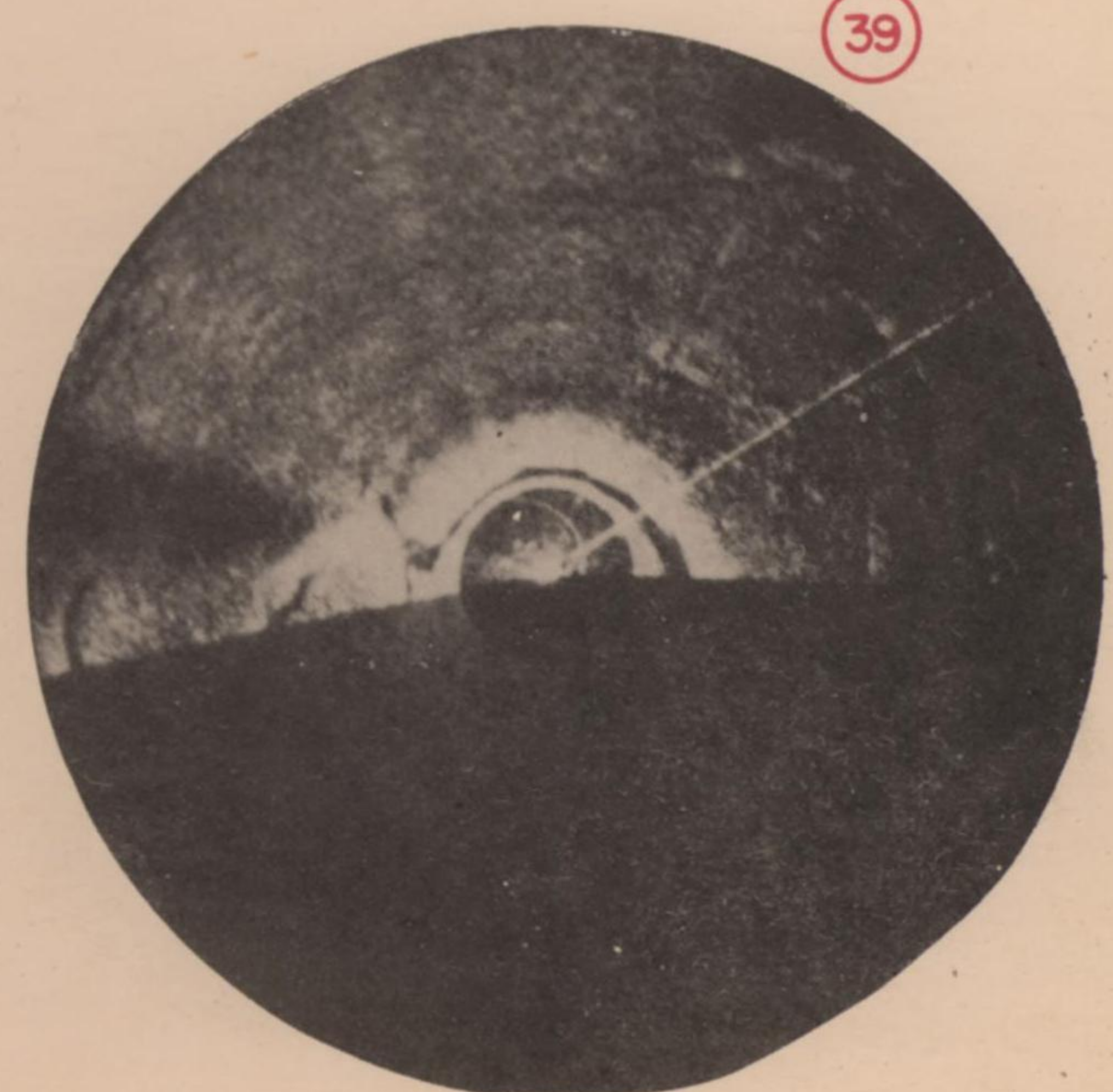
325° MAG.



41° MAG



57° MAG.



57° MAG.

... BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX Bomber Command

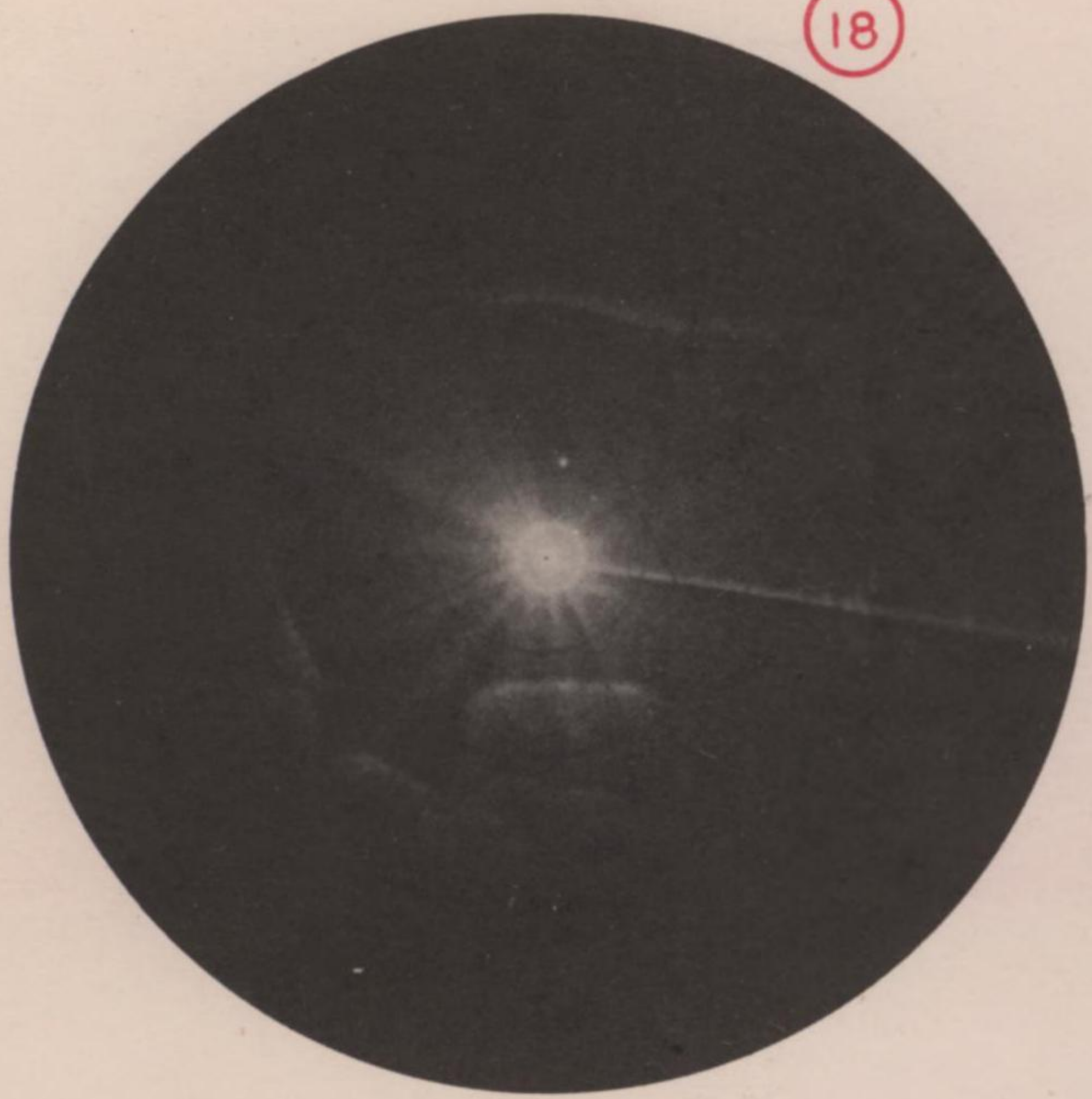
SECRET

DECLASSIFIED
 Authority *now* 7600 63
 By *CD* NAPA Date *12/1/88*

RADAR PHOTOGRAPH ANALYSIS
SINGAPORE AREA-MALAY STATES

MISSION NO.33

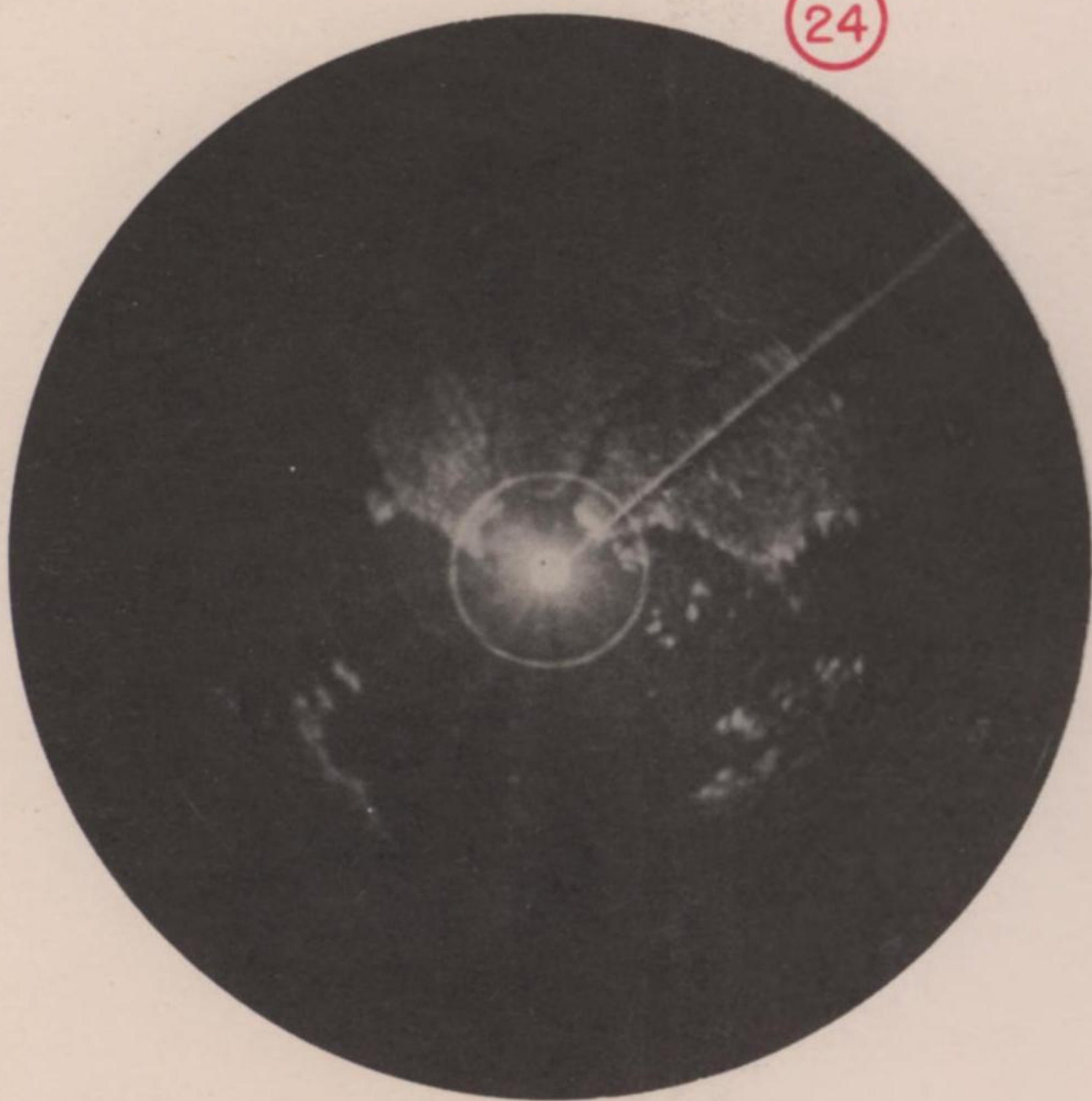
ALL ALTITUDES 20,000'



18

HEADING 98° MAG.

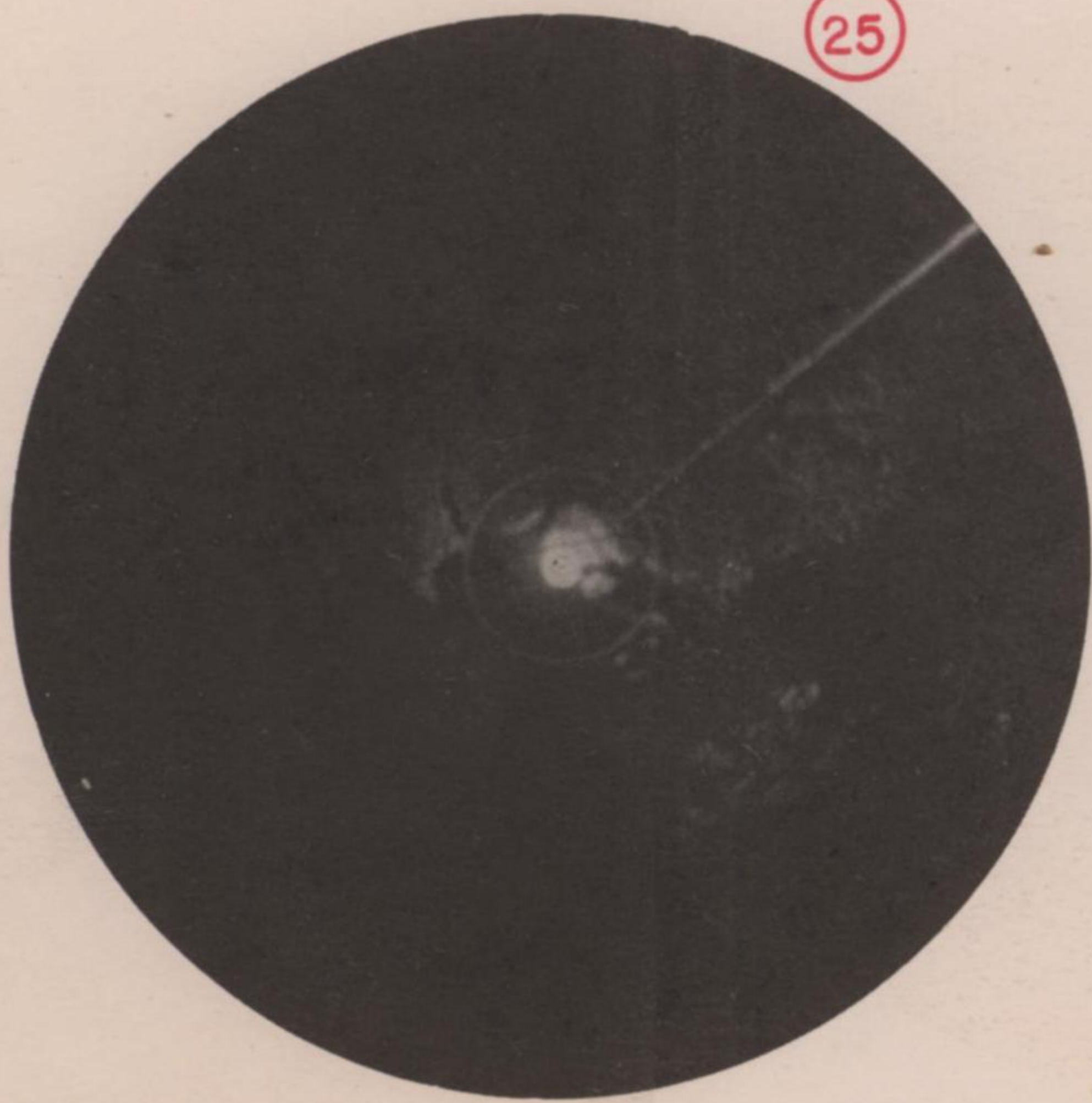
50 MILE SWEEP



24

HEADING 51° MAG.

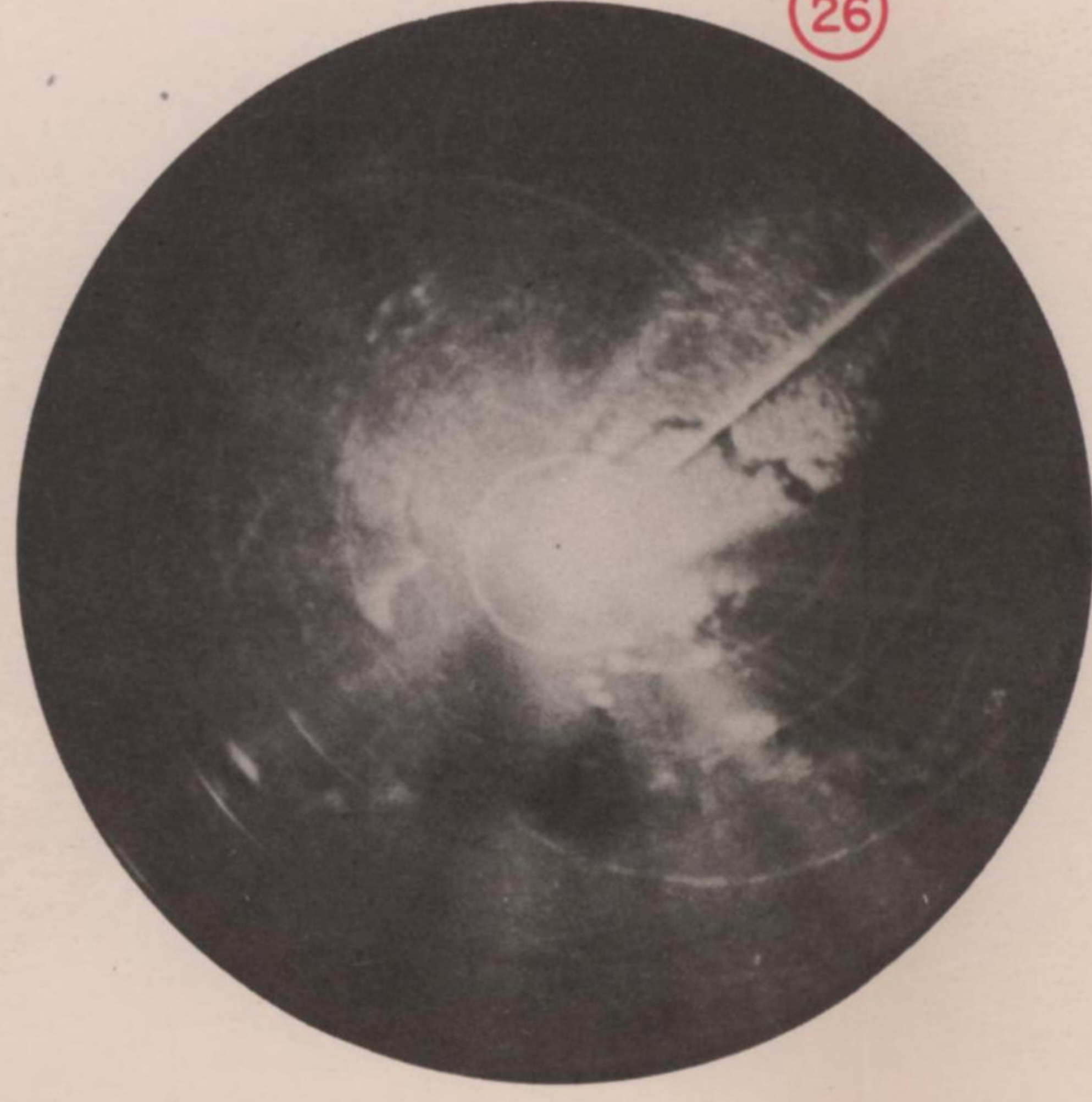
50 MILE SWEEP



25

HEADING 51° MAG.

50 MILE SWEEP



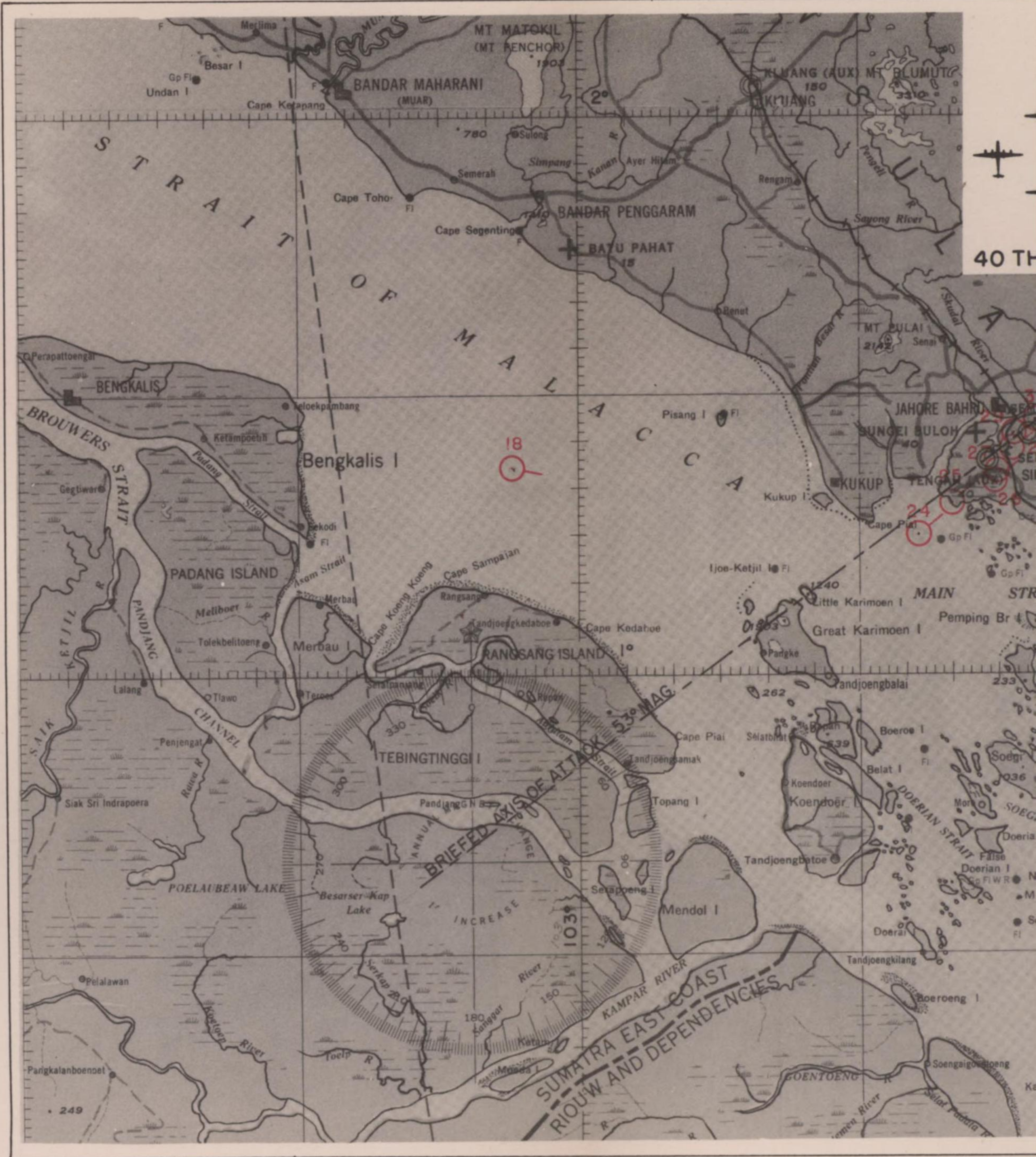
26

HEADING 51° MAG.

50 MILE SWEEP



HEADING 51°



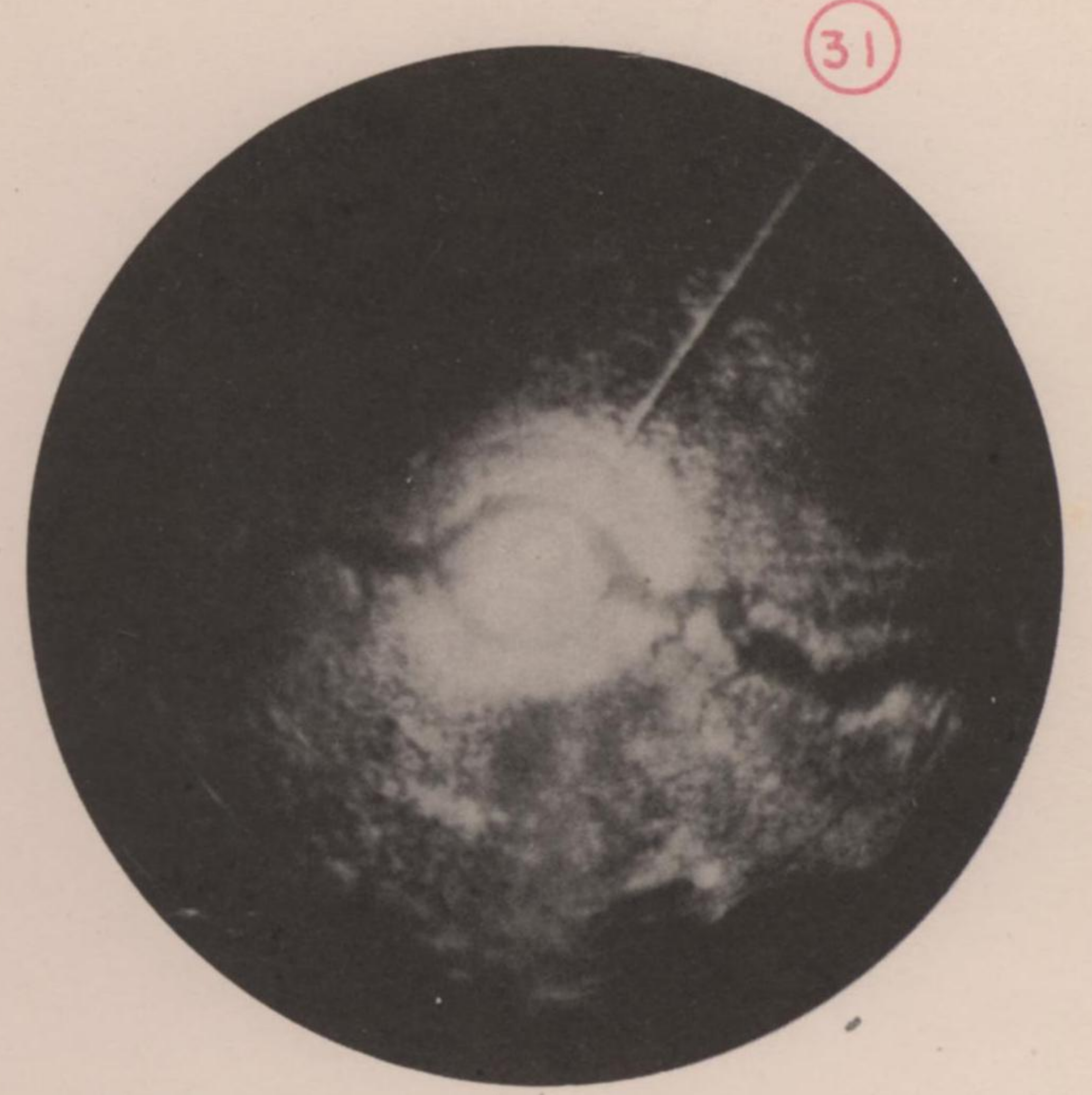
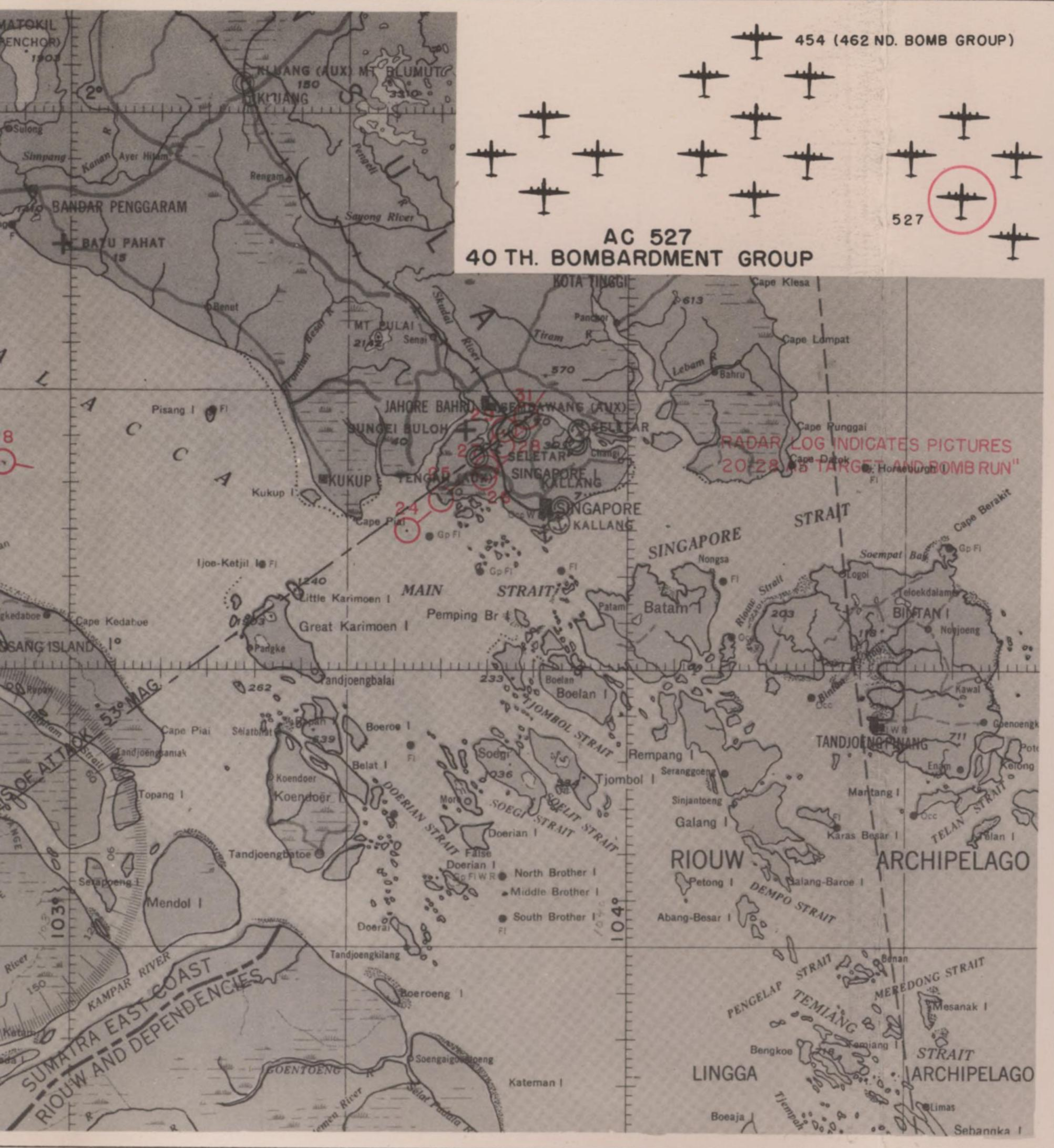
DECLASSIFIED
Authority *760063*
By *CD* WAPA Date *12/1/88*

SECRET

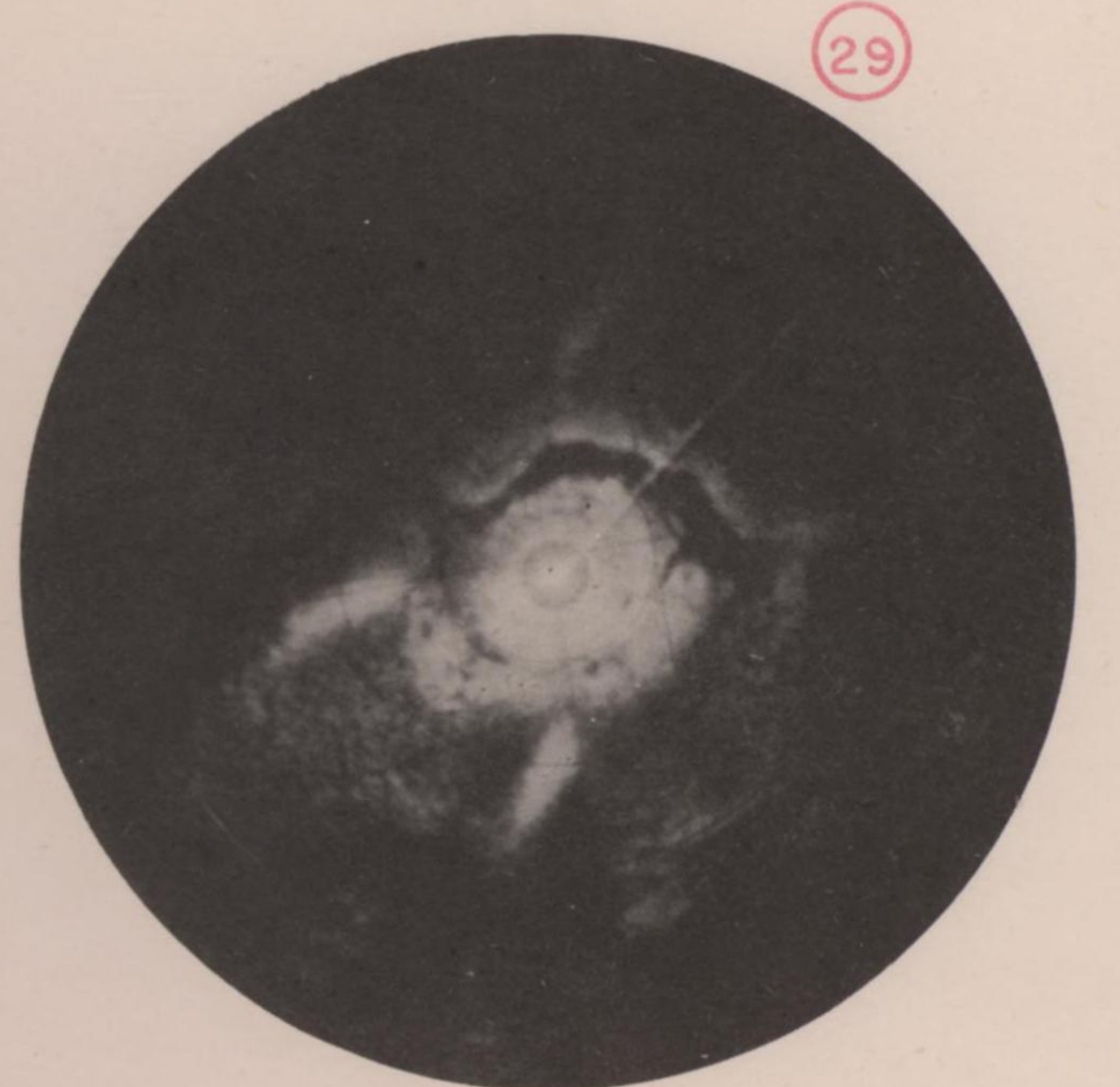
R 92.2-22 SHEET K

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MISSION NO.33



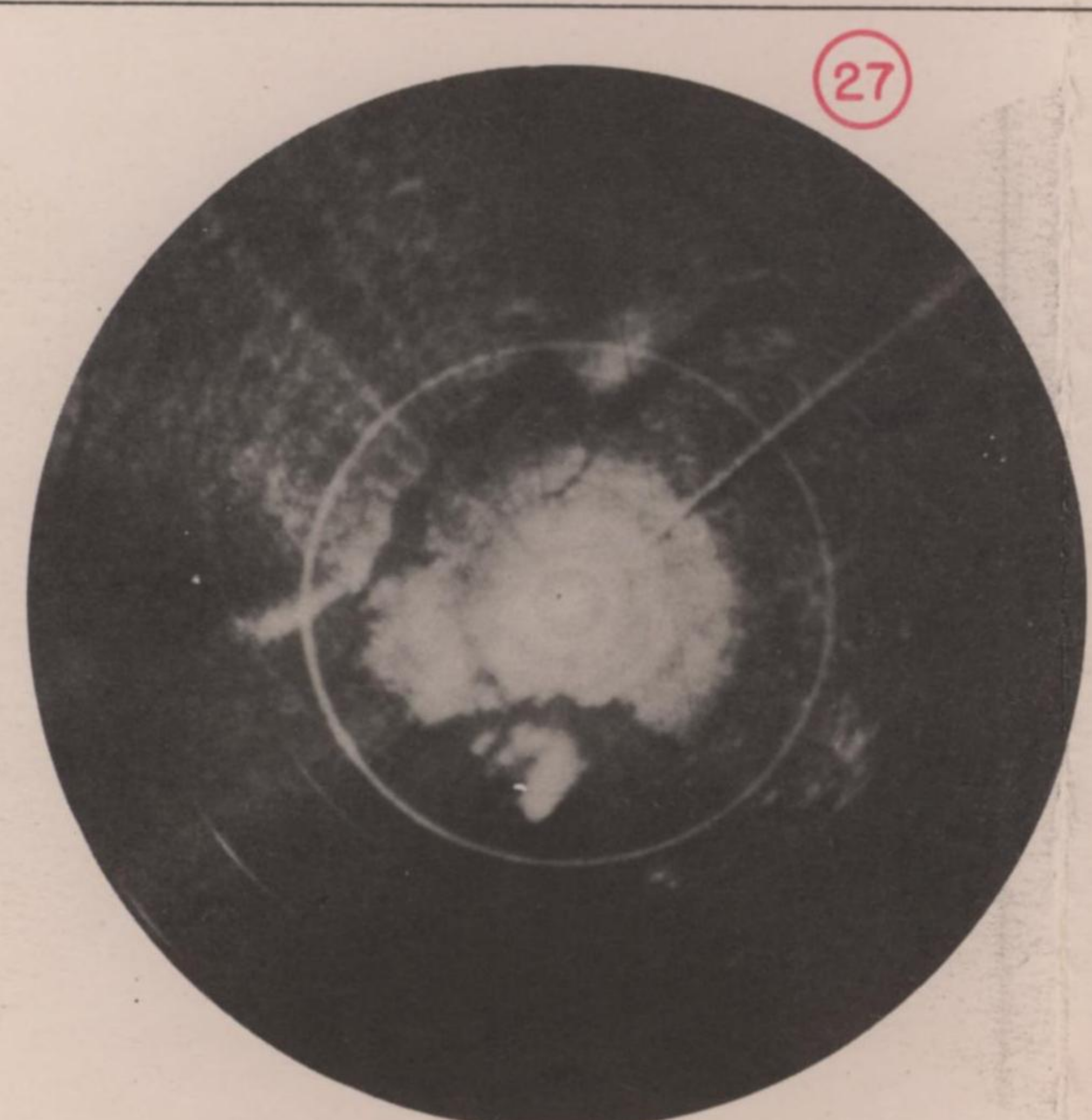
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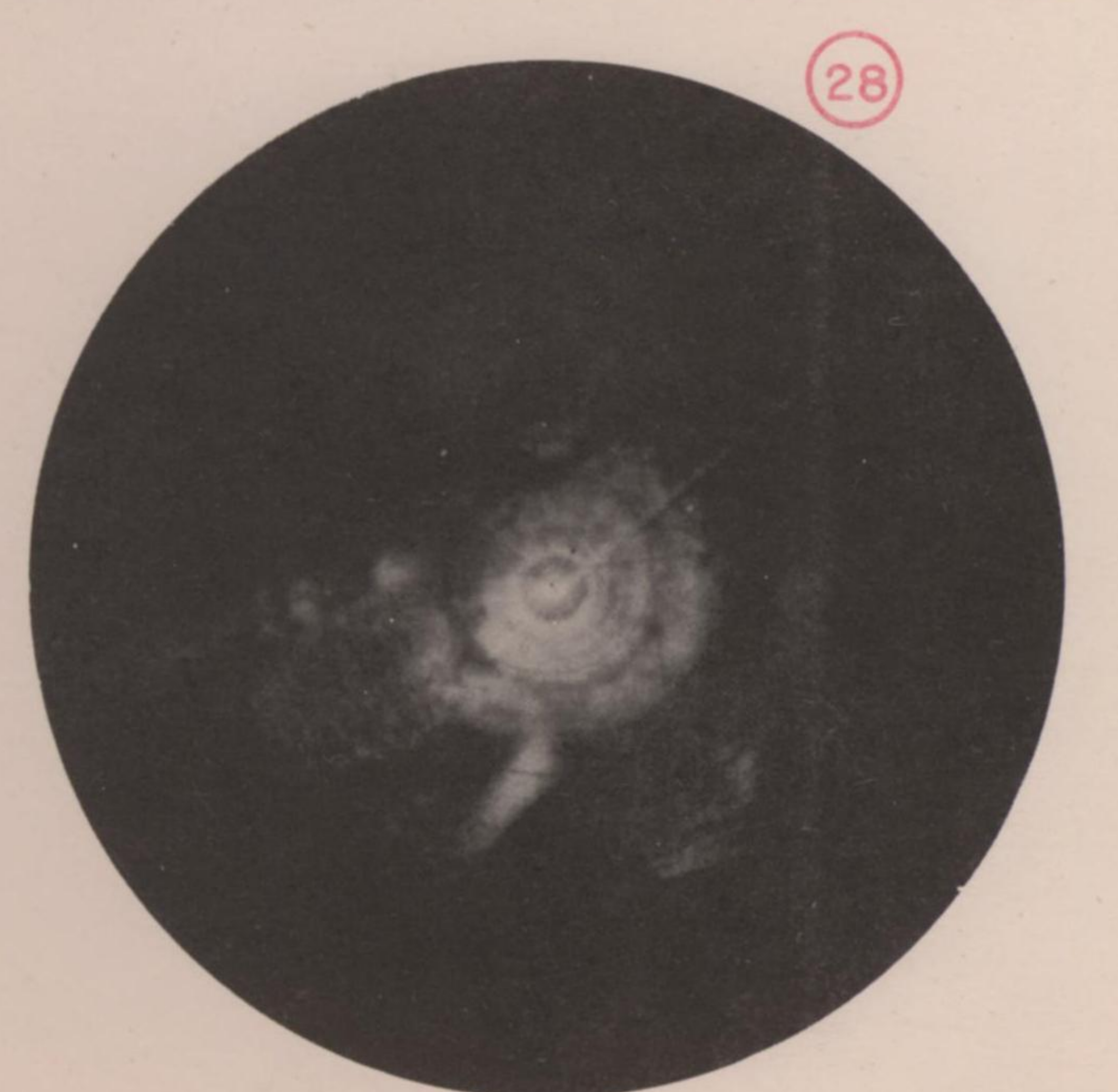
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0 MILE SWEEP



HEADING 51° MAG. 20 MILE SWEEP



HEADING 51° MAG. 20 MILE SWEEP

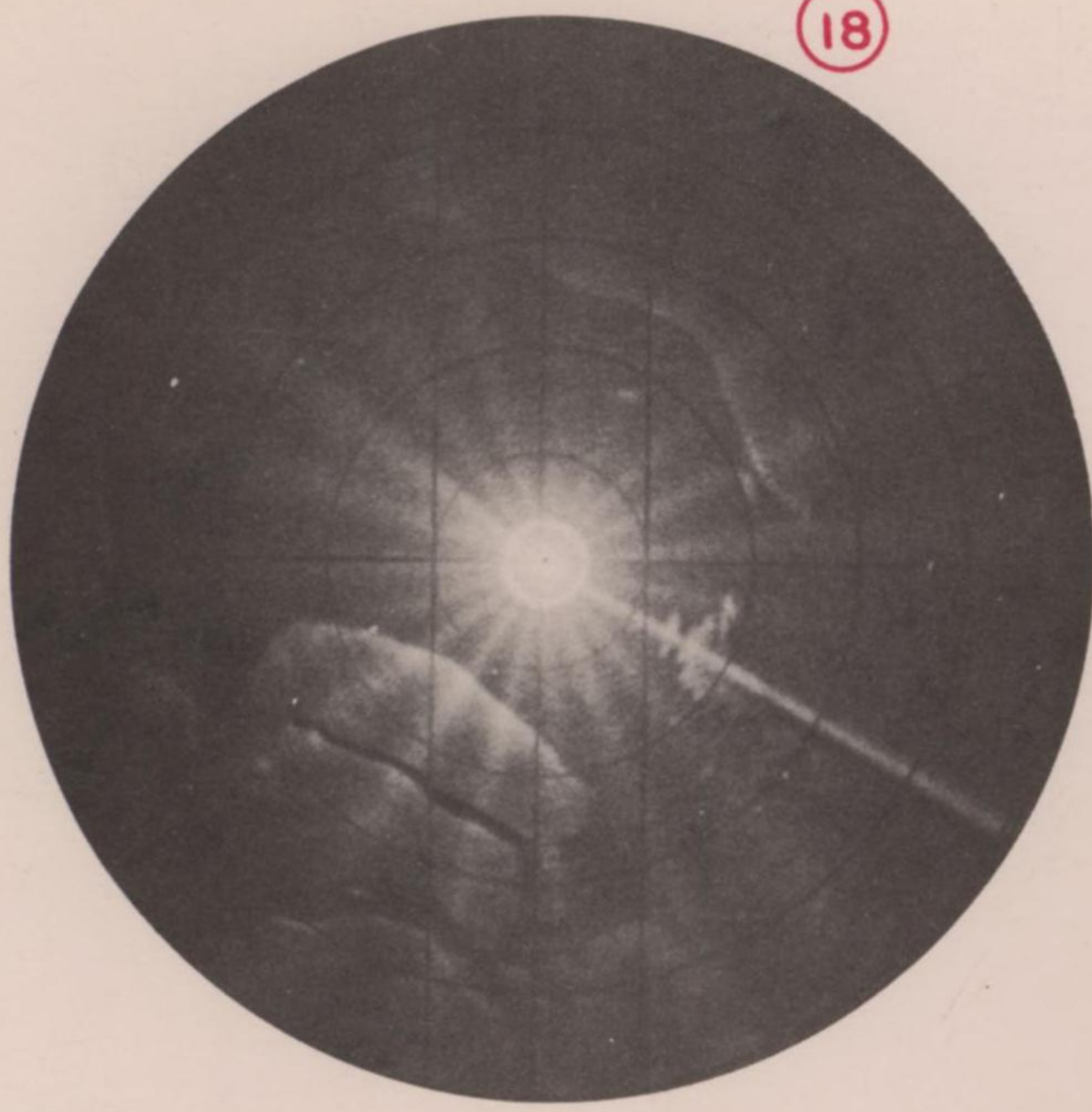
BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX BOMBER COMMAND
SECRET

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 Authority *now* 760063
 By *CD* NAPA Date *12/1/88*

537 - 1/2/45

ALL ALTITUDES 21,000', SWEEPS 25 MILES
UNLESS OTHERWISE INDICATED

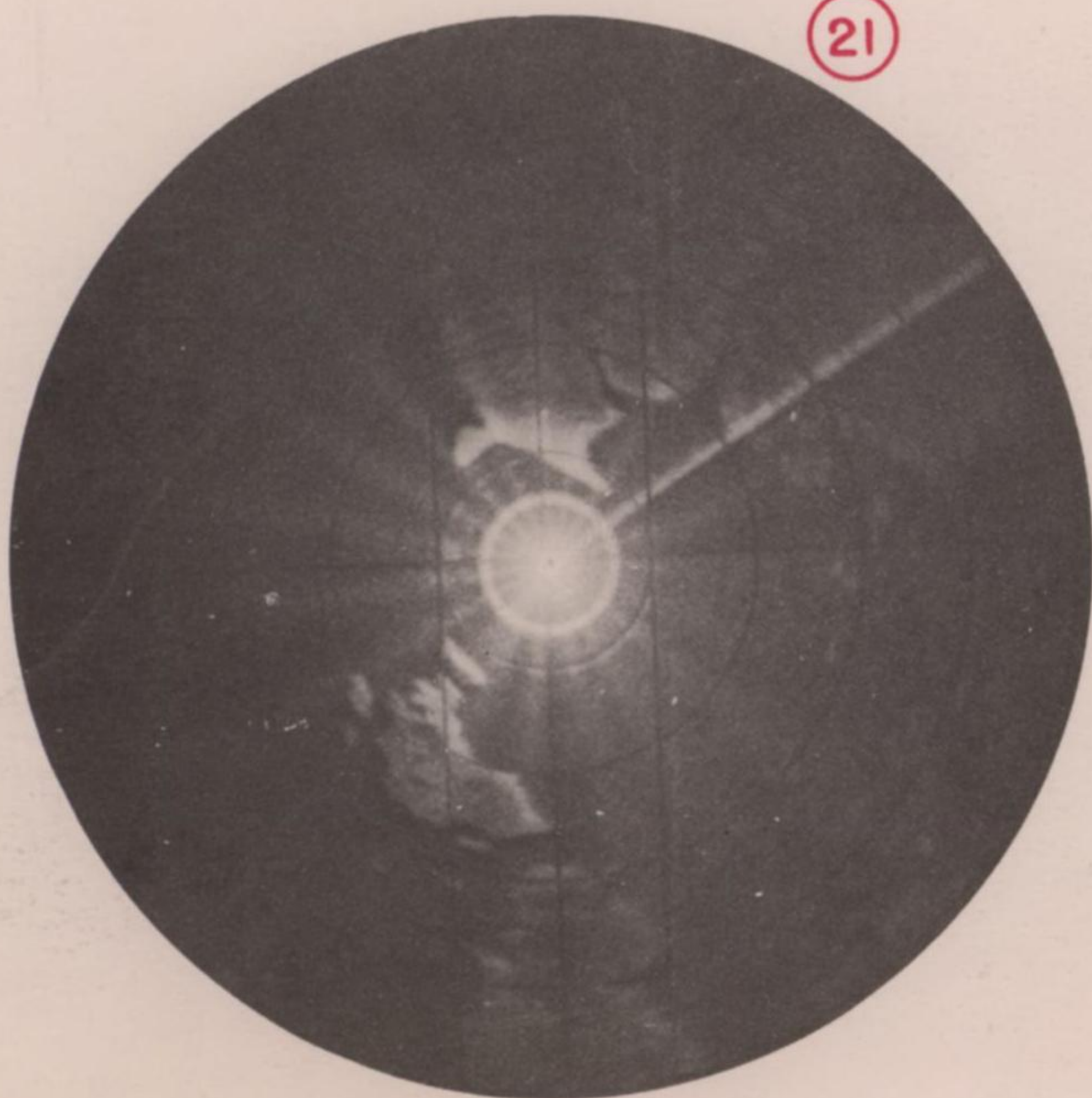
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RADAR PHOTOGRAPH ANALYSIS
SINGAPORE AREA - MALAY STATES
MISSION NO. 33



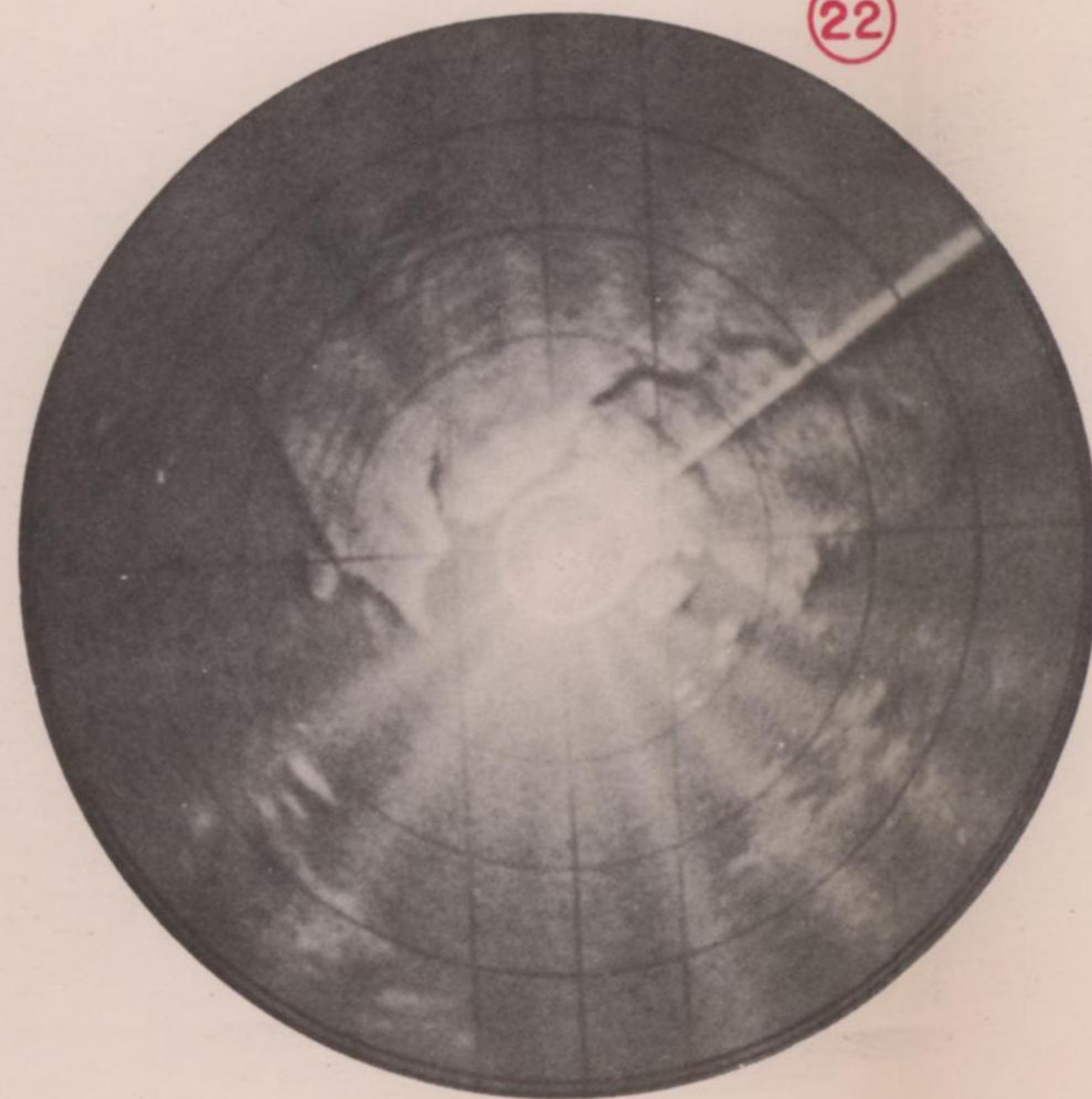
SWEEP 50 MILES HEADING 124° MAG.



HEADING 54° MAG.



HEADING 54° MAG.



HEADING 53° MAG.



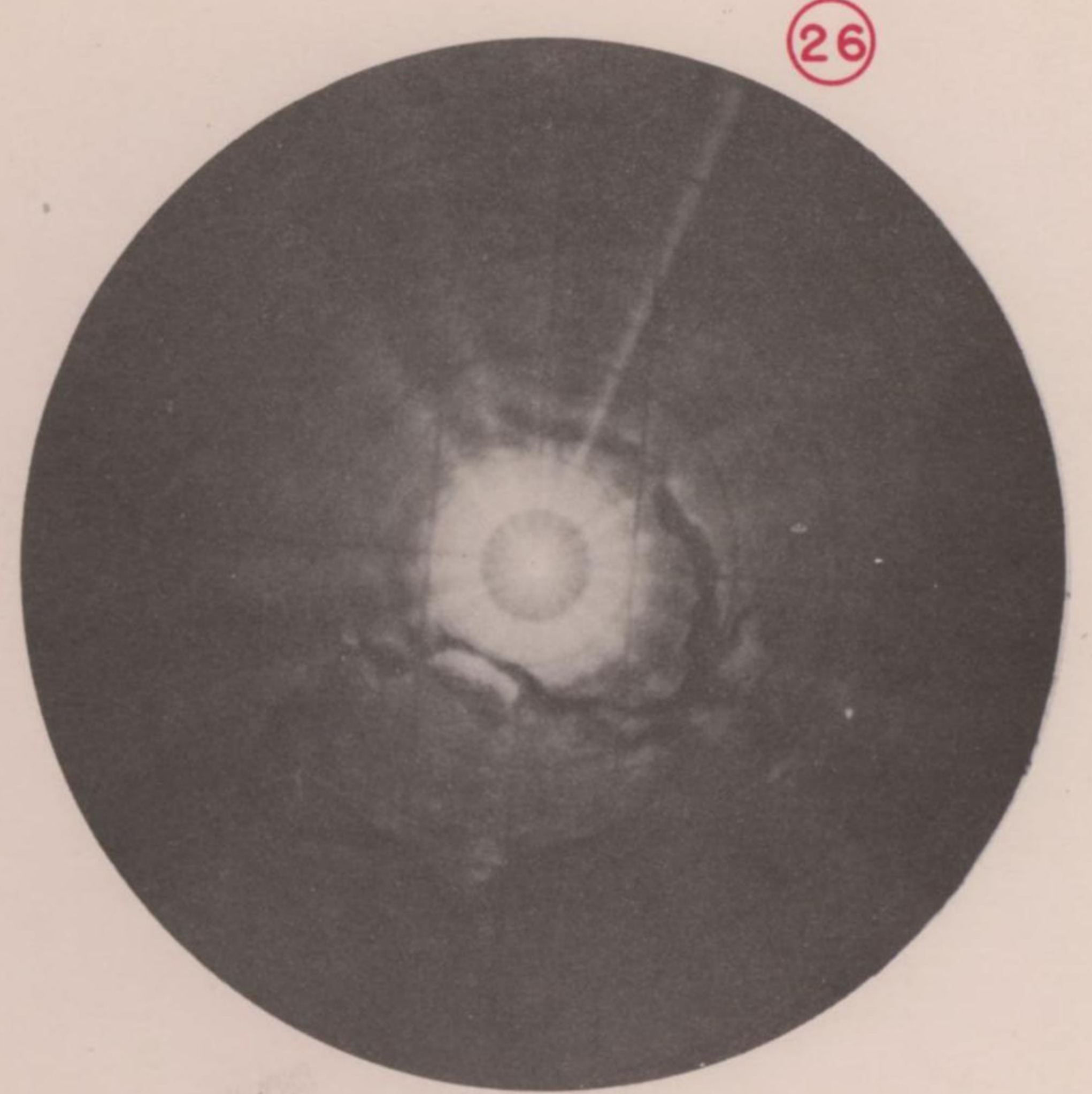
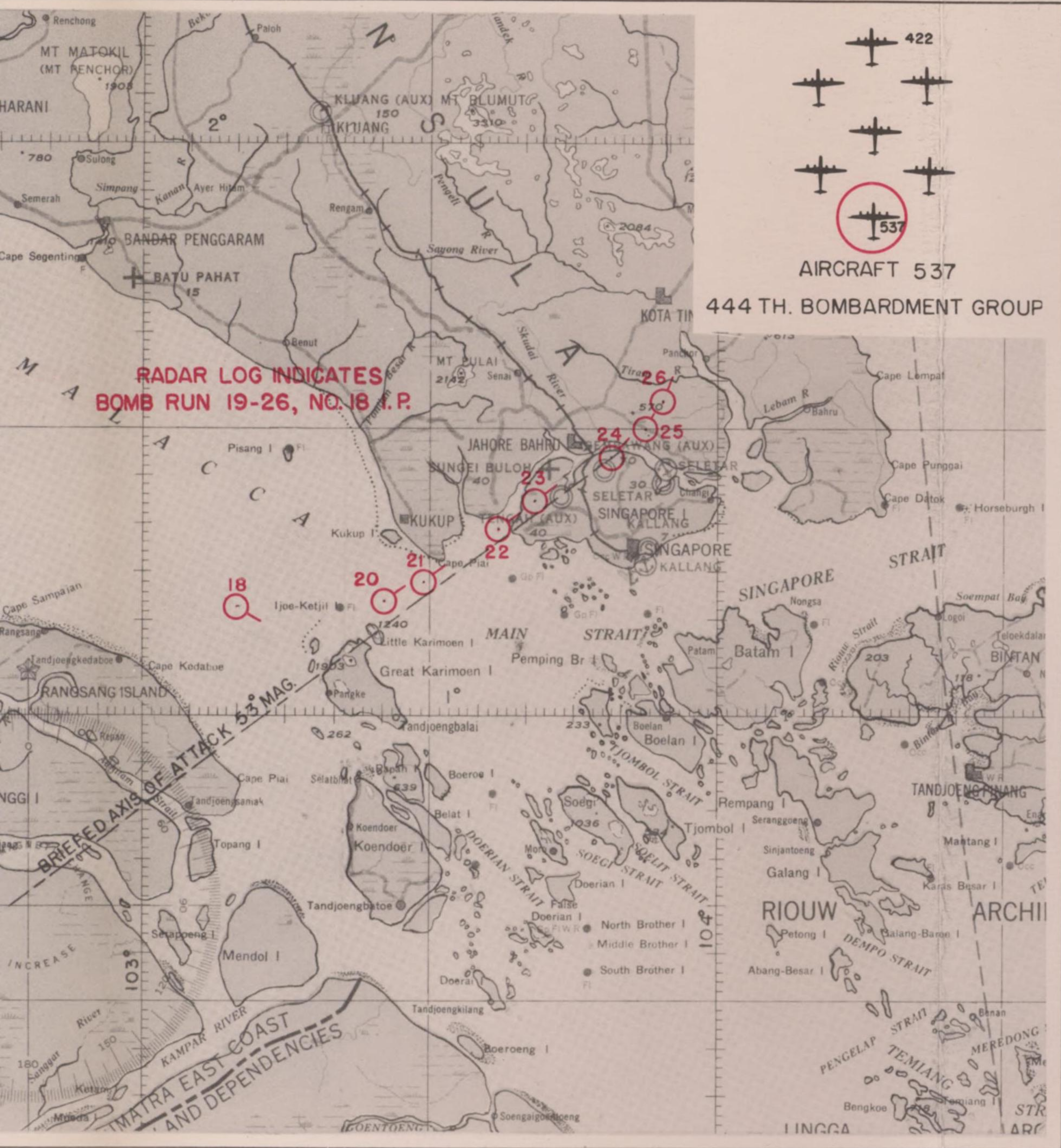
PREPARED BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX B
SECRET

DECLASSIFIED
Authority 760063
By CD WAPA Date 12/1/88

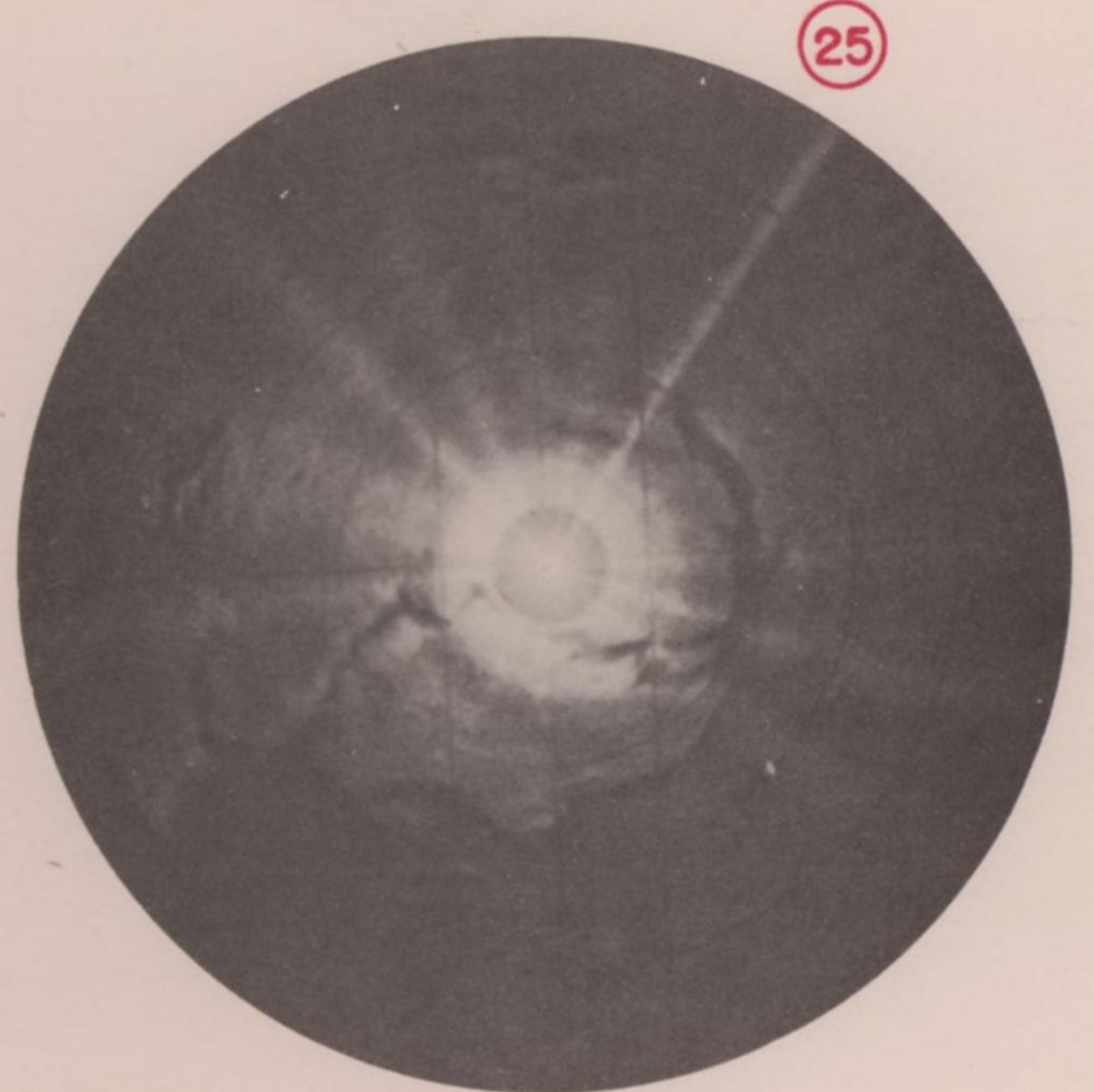
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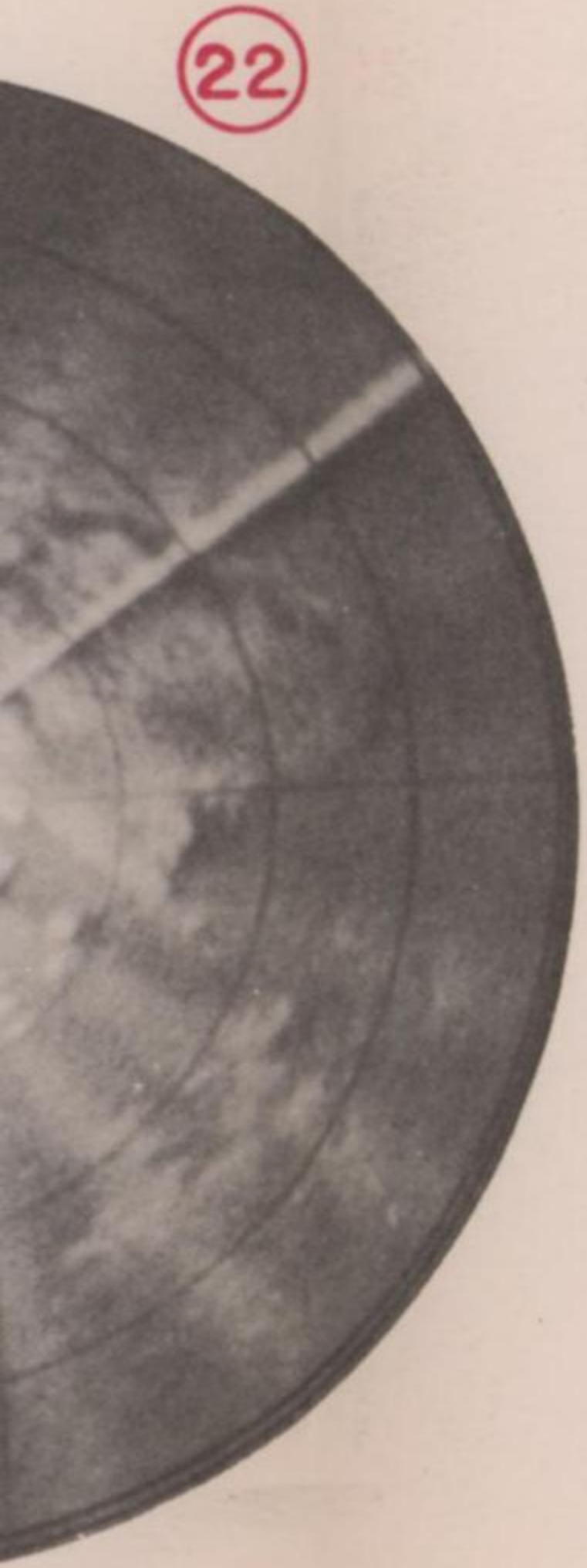
RADAR PHOTOGRAPH ANALYSIS
SINGAPORE AREA - MALAY STATES
MISSION NO. 33



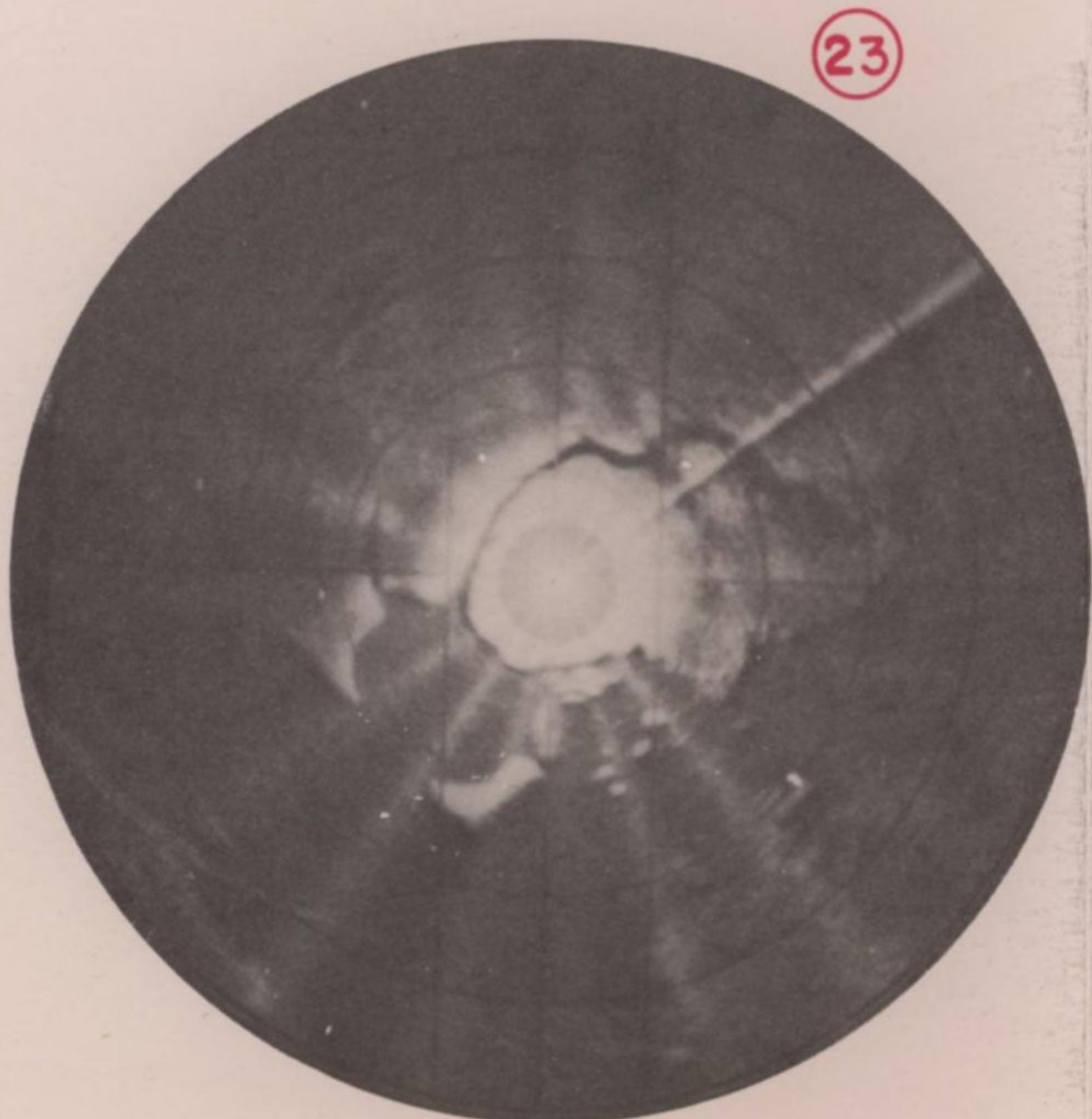
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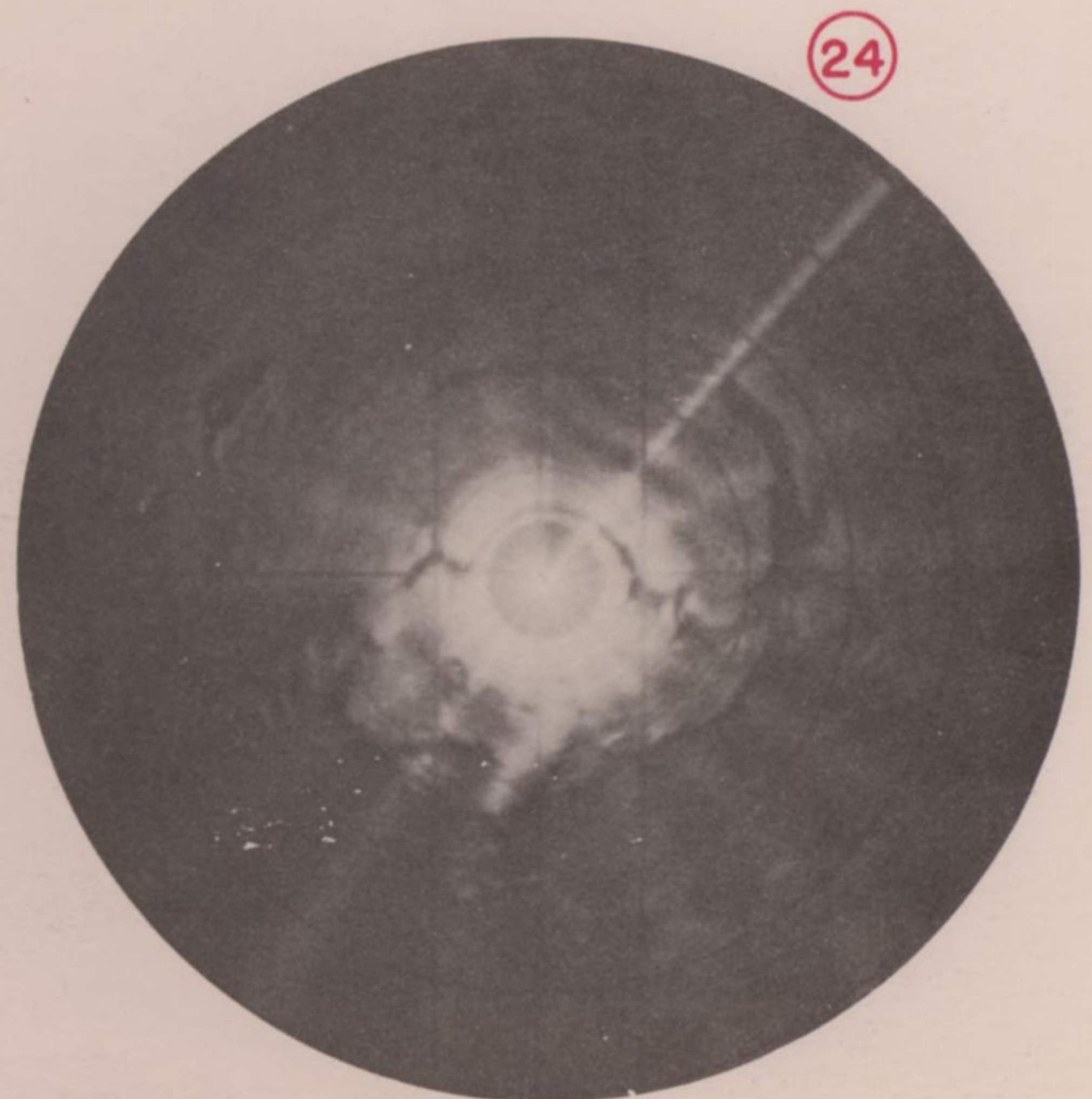
HEADING 33° MAG.



MAG.



HEADING 53° MAG.



HEADING 41° MAG.

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

SECRET

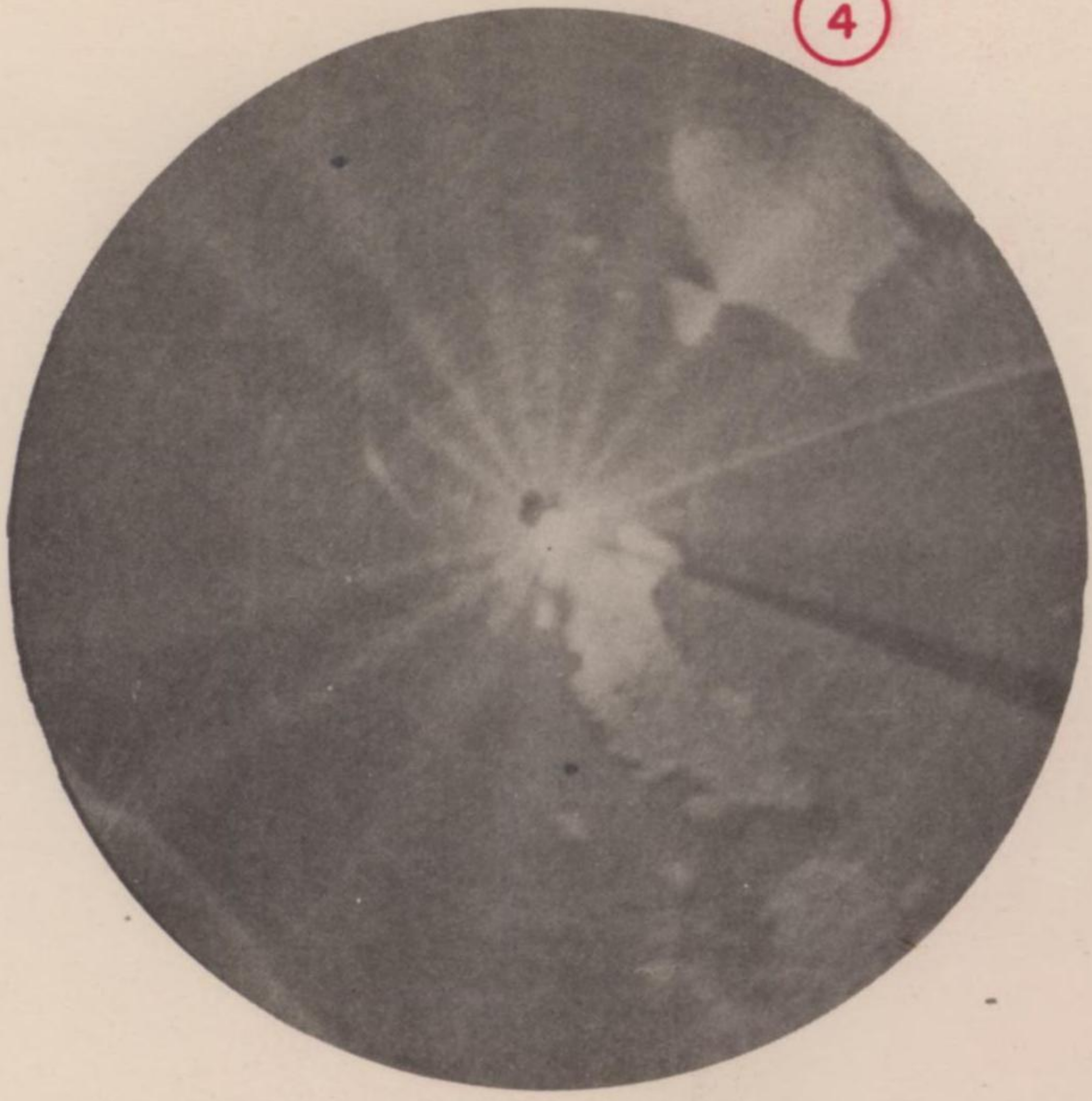
DECLASSIFIED
 Authority AW 7600 63
 By CD NAPA Date 12/1/88

424-1/2/45

ALL SWEEPS 20 MILES.
ALTITUDES 20,000, HEADINGS 60°,
UNLESS OTHERWISE INDICATED

SECRET

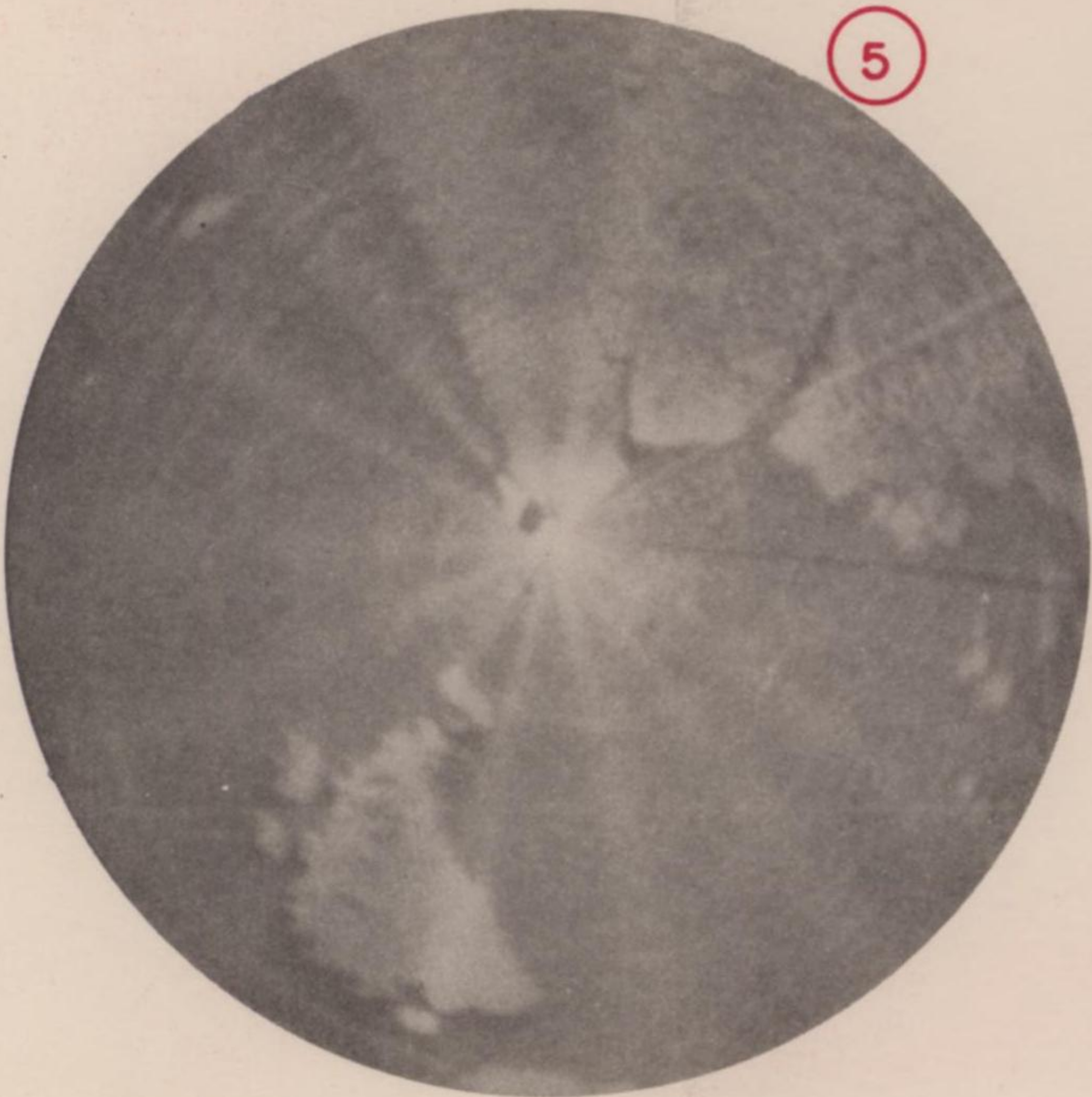
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SINGAPORE AREA - MALAY STATES
MISSION NO. 33



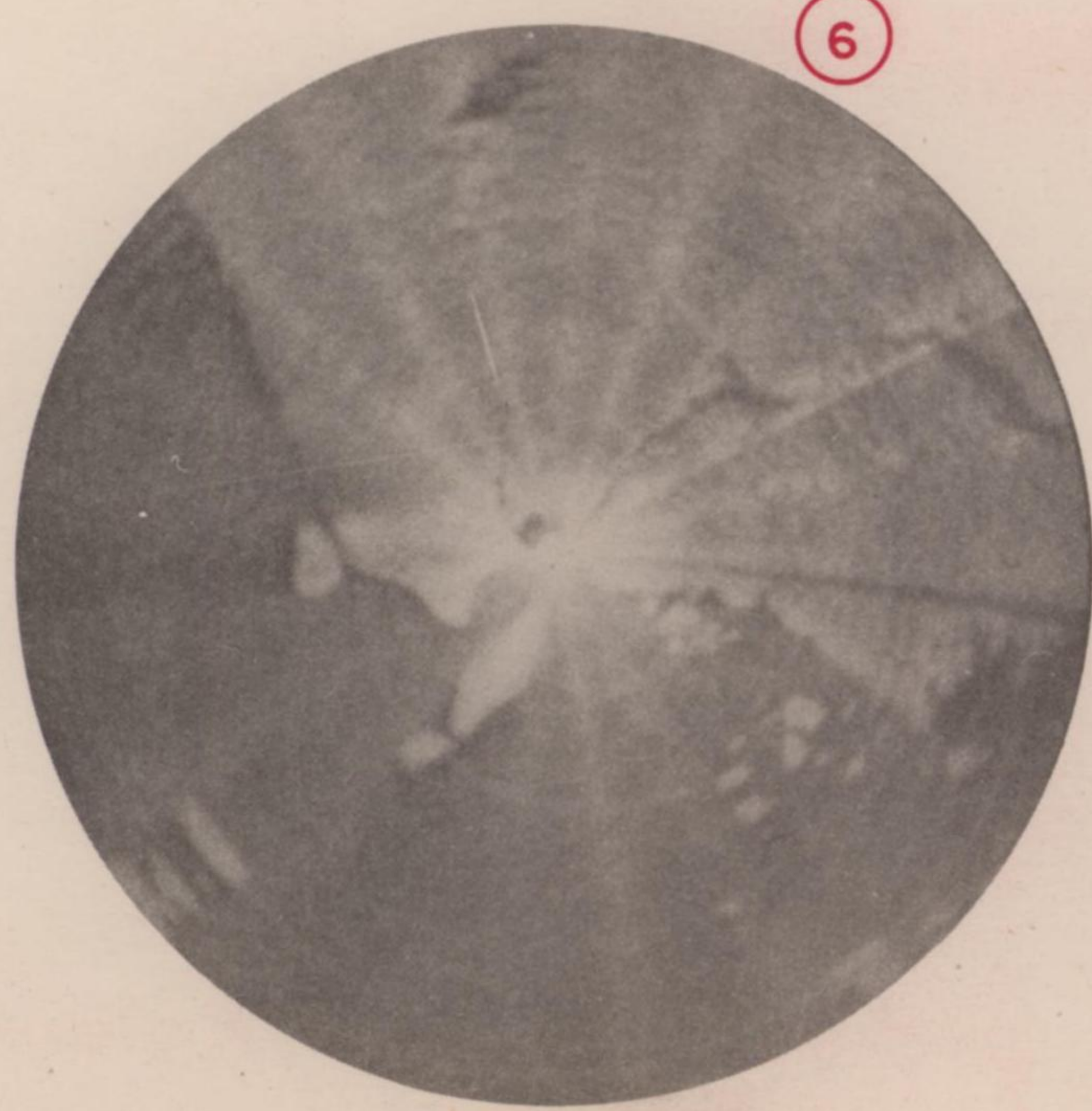
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HEADING 69° MAG.

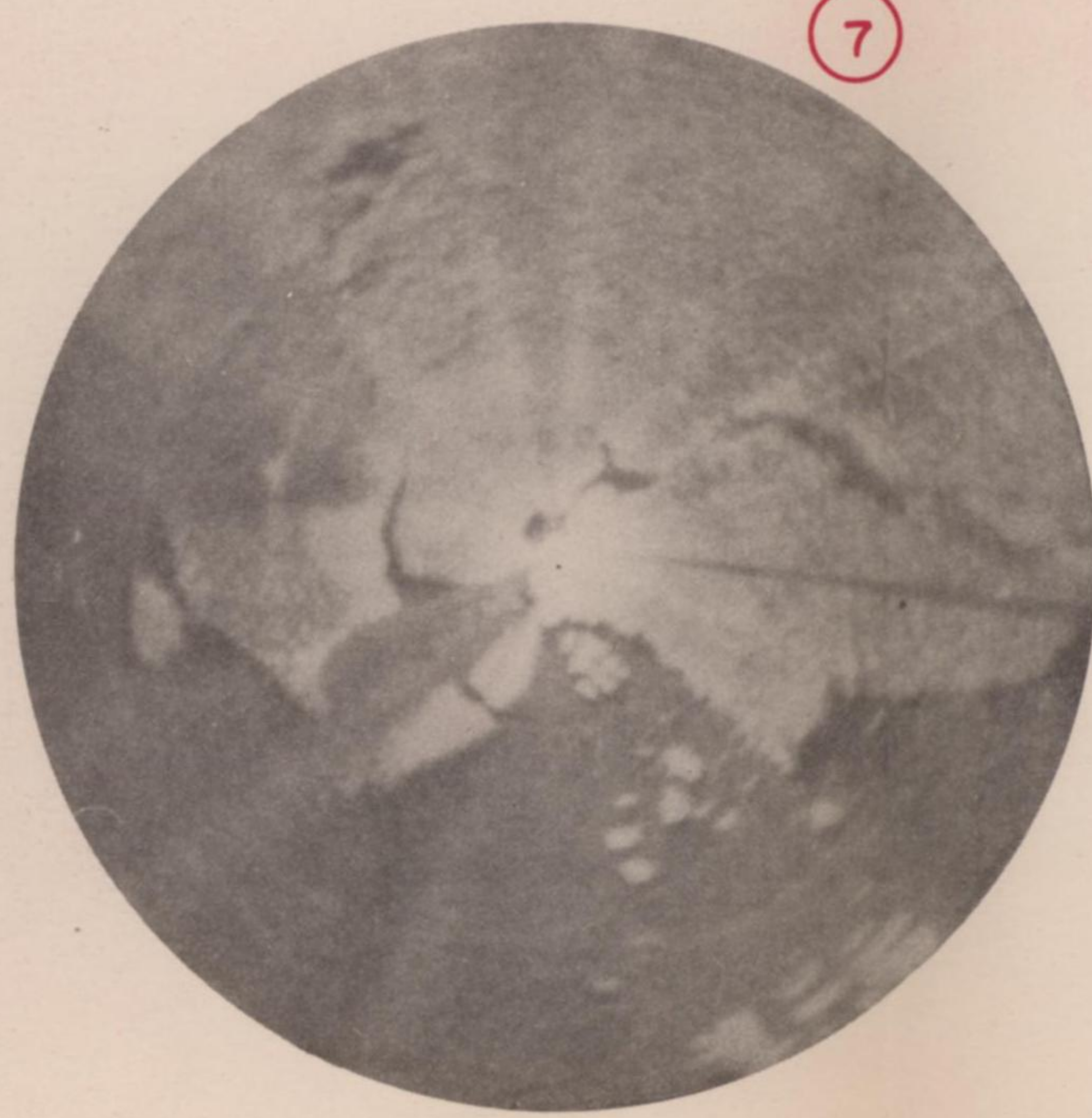
ALTITUDE 19,100



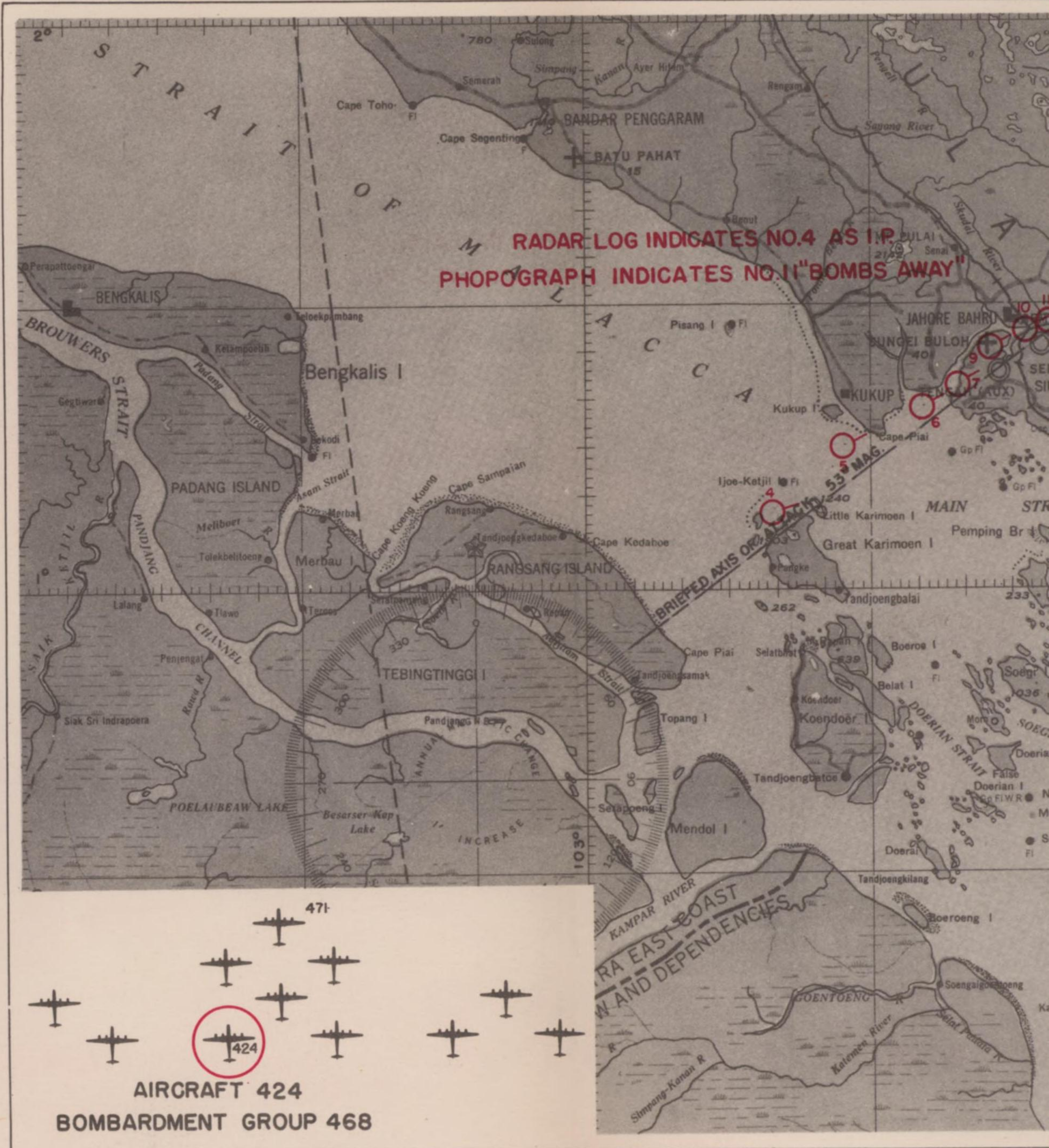
5



6



7



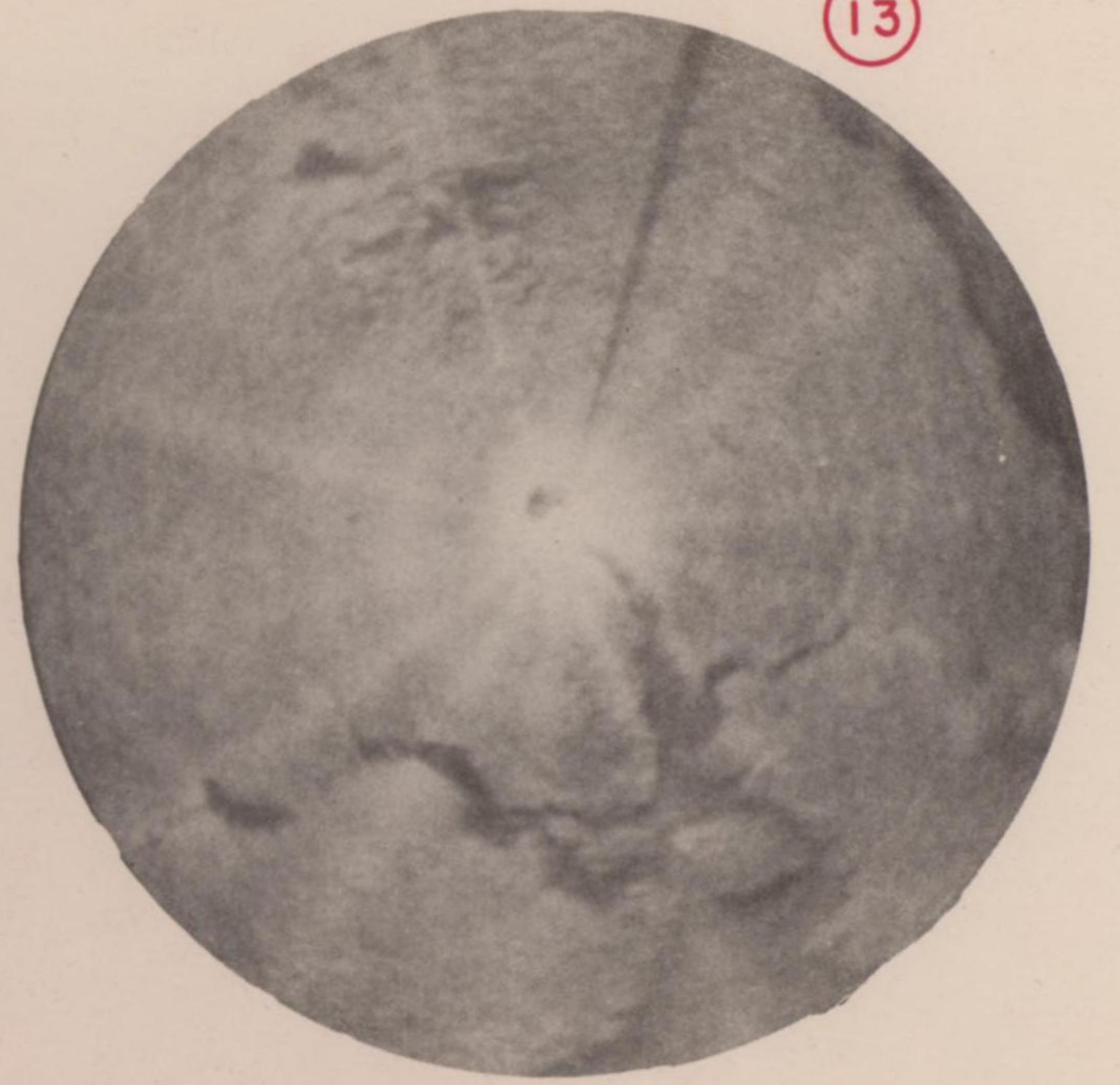
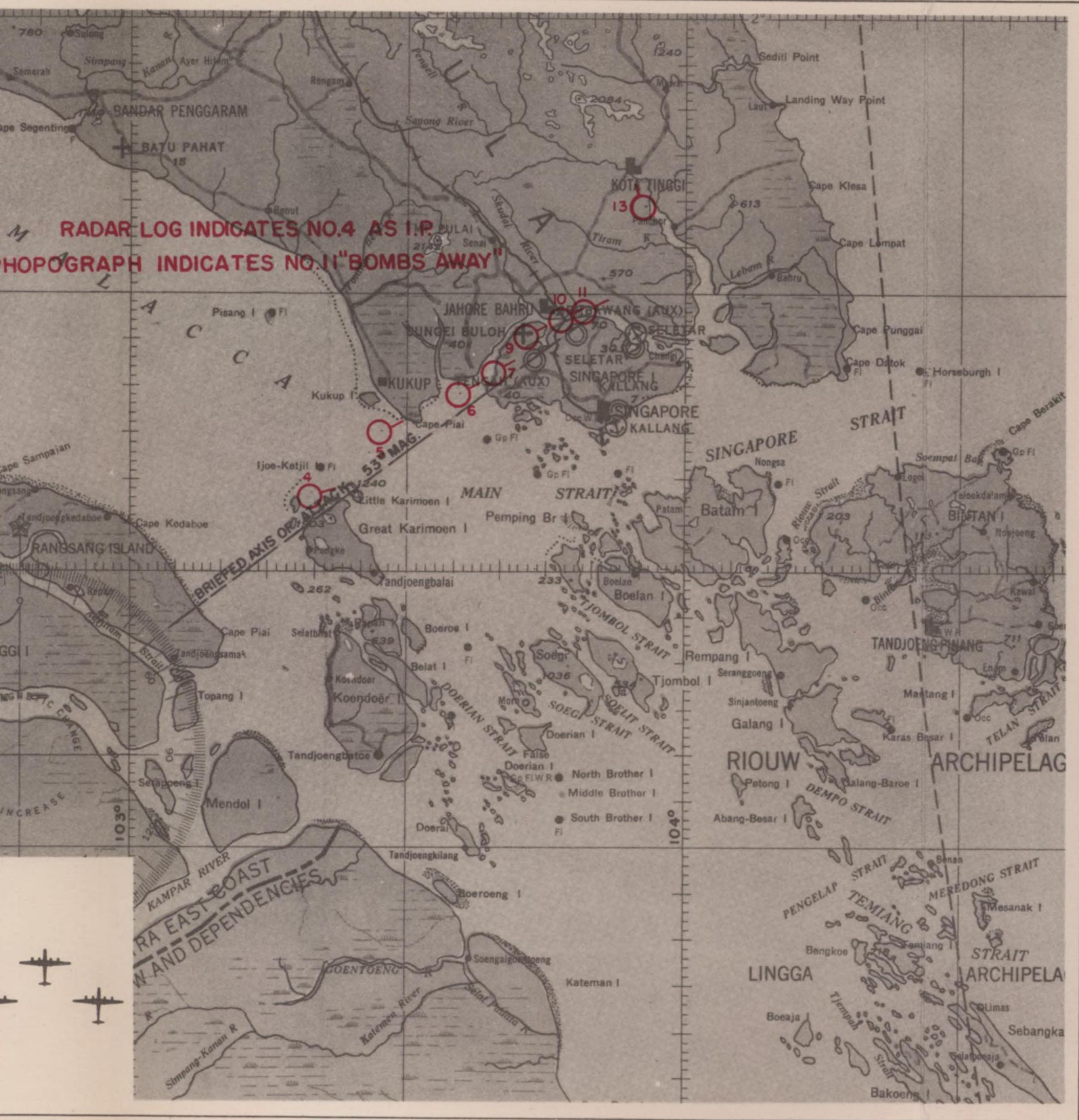
PREPARED BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX B
SECRET

DECLASSIFIED
Authority 760063
By CD NAPA Date 12/1/88

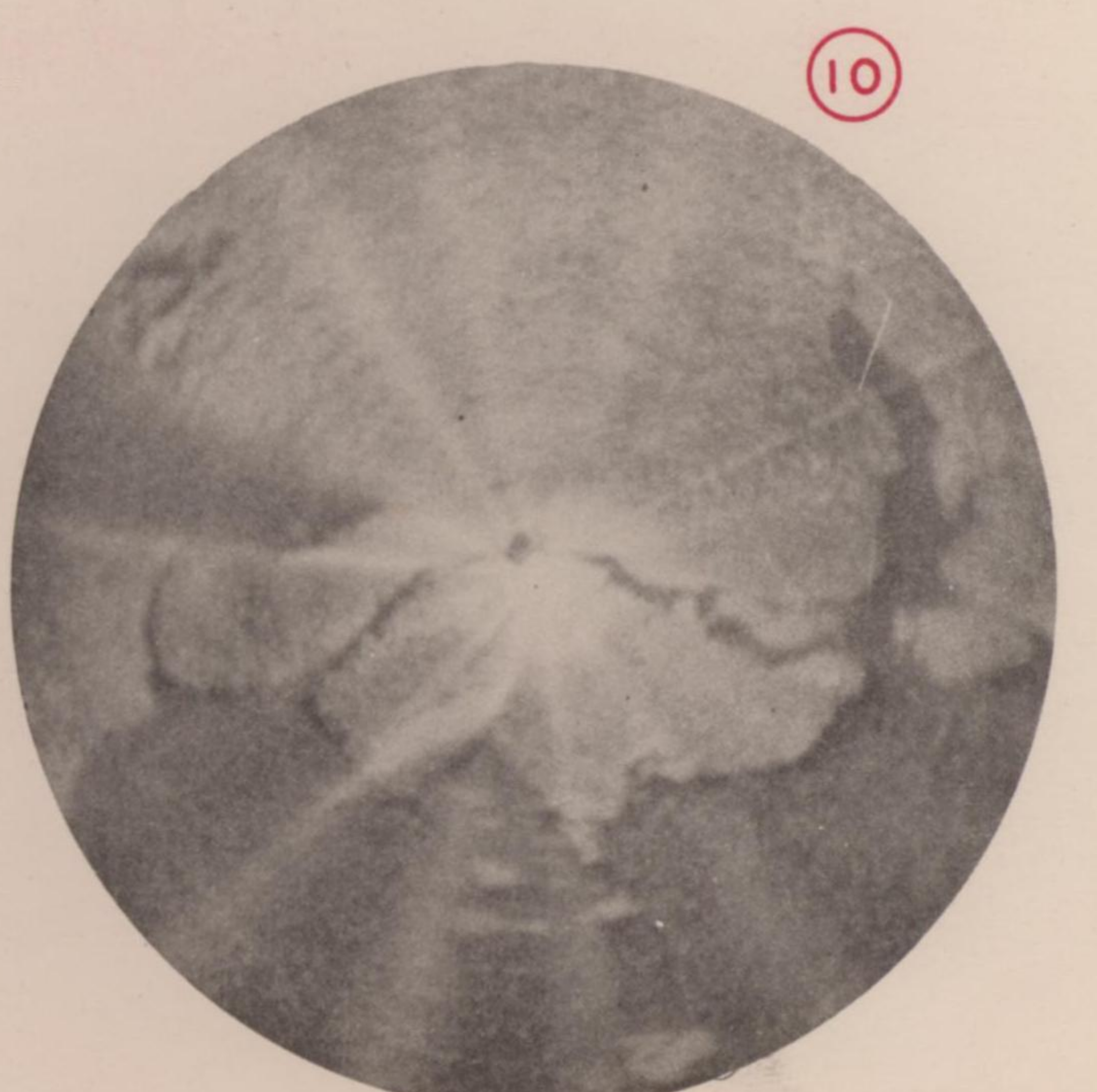
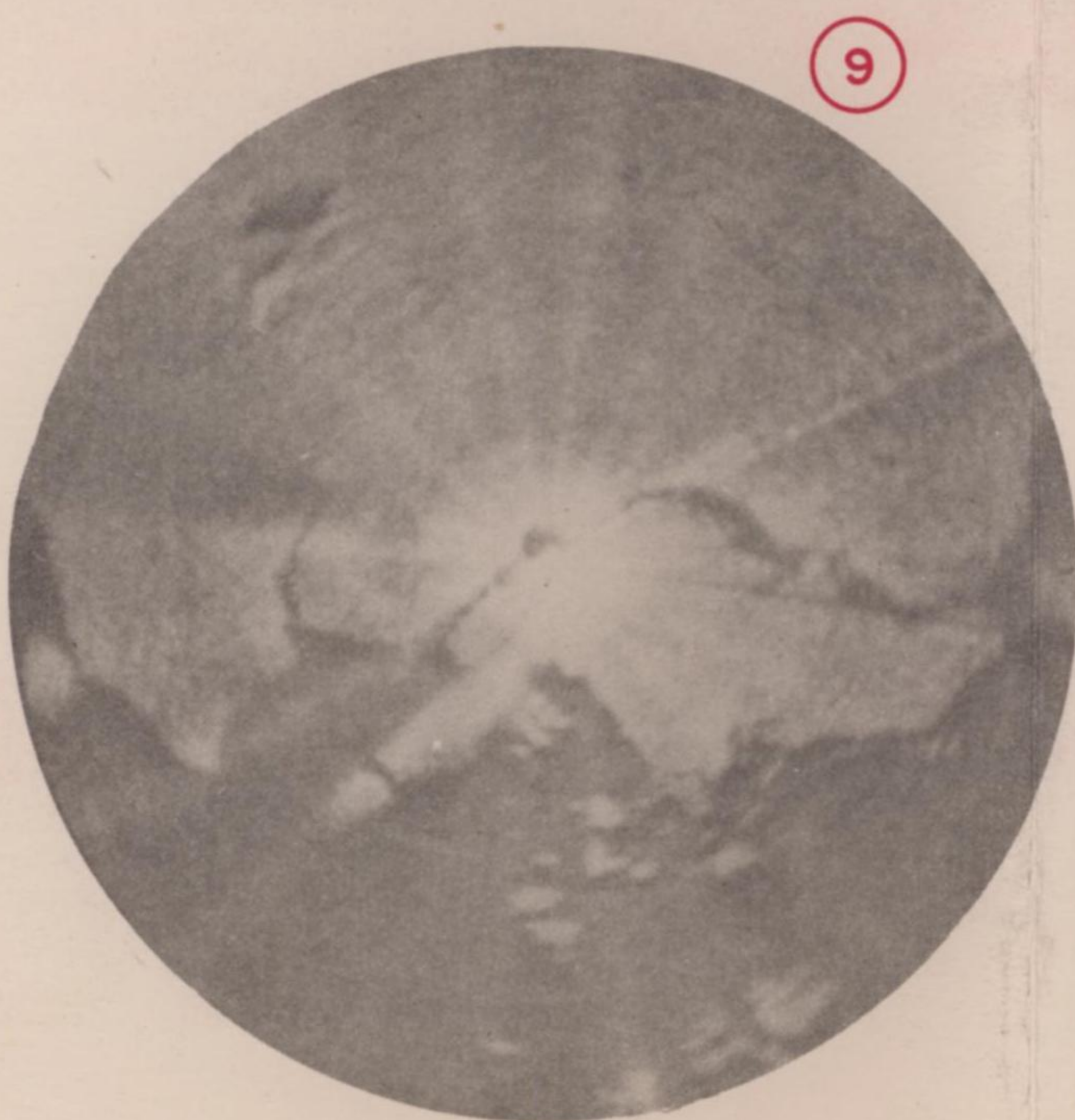
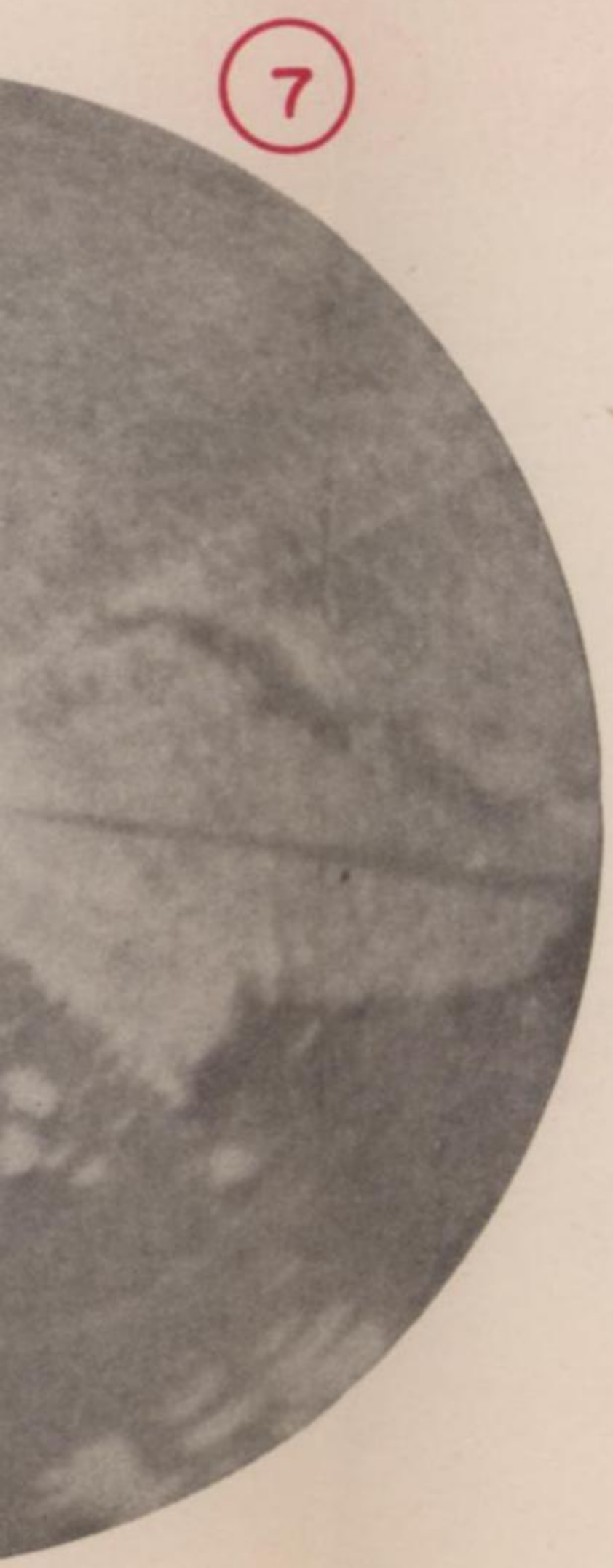
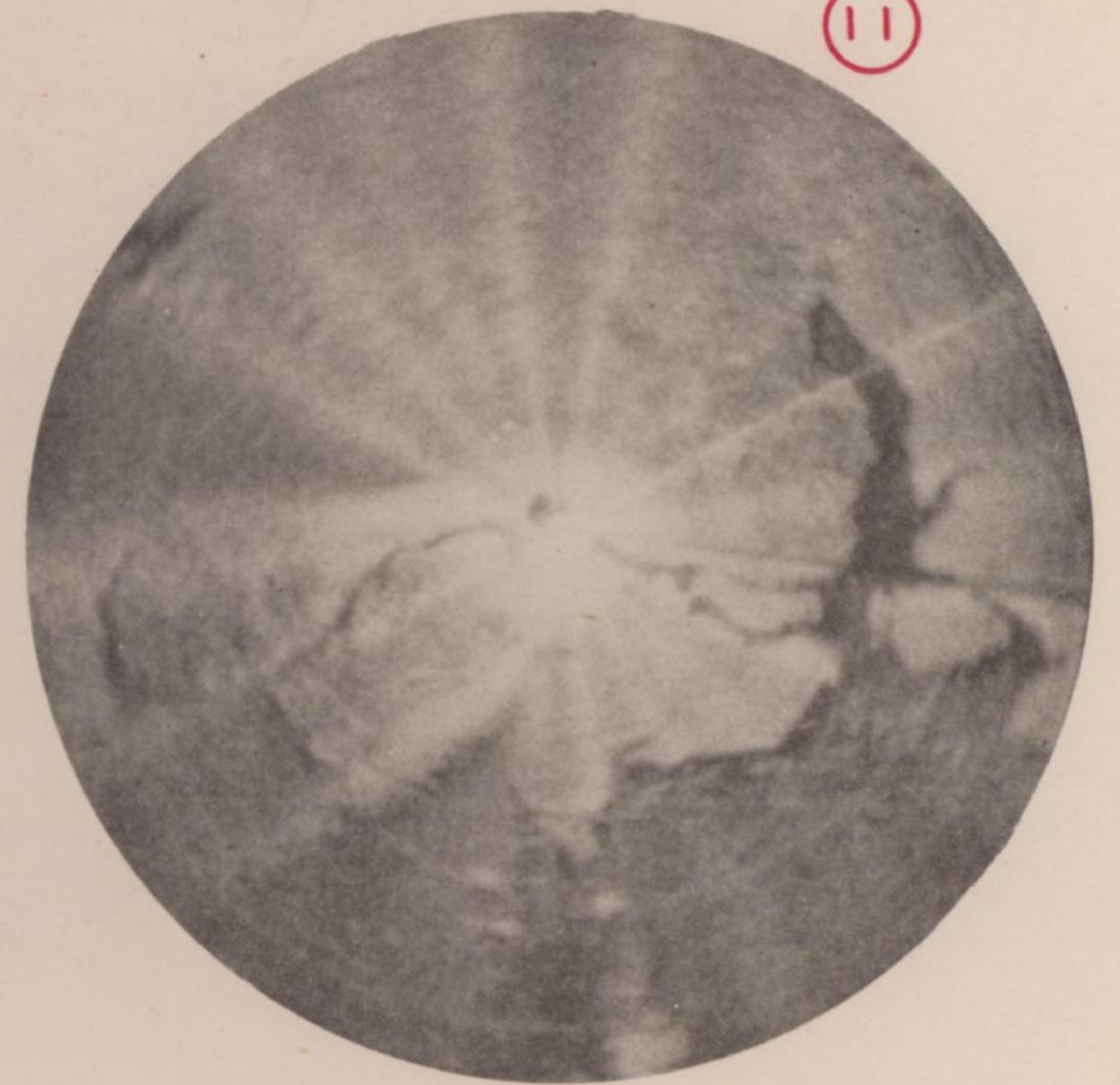
SECRET

R 922-22 SHEET M

RADAR PHOTOGRAPH ANALYSIS
SINGAPORE AREA - MALAY STATES
MISSION NO. 33



HEADING 343° MAG.



BY RADAR INTELLIGENCE, TARGET UNIT, INTELLIGENCE SECTION - XX Bomber Command

SECRET

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 Authority *760063*
 By *CD* NAPA Date *12/1/88*

S E C R E T

ANNEX

G

RCM INFORMATION

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

S E C R E T

DECLASSIFIED
Authority *now* 760063
By *CD* NAPA Date *12/1/88*

S E C R E T

SECRET
Auth: Dep Com 20th AF.
Initials: ncp
Date: 10 Feb. 1945

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

10 February 1945

SUBJECT: RCM Report - Combat Mission No. 33, Singapore,
1 February 45 - Daylight.

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

A. General

Eleven RCM search aircraft, each equipped with a bottom mount D/F antenna, participated in this mission. 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

1. Early Warning intercepts were frequent on this mission, in direct contrast to the previous night mission to Singapore. The radar site located at Great Coco was definitely in operation and search aircraft report being tracked. The Mk 1 Model 1 located at Port Blair was also in operation. It is possible that these radar sites alerted the radar net guarding the Malay Peninsula. Penang Radar was reported strong and steady and not rotating. The "CHI" station located near Medan, Sumatra, last reported on Mission 15, was also in operation, strong and steady. In addition, portable Mk 1 Model 3 radar, Mk 1 Model 2 radar and Mk 1 Model 1 radar were intercepted enroute to and in the target area. This Early Warning net should have provided adequate warning. However, the first aircraft over the target at 0209Z reported only three smoke generators in operation: One at the naval base; two on small craft near the floating dry dock. At 0214Z, five minutes later, maximum smoke effort was realized, with 12 smoke generators in operation.

2. Radar Sites D/F'ed:

A. Following is a brief history of the Great Coco Radar:

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(1) This Command reports 198/1150/10.5 radar site intercept made in Great Coco Island Area, Mission No. 15, 5 November 44.

(2) RAF Ferret report 197 Mc. radar site located on Great Coco, late November 44.

(3) Radar site verified by photographs.

(4) Tactical Airforce bombs radar site, 8 December 44. No further intercepts made for several weeks.

(5) 195 Mc. signal momentarily intercepted by this Command on Mission No. 31 in Great Coco Area. Suggests Great Coco Radar in operation again at a new frequency.

(6) Three fair cuts made on this mission which intersect at $14^{\circ}09'N$ $93^{\circ}23'E$, indicates operation resumed. Characteristics 195/50/10.

B. Port Blair Radar, Andaman Islands: Five separate sets of cuts indicate that two radar sites are in operation. Three sets of cuts suggest a 100/830/15 radar site in the Port Blair Area while two sets of cuts suggest a 97/780/10 radar site also located in the Port Blair Area.

C. Penang Radar: 101/470/15. Nine separate sets of cuts were made on this radar site. A number of cuts intersect at the 2458 ft. peak at $100^{\circ}16'E$ $5^{\circ}21'N$, which would be an ideal location for an Early Warning radar site.

Four excellent cuts intersect at $100^{\circ}17'E$ $5^{\circ}27'N$. However, the operators report no radar shadow effect, so it may be assumed that the radar site has practically 360° sweep and is located on the 2458 ft. peak.

D. Medan Area, Sumatra: 77/487/50. Four separate sets of cuts were made on this radar site. One operator shot four fair cuts which intersect at Medan. Two other operators place the site at approximately $98^{\circ}53'E$ $3^{\circ}25'N$ and $97^{\circ}53'E$ $3^{\circ}28'N$ respectively. It is interesting to note that a radar site with similar characteristics was roughly located in the Aroe Bay Area on Mission No. 15.

E. Singapore Radar: 100/500/8. Four good cuts locate this radar site at approximately $103^{\circ}42'E$ $1^{\circ}18'N$. This radar site is the same site that was D/F'ed to $103^{\circ}49'E$ $1^{\circ}17'N$ on Combat Mission No. 31.

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F. 198/1043/10 radar site located at approximately 102°E 2°35'N. One other operator shot two cuts on this site which intersect near Port Dickson at approximately 101°50'E 2°30'N.

G. 98/545/16.5: Three D/F cuts locate this radar site at approximately 101°25'E 2°50'N. Will be classed as suspected until further verification.

H. 164/482/10 radar site located near Lumut at approximately 100°38'E 4°14'N. Will be classed as suspected until further verification.

3. Possible Radar Fire Control Equipment.

A. The following Mk 2 Model 1 or Mk 1 Model 2 type radar signals were intercepted in the area of the assembly point, initial point or target:

190.4/ - /12
192/920/8
193/920/5
196/984/7
198/1065/10
198/978/5
199/916/8
200/1000/8
205/1056/15
206/990/10
208/972/10
210/929/10.5

B. The following signals were reported by only one operator and therefore will be classified as suspected pending further intercepts.

298/ - /4 target area
135/2780/5 " "

C. An "S" Band signal was intercepted throughout the bomb run on an AN/APR-7 Receiver. The signal was definitely tuneable, however, the characteristics identify the signal as that of the AN/APG-15.

D. Although the intercepts do not have characteristics generally associated with radar fire control equipment it is possible that the enemy was using radar for this purpose.

C. Enemy Countermeasures

No enemy countermeasures reported.

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D. Equipment

1. The C2113 Balance Converter was used on this mission. The high attenuation prevented the use of the D/F antenna even on strong radar stations.

2. The AN/APA-11 Pulse Analyzer operated in a satisfactory manner, however, one of the following modifications was made on each unit prior to installation:

- A. Dust cover removed.
- B. Holes drilled in the dust cover for ventilation.
- C. Transmitter blower motor installed for forced ventilation.

3. The coarse PRF adjustment on the AN/APA-11 became loose and difficulty in determining the correct PRF was encountered.

4. Set screw on the selsyn transmitter of the AN/APA-24 D/F antenna became loose.

5. Low sensitivity of an AN/APR-4 receiver due to faulty turning unit.

Note: Exhibits showing the D/F cuts on each radar site listed in this report will be included in the Monthly Enemy Radar Report.

Letters on the RCM Search Aircraft Track and D/F Cuts correspond to the letters listed under Para. 2, Radar Sites D/F'ed.

No RCM search aircraft participated in Combat Mission No. 32.

FOR THE DEPUTY COMMANDER:

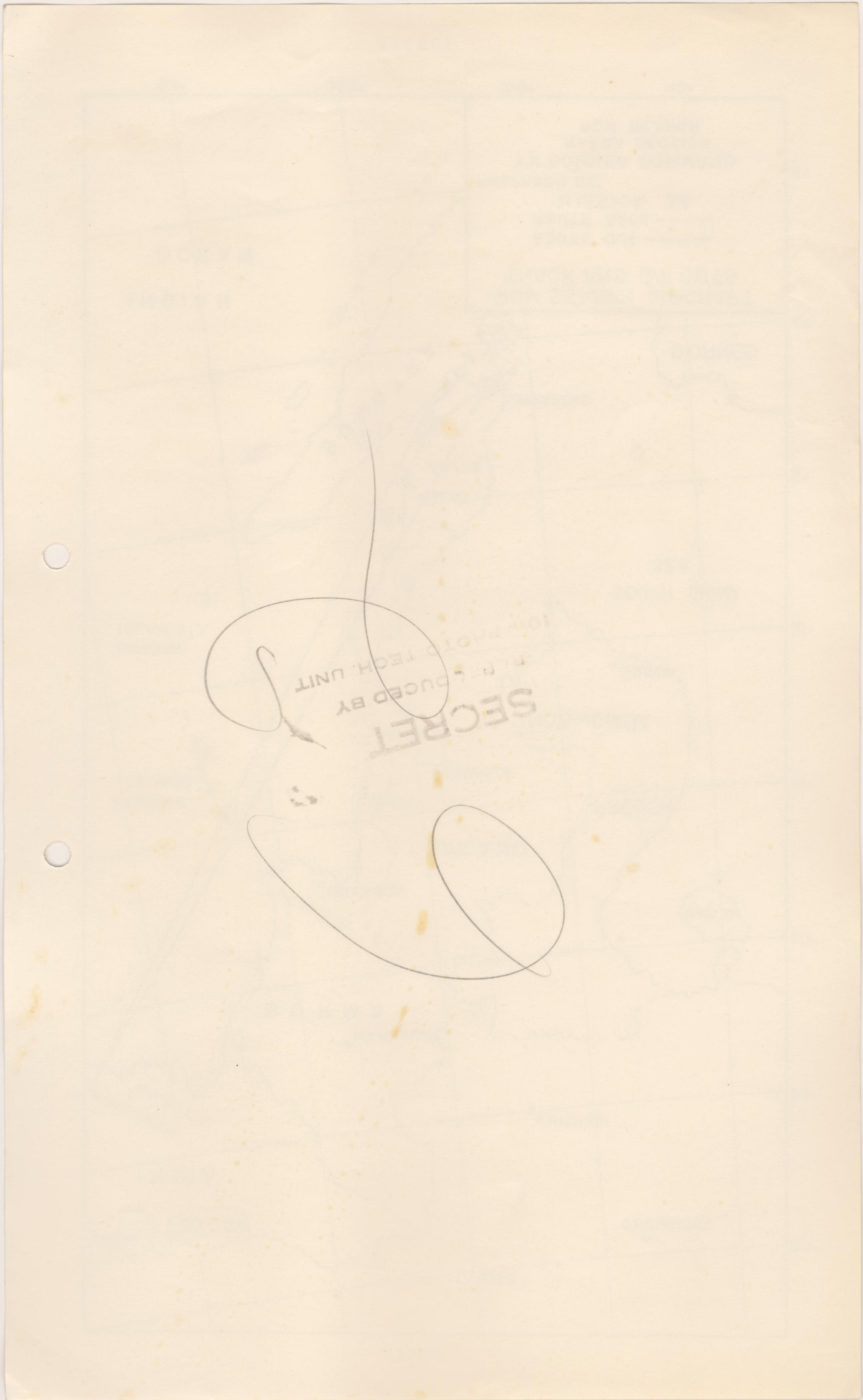
Leo I. Herman
LEO I. HERMAN
Colonel, Air Corps
Actg. Adjutant General

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

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THE PHOTO TECH. UNIT

S E C R E T

ANNEX

H

CENTRAL STATION FIRE CONTROL AND GUNNERY

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

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DECLASSIFIED
Authority *now* 760063
By *CD* NAPA Date *12/1/88*

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HEADQUARTERS
XX BOMBER COMMAND
APO 493

SECRET

Auth: CG, XX BC
Initials NIJ
Date: 7 February '45

CONSOLIDATED
SPECIALIST MISSION REPORT
OF STAFF GUNNERY OFFICER

Date Prepared: 6 February 1945

Field Order Number 33
Date of Mission: 1 Feb. '45

1. On the mission directed by Field Order No. 33 fighter attacks were considered numerous but not aggressive. The majority of attacks were not pressed within 500 yards as the supporting fire from our formations probably discouraged enemy pilots from following through with their attacks.

2. The mission is considered as satisfactory in regards to functioning of Central Fire Control equipment.

3. The following statistical data is submitted:

	<u>40th</u>	<u>444th</u>	<u>462nd</u>	<u>468th</u>
Ammunition used test firing	2265	2395	2140	2680
Ammunition used in combat	11415	5395	9875	18445
Malfunctions of CFC system	3	1	2	3
Total turrets on mission	135	130	135	135
Malfunction of cal .50 MGS	3	2	2	3
Total MGS on mission	324	292	324	324
Total airplanes (included in report)	27	26	27	27

Total percent malfunctions all groups C.F.C. 1.6% cal. .50 MGS less than 1%.

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S E C R E T

ANNEX

I

CAMERAS AND PHOTOGRAPHS

S E C R E T

CAMERAS AND PHOTOGRAPHS

Mission No. 33

1 February 1945

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	40th			444th			462nd		468th			Total					
	K18	K20	K22	K18	K20	K22	K17	K18	K20	K22	K18	K20	K22	K17	K18	K20	K22
Cameras airborne	4	18	10a	8	5	9	8	4	10	2	4	1	11	8	20	34	32
In missing and non-reporting A/C	0	b	1b	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Completing mission	4	17	9	8	5	9	8	4	10	2	4	1	11	8	20	33	31
Photographing targets	3	12	7	4	5	4c	6d	4	2	2	3	1	11	6	14	20	24
Failure to photograph - mechanical	0	0	1e	2f	0	0	0	0	0	0	0	0	0	0	2	0	1
Failure to photograph - other reasons	1	5	1g	2	0	5	2	0	8	0	1	0	0	2	4	13	6
Usable negatives	66	109	69	8	5	12	39	33	5	19	15	5	39	39	122	124	139

- a. A/C #620 carried a K-22 camera with a 40" scope.
- b. Lost on A/C #589.
- c. A/C #720 threw camera overboard.
- d. A/C #474 threw camera overboard.
- e. A/C #538, intervalometer failure.
- f. A/C #732, motor burned out. A/C #422, intervalometer malfunction.
- g. A/C #888, oil on filter.

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ANNEX

J

AIRCRAFT LOSSES AND DAMAGE

S E C R E T

DECLASSIFIED
Authority *now 760063*
By *CD* NAPA Date *12/1/88*

SECRET

I - AIRCRAFT LOSSES AND DAMAGE

Mission No. 33

1 February 1945

A. Aircraft Losses

1. Known Battle Losses:

a. Shortly after bombs away A/C #589 (40th) was attacked and damaged by a Tojo from the rear, high. To avail itself of maximum protection, A/C #589 assumed the lead position of a four-plane formation and requested information on smoke and fire in the right wing section. Aircraft #498 confirmed seeing smoke and gasoline pouring from the wing between #3 and #4 engines. Not long thereafter, A/C #589 turned from the formation and took a heading between 25 degrees and 30 degrees. At this time A/C #498 could see smoke but no flame coming from the damaged wing section and queried A/C #589 as to its intentions. Aircraft #589 answered that it was heading for a predetermined neighborhood where a submarine was to be located in accordance with air-sea rescue arrangements. It declined offers for further escort. Aircraft #589 was last seen at 0225Z at 01°50'N - 103°26'E on a heading of 26 degrees magnetic. It did not appear to be in extreme distress and was retaining altitude. Rescue was not effected because of an incorrect initial position report and nothing further has been learned of the fate of this aircraft.

b. A/C 736 (444th) sustained hits by flak while over the primary target, resulting in #1 engine being knocked out and the propeller of #2 engine sticking at 2000 RPM. Because of this damage the aircraft crashed on landing at it's home base and was surveyed on D-day plus 2.

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.

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ANNEX

K

FUNCTIONING OF EQUIPMENT

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

* Prepared by Staff Flight Engineer

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I - FUNCTIONING OF EQUIPMENT

Mission No. 33

1 February 1945

1. A/C airborne 113
2. Less A/C failing to bomb the primary target - mechanical 16
 - a. Bombed the secondary target (8):
 - (1) A/C 522 (40th) - airspeed indicator malfunction
 - (2) A/C 472 (444th) - engine running rough, backfiring
 - (3) A/C 873 (444th) - electrical trouble, intercom, system out
 - (4) A/C 838 (462nd) - #2 engine feathered
 - (5) A/C 502 (462nd) - engines hot, high fuel consumption
 - (6) A/C 417 (468th) - electrical system failure
 - (7) A/C 487 (468th) - #3 booster pump out
 - (8) A/C 460 (468th) - #4 supercharger malfunction
 - b. Bombed last resort target (5):
 - (1) A/C 455 (40th) - nacelle doors would not close
 - (2) A/C 233 (40th) - overheated voltage generator
 - (3) A/C 729 (40th) - spark plug leads broken and oil in distributor
 - (4) A/C 730 (444th) - excessive fuel pressure #1 engine
 - (5) A/C 800 (462nd) - prop governor stuck at 2700 RPM
 - c. Jettisoned bombs (2):
 - (1) A/C 580 (444th) - fuel transfer inoperative
 - (2) A/C 232 (462nd) - electrical system failure
 - d. Returning bombs (1):
 - (1) A/C 587 (40th) - fuel transfer failure
3. Less A/C failing to bomb the primary target - other reasons 9
 - a. Personnel error (5):
 - (1) A/C 508 (40th) - inaccurate position reports by navigator caused engineer to believe fuel consumption excessive - bombed secondary target
 - (2) A/C 861 (444th) - engineer did not think sufficient fuel available to complete mission - bombed secondary target
 - (3) A/C 375 (444th) - could not locate formation and bombed secondary target
 - (4) A/C 456 (468th) - fuses burnt out, engineer did not know where fuses were - bombed target of opportunity.
 - (5) A/C 532 (468th) - bombardier failed to hit salvo lever - bombed secondary target.

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b. Weather (2):

- (1) A/C 208 (468th) - gas consumption too high for distance travelled after encountering bad weather - bombed secondary target
- (2) A/C 734 (468th) - gas consumption too high for distance travelled after encountering bad weather - bombed secondary target

c. Other reasons (2):

- (1) A/C 587 (444th) - pilot sick - bombed secondary
- (2) A/C 275 (468th) - hit by flak over the primary, damage depressurized A/C and crew missed bombs away - jettisoned.

4. A/C bombing primary target

88

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S E C R E T

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HEADQUARTERS
XX BOMBER COMMAND
APO 493

SECRET

Auth: CG XX BC
Initials K10
Date: 5 Feb 45

CONSOLIDATED
SPECIALIST MISSION REPORT
OF DET. PW FLIGHT ENGINEER

Date Prepared: 5 February 1945

Field Order Number 33
Date of Mission: 1 Feb 45

1. The attached table contains the summary of the performance for the aircraft that bombed the primary targets and returned to their own base.
2. Starting gross weights averaged greater than 134,000 pound. As a result the bomb loads were greater than the loads carried to this target on past missions.
3. Overall performance indicates that the mission was well planned by the Groups.

Incl:
Incl 1 - Summary of Performance, FO #33
Primary Target

SECRET

SUMMARY OF PERFORMANCE
 P. FC #33
 PRIMARY TARGET

GROUP	OVER ALL	40TH	444TH	462ND	468TH
*Number of a/c	77	18	21	20	18
Total time	16:58	17:27	17:25	16:55	16:04
Time to target	9:05	9:13	9:33	9:05	8:25
Fuel Burned	Average 7195 Maximum 7625 Minimum 6750	7270 7500 7000	7160 7400 6930	7240 7625 7000	7110 7300 6750
Fuel Carried	Average 7875 Maximum 7975 Minimum 7720	7915 7975 7900	7790 7900 7720	7900 7900 7900	7900 7900 7900
Burnable Reserve	Average 680 Maximum 1200 Minimum 275	645 900 400	630 950 350	660 1200 275	790 1150 650
** Air Miles	3820	3865	3780	3860	3710
Ground Miles	3762	3785	3760	3814	3685
Gal/ Air Miles	1.89	1.88	1.89	1.88	1.91
***Bombing Altitude	20,500	19,000	19,750	19,000	21,300
Starting Gross Weight	Average 134,630 Maximum 136,105 Minimum 131,191	133,900 134,753 131,191	134,970 136,000 133,168	134,650 136,105 133,200	134,950 136,013 134,280
Weight of Bombs	Average 4330 Maximum 6120 Minimum 4080	4080 4080 4080	4590 6120 4080	4490 5100 4080	4080 4080 4080
No of M-44 Bombs	4.2	4	4.5	4.4	4

* Bombing primary and returning to own bases for which logs were available.
 ** Accuracy of air miles is questionable due to potential errors in method of determination.
 *** Pressure altitude.

DECLASSIFIED
 Authority *AW 760063*
 By *CD NAPA* Date *11/18*

S E C R E T

ANNEX

L

TARGET DAMAGE ASSESSMENT

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

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DECLASSIFIED
Authority *now* 760063
By *CD* NAPA Date *12/1/88*

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

HEADQUARTERS
XX BOMBER COMMAND
Intelligence Section
APO 493

20 February 1945

DAMAGE ASSESSMENT REPORT NO. 41

TARGET: Floating Drydock, Singapore. Alternate principal Target,
Drydock and West Wall Area, Singapore Naval Base Area, Sing-
apore, Malaya. (01° 28'N - 103° 51'E).

GENERAL STATEMENT:

This report relates to damage resulting from a daylight attack by 88 aircraft of XX Bomber Command on the Floating Drydock and Drydock and West Wall Area, Singapore Naval Base, on 1 February 1945. A total of 193 M-44 1000# GP bombs and 183 M-65 1000# GP bombs were dropped. Of this total of 376 bombs dropped, 136 M-44 1000# GP bombs and 146 M-65 1000# GP bombs were directed against the Floating Drydock using the center of the dock as an aiming point; 57 M-44 1000# GP bombs and 37 M-65 1000# GP bombs were directed against the Drydock and West Wall Area using the center of the Drydock gate as an aiming point. Bombing altitudes ranged from 18,500 feet to 21,400 feet over the target from 0209Z to 0322Z. Weather was generally 5/10 undercast throughout the attack. Assessment of damage was accomplished from excellent quality photography, Mission No. 5MR16, obtained by the 468th Bomb Group, XX Bomber Command on 5 February 1945.

Damage to Floating Drydock:

Just prior to the attack the floating dock was partially submerged and the 460' engines aft cargo vessel therein had steam up and was slightly askew. Apparently operations were in progress for the vessel to depart the dock. In the course of the attack the dock received 5 hits between the bulkheads which probably seriously damaged the bottom of the dock and which set fire to the cargo vessel. In addition one hit was scored on the top of the port bulkhead amidships resulting in a 15' x 30' hole. Five near misses were close enough to have caused underwater damage to plates. Reconnaissance several hours after the attack showed the dock to be underwater for approximately 3/4 of its length and the vessel aboard burning furiously in two places. Reconnaissance 4 days after the strike show the dock to be on an even keel but very low in the water; however both tops of the bulkheads are visible for their entire length. As a result of at least one direct hit the cargo vessel was sunk in the dock and is now seen with decks awash. In view of the fact that the dock is probably 75 feet or more from top to keel and the deepest part of the straits shown in this area on charts is no deeper than 70 feet, the dock would not completely disappear from view. All indications are that the dock is resting on the bottom and is out of commission.

Damage to West Wall Area:

Previous attacks had effected damage to buildings amounting to 97,700 sq. ft. or 4.8 percent of the total area of 2,015,600 sq. ft. or 100 percent. This attack shows additional damage to 338,500 sq. ft. or 16.8 percent making a total of 436,200 sq. ft. or 21.6 percent of damage. Of this total damage, 310,500 sq. ft.

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