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MEDITERRANEAN ALLIED TACTICAL AIR FORCE

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BY D. M. Wilkerson
ON 3 Dec 76

MONTHLY AIR INTELLIGENCE AND OPERATIONS BULLETIN

UNCLASSIFIED

[redacted]

VOLUME I, NUMBER 4 FEBRUARY, 1945

US Army AF 142.3167

Instructors Reading this Document

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:Feb.,1945 R.A.F. :
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HEADQUARTERS
MEDITERRANEAN ALLIED TACTICAL AIR FORCE
APO 650.

* * * * * * *

Mediterranean Allied Tactical Air Force, an operational component of Mediterranean Allied Air Forces, is an integrated command mainly composed of United States Army Air Force (Twelfth Air Force) and Royal Air Force (Desert Air Force) units.

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The primary purpose of this Monthly Bulletin is to furnish intelligence and operational information to subordinate units, in order that they may have a better understanding of the over-all picture of Mediterranean Allied Tactical Air Force activities and developments. It is not intended to reproduce in this publication intelligence and operational data previously disseminated by other agencies.

BY COMMAND OF MAJOR GENERAL CANNON:

DOWNGRADED AT 12 YEAR INTERVALS;
NOT AUTOMATICALLY DECLASSIFIED.
DOD DIR 5200.10

R. B. LEES
Air Commodore, R.A.F.
A.A.G.O. (Chief of Staff)

UNCLASSIFIED

OFFICIAL:

D.J. Wiseman

D. J. WISEMAN
Group Captain, R.A.F.
Chief Intelligence Officer.

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HEADQUARTERS

MEDITERRANEAN ALLIED TACTICAL AIR FORCE

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MONTHLY AIR INTELLIGENCE and OPERATIONS BULLETIN NO. 4

SUMMARY OF M.A.T.A.F. OPERATIONS

- FEBRUARY 1945 -

I. GENERAL

Several notable "firsts" were reached by M.A.T.A.F. during the month. The most outstanding of these was the flying of the 500,000th sortie by a M.A.T.A.F. plane on 8 February; no other single air force had previously reached this figure. Ten days later the second anniversary of the establishment of M.A.T.A.F. was celebrated. On 23 February, medium bombers struck further north along the Brenner Pass Line than ever before, when B-25 Mitchells attacked a bridge near Campo di Trens, and two days later pushed still nearer the Reich on this vital line, to the bridge at Vipiteno, six miles due south of the Austrian border.

The most intensive effort of the month's activities continued to be the blockade of Italy. Lines of communication between Italy and the Reich, and those between points within the enemy-held portion of Italy, received consistent and heavy attacks. Attention was given to the destruction of enemy supply dumps and installations, but on a second priority basis. Ground troops received direct close support when required in connection with a number of limited objective attacks.

Weather during the first nineteen days of the month curtailed M.A.T.A.F.'s operations, but five days of exceptionally good weather, beginning on 20 February, made possible more than a thousand sorties a day, which proved to be the most sustained effort since the first part of January. In spite of poor weather, a short calendar month, and the loss of two fighter groups on the 20th and 21st (transferred from the Air Force), the M.A.T.A.F. achievement for the month was an important one, with sorties totaling 19,563.

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Against this continuous air program, the enemy adopted virtually no aggressive aerial action. His flights over our territory were limited to reconnaissance only, and confined mainly to night operations. On only ten occasions were our aircraft attacked while flying over his territory; four of these attacks were against our photo reconnaissance planes.

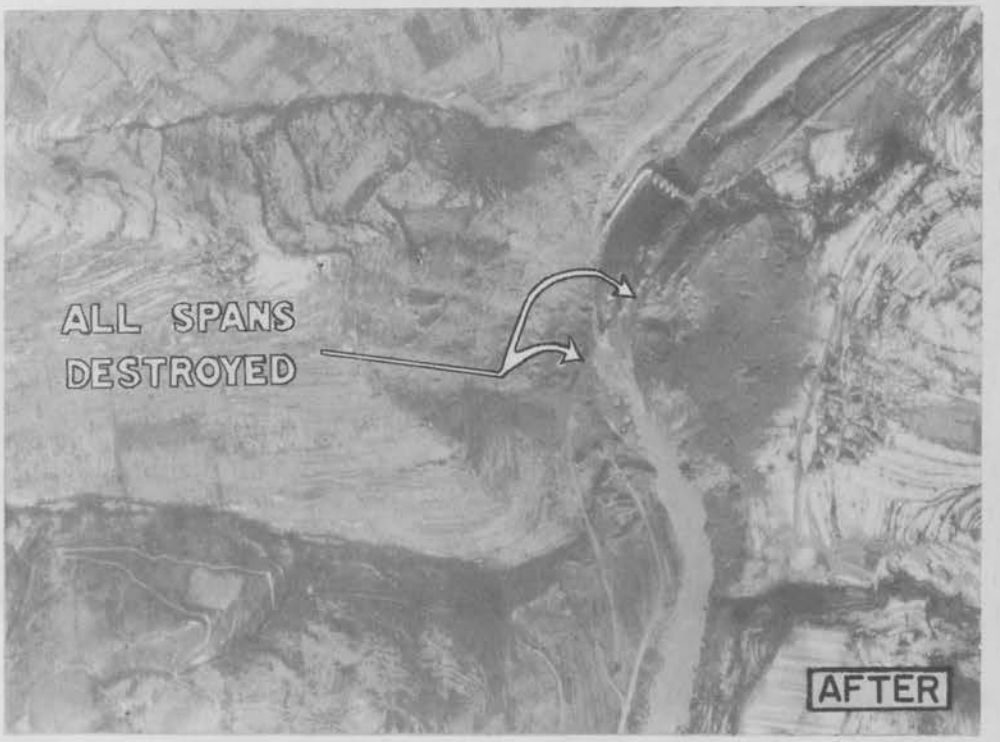
II. LINES OF COMMUNICATION

Destruction of communications in enemy-occupied Italy continued to be M.A.T.A.F.'s primary object. Rail lines were the most important targets; highways and water facilities, although not forgotten, were of second priority. The destruction of bridges and viaducts on the rail lines continued to be the most effective means of stopping enemy movement. Reports indicated that landslides could be very effective blocks, but, although attempted on several occasions, bombing has not always proven successful in creating the desired earth slippage. Two efforts to start slides at San Ambrogio, on 5 and 13 February, were not effective, although slides had covered tracks at San Michele and at Resiutta earlier in the month.

During February, the interdiction became so strict that it seriously hampered the enemy's freedom of moving troops from front to front, at a time when it was most important to him to have that power. It is known that he has sought to move two divisions from the Italian front — 356 Infantry Division and 16 SS P.G. Division. One P/W reported that troops marched from the front lines to Verona before embarking upon transport. At times, however, near Verona, no more than twelve miles could be covered by rail before it was necessary to detrain to get by a block created by M.A.T.A.F. The rear echelons of these units were forced to remain in Italy long after the forward elements had passed the Alps.

The interdiction program is reaching the point where the enemy, instead of having the use of a rail transportation line, has a series of short lines separated by artificially-created blocks, which he finds impossible to eliminate, and around which it becomes unprofitable to ship by other means of transport. Interdiction on the southern portions of the lines, together with good weather toward the end of the month, made it possible to send the bombers farther afield than ever before. Southern Germany and Northern Yugoslavia were visited, and blocks were created on the Brenner Pass Line north of Bolzano. On 23 February B-25's dropped bombs on the north and south rail bridges at Campo di Trens. This spot, about twelve miles south of the Brenner Pass itself, was the farthest north point of the line ever bombed by M.A.T.A.F. units. Two days later the mediums bombed the same two bridges again; although approaches to the bridges were damaged, both remained passable. A 200-foot bridge at Vipiteno, still farther north on the Brenner Pass Line, and only six miles south of the Austrian border, was bombed successfully by B-25's on the same day.

At no time during the month was the Brenner Pass Line open to continuous through traffic. This did not mean that rail traffic was completely stopped, but that it suffered many unscheduled stop-overs while waiting for various blocks to be removed. Medium bombers operated over the line on all but one of

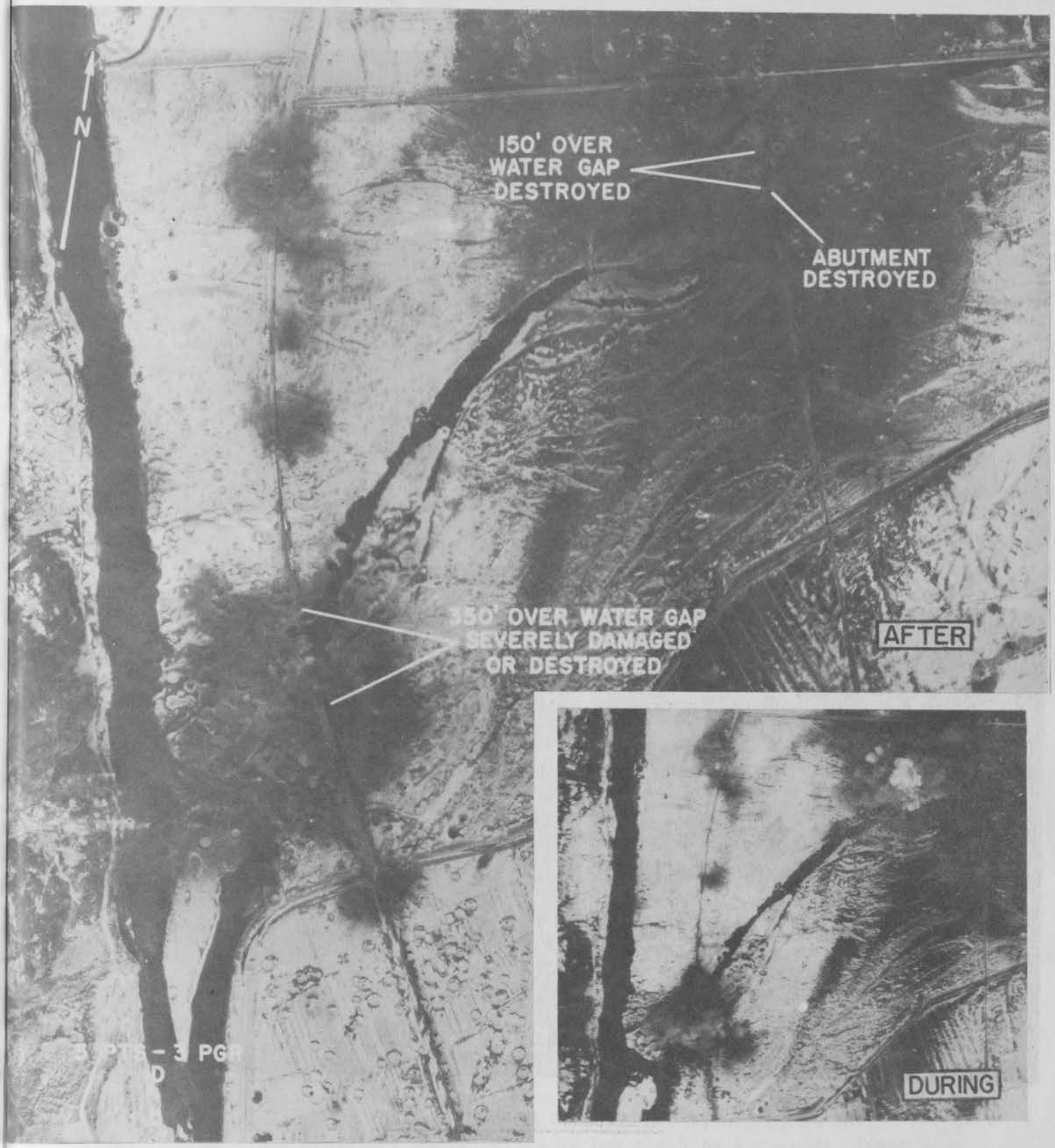


CANALE d'ISONZO RAIL BRIDGE

This important bridge on the Piedicolle Line was partially repaired, following the successful Shoran attack of 31 December 1944, when, on 4 February 1945, two center spans were destroyed by a formation of B-25's of the 57th Bomb Wing. As the result of the third attack on 7 February (shown above), during which 24 B-25's dropped 96 x 1000 lb. G.P. bombs in the target area, the bridge was completely destroyed.

SAN MICHELE RAIL DIVERSION BRIDGE

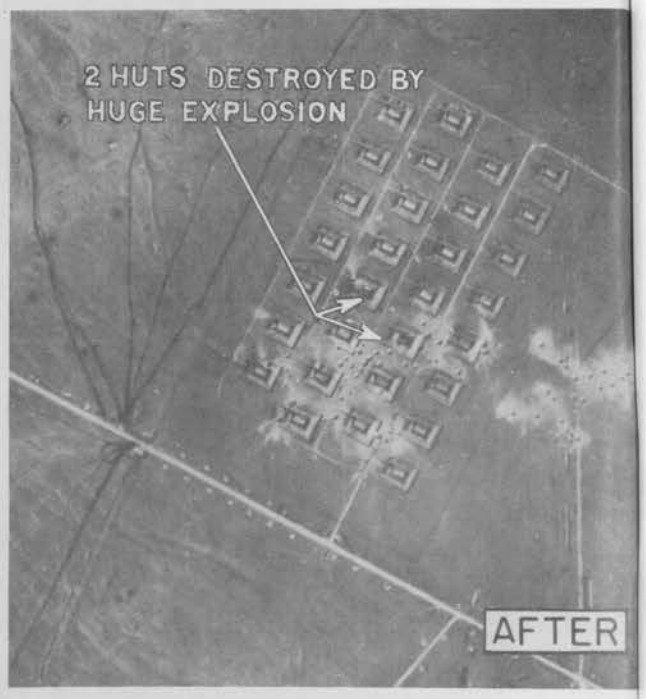
This attack by 18 B-25's of the 57th Bomb Wing on 27 February 1945, completely destroyed the diversion bridge at San Michele. A total of 64 x 1000 lb. G.P. bombs were dropped in the target area. Prior to this attack, the north approach was cut as the result of an attack by B-25's on 26 February.



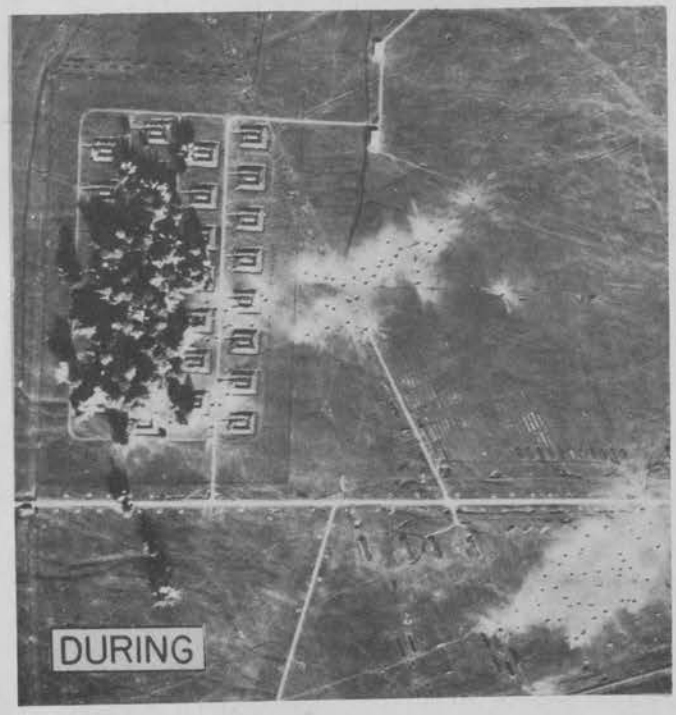
LAVIS VIADUCT AND DIVERSION RAIL BRIDGE

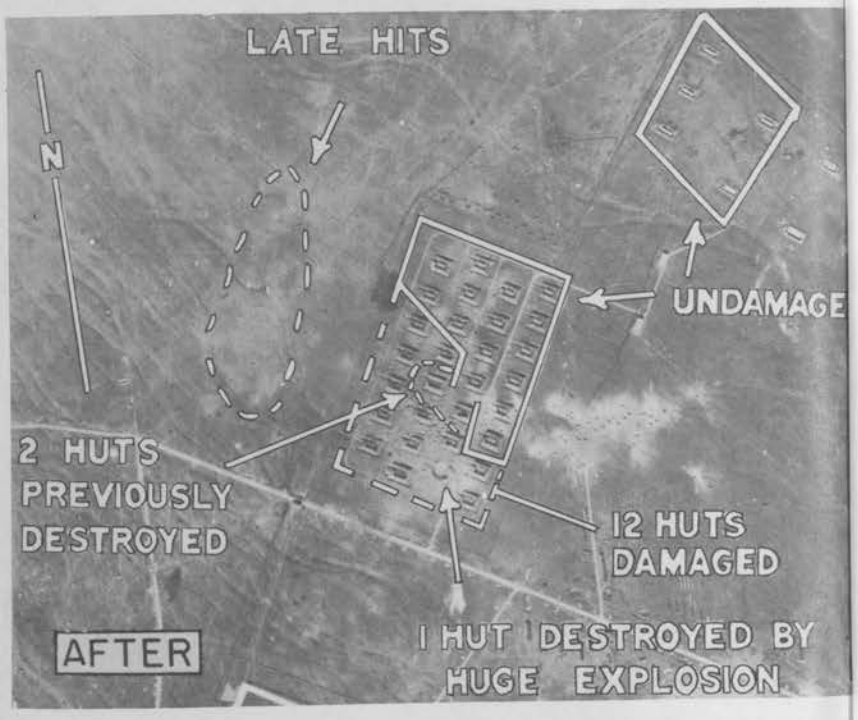
On 7 February 1945 two formations of B-25's of the 57th Bomb Wing made coordinated attacks on these important Brenner Pass Line targets. The viaduct, where 11 B-25's dropped 44 x 1000 lb. G.P. bombs, was seen to have four spans severely damaged or destroyed following the attack, leaving a gap of approximately 450 feet. The second formation of 18 B-25's dropped 120 x 500 lb. G.P. bombs on the southern diversion bridge, completely destroying it and leaving a gap of 150 feet. One span of the viaduct was destroyed prior to this attack.

1ST ATTACK–15 FEB. 1945



2ND ATTACK– 27 FEB. 1945





SPLIMBERGO AMMUNITION DUMP

On 15 February 1945, as shown above, this important target in Northeastern Italy was attacked by 18 B-25's of the 57th Bomb Wing, using Shoran equipment. The destruction of two revetted huts by huge explosions caused three columns of brown and white smoke to rise through the clouds at 10,000 feet. Crews reported feeling the concussion at 13,000 feet.

As the result of a second attack on 27 February 1945, shown below, when visual bombing methods were employed, a third revetted hut was destroyed and twelve others were damaged. A solid blanket of bomb bursts, caused by 525 x 100 lb. G.P. bombs dropped by 24 B-25's, may be seen covering the target area in the "during" photo.

the twenty-two days on which they flew combat missions; more than half of their total month's sorties occurred in 73 attacks over these targets. In addition, fighters and fighter-bombers made more than 200 attacks on the same line. The continuing success of the M.A.T.A.F. interdiction program was shown by the conditions which existed on 26 February. On that date the Brenner Pass Line was blocked in nine places: (1) The line north of the Ala bridge was cut; (2) Both tracks on the approach to San Margherita were cut; (3) Tracks remained cut at Mava San Felice; (4) Cuts on the main and diversion lines at the San Michele rail junction were not repaired; (5) The north abutment of the San Michele bridge was destroyed, the northwest span dropped and the tracks cut; (6) Tracks were cut on the rail diversions at San Michele; (7) The diversion bridge near San Michele was blocked by cratered north approach; (8) The main line tracks were cut south of Magre; and (9) The Vipiteno bridge was impassable, with severe damage to spans.

There was very little traffic into and out of Italy over the three Northeastern Routes, during the month. Photo coverage of this zone of interdiction was difficult to obtain, but it appeared that the damaged viaduct at Borovnica prevented use of the Postumia Line for the entire month. A diversion around the block was under construction, but was not yet completed. The destroyed bridge at Canale d'Isonzo (Bodres), on the Gorizia-Piedicolle line, blocked all traffic for the last three weeks in February. Photo reconnaissance shows the Udine - Tarvisio Line was blocked from 17 February to the end of the month; on the other hand, ground sources state that the block began 7 February. The number of points of interdiction on this line was increased during the excellent weather at the end of the month, and on 23 February it was believed that there were five substantial blocks on this route. Medium bombers flew 339 sorties over these routes during February.

The Tagliamento, Livenza, Piave, Adige, and Brenta Rivers made possible five zones of interdiction in the railway system of the Venetian Coastal Plain. This area was hammered so effectively that on only four days during the month was through traffic possible. Observations indicated that the Germans made no effort to renew use of the coastal railroad. Over the remaining lines, particularly the Vicenza - Nervesa - Udine Line, they were attempting to maintain a large number of diversions and part-time operational bridges. At Legnago and Padua/North the enemy continued the practice of using large cranes to move spans so that bridges would not appear serviceable during daytime reconnaissance.

The Po River bridges were not neglected, when it was necessary to knock out crossings which the enemy had repaired. The Piacenza bridge was rendered impassable on 8 February, and for the remainder of the month no permanent structures east of Torreberetti were capable of carrying heavy traffic. Torreberetti was considered "passable when necessity demands" during the latter part of the month. However, with the concentration on the interdiction program on the Northern Lines, the Po River crossings ceased to be as important as formerly; fewer than 200 sorties were flown by the medium bombers over these targets, mostly as weather alternates. The main Verona - Milan Line remained blocked by cuts at the Serio and Oglio River crossings.

The success of the railroad bombing has meant that an increasing amount of traffic has been inevitably turned to the highways where travel has been mainly by night. Moderately heavy motor traffic has been observed in the Po Valley, the Venetian Coastal Plain, and paralleling the Brenner Pass line. One convoy three miles in length has been seen. Substitution of motor transport for rail indicates that the enemy is using his limited store of automotive fuel, and reducing still further his mobility and attacking powers. Attacks, such as those made by XXII T.A.C., where one hundred vehicles were damaged and then eighty more destroyed when a motor park east of Mantua was set on fire by PTI bombs, did not help his situation. His shortage is made clearly evident by the fact that he is using charcoal gas producing units to furnish fuel for motor vehicles, processing his small supply of natural gas from Italian wells, and using beet sugar refineries in the Po Valley to produce alcohol for the same purpose. These refineries were frequently attacked during February.

The enemy has been utilizing barges for transportation in the Lower Po Valley, and in the canals of the Venetian Plain. On three successive days, beginning on 22 February, Desert Air Force planes destroyed twenty barges and damaged sixty-five more, as part of their interdiction program. During the month, military supplies continued to be transported at night by water from Trieste and Pola to Venice. Heretofore, the historic importance of Venice has saved these vessels and the harbor installations. Now that clearance has been obtained for the harbor area, appropriate targets will be attacked when observed. This leak has been partially offset by blows of heavy bombers from M.A.S.A.F. on the harbors of Trieste, Pola, and Fiume.

The Verona area has been used by the enemy as a "Frontleitstelle", or base area, at which many of the transfers between motor and rail transport have been accomplished, and distribution made of replacement troops and material. Delays of rail traffic on the Lower Brenner Pass Line became so great that much of this transfer work is now apparently done farther north at Bolzano. By reason of the ease with which attacking planes could shift from rail to road targets on the highway paralleling the railroad between Bolzano and Verona, some of this motor traffic now travels north and south along highways to the west of Lake Garda, as well as along a road net developed at some distance to the east of the Brenner Pass Rail Line.

The month has seen extensive use of butterfly bombs to combat the enemy's efforts to repair rail bridges and track damage. Fear that somewhere in the debris butterfly bombs may possibly be hidden, which will explode at the least movement, cannot help but retard the labor of repair crews. Indicative of the transportation shortage is the fact that horse and ox drawn vehicles were used in increasing numbers in front areas for the carriage of supplies. In some cases a considerable number of troops used cycles for transport in those areas.

III. CLOSE SUPPORT

Close support missions, except to assist advances of our own troops, or in opposition to local enemy advances, occupied a secondary priority in the air effort, due to the continued period of inactivity on the whole front. Three

TRAVO ROAD BRIDGE

On 5 February 1945, [redacted] by P-47's of XXII T.A.C. Travo is located just west of State Road No. 45, approximately 15 miles southwest of Piacenza.

CAMPO SAMPIERO RAIL OVERPASS

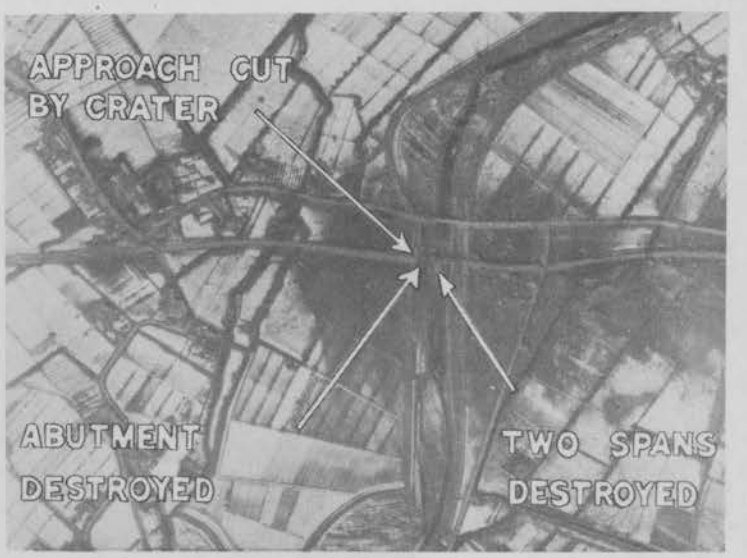
This rail overpass bridge, located at Campo Sampiero, 12 miles north of Padua, was completely destroyed by P-47 fighter-bombers of XXII T.A.C. on 8 February 1945.

MEZZOCORONA AMMUNITION DUMP

Ten buildings in this ammunition dump were destroyed as the result of direct hits by dive-bombing P-47's of XXII T.A.C. on 26 February 1945. Mezzocorona is located in the Adige Valley, northwest of San Michele.

MABELLINI MARSHALLING YARDS

This small railway yard on the Brescia - Peschiera Line was attacked on 30 January 1945 by P-47 fighter-bombers of XXII T.A.C. Seven wagons were destroyed or damaged, and the tracks were cut in four places. As the result of an explosion, a small building was set on fire.



LISIERA RAIL BRIDGE

This bridge, on the main East-West Rail Line, 4 miles northeast of Vicenza, was destroyed by fighter-bombers of XXII T.A.C. on 7 February 1945. A reconnaissance photo, taken by the 3rd Photo Group following the attack, shows that two spans and one abutment were destroyed, while the approach was cut by a crater.

FORNOVO DI TARO RAIL BRIDGE

As the result of a dive-bombing attack on 24 February 1945 by P-47's of the 1st Brazilian Fighter Squadron, the fourteenth span from the northwest end of this rail bridge was completely destroyed. Fornovo di Taro is located on State Road No. 62, approximately 14 miles southwest of Parma.

TRAIN AT POLJCANE, YUGOSLAVIA

Rocket-firing P-47's of Desert Air Force attacked this train at Poljcane in Northern Yugoslavia on 26 February 1945. Part cover shows that seven of twelve M/T loaded on flats are burning.

RAIL CARS AT MOLZBICHL, AUSTRIA

Approximately 106 rail cars on a siding near Molzbichl, on the main Spittal - Villach Line were attacked on 27 February 1945, by P-47's of Desert Air Force. Smoke hinders interpretation, but at least 50 of these cars appear to be on fire.

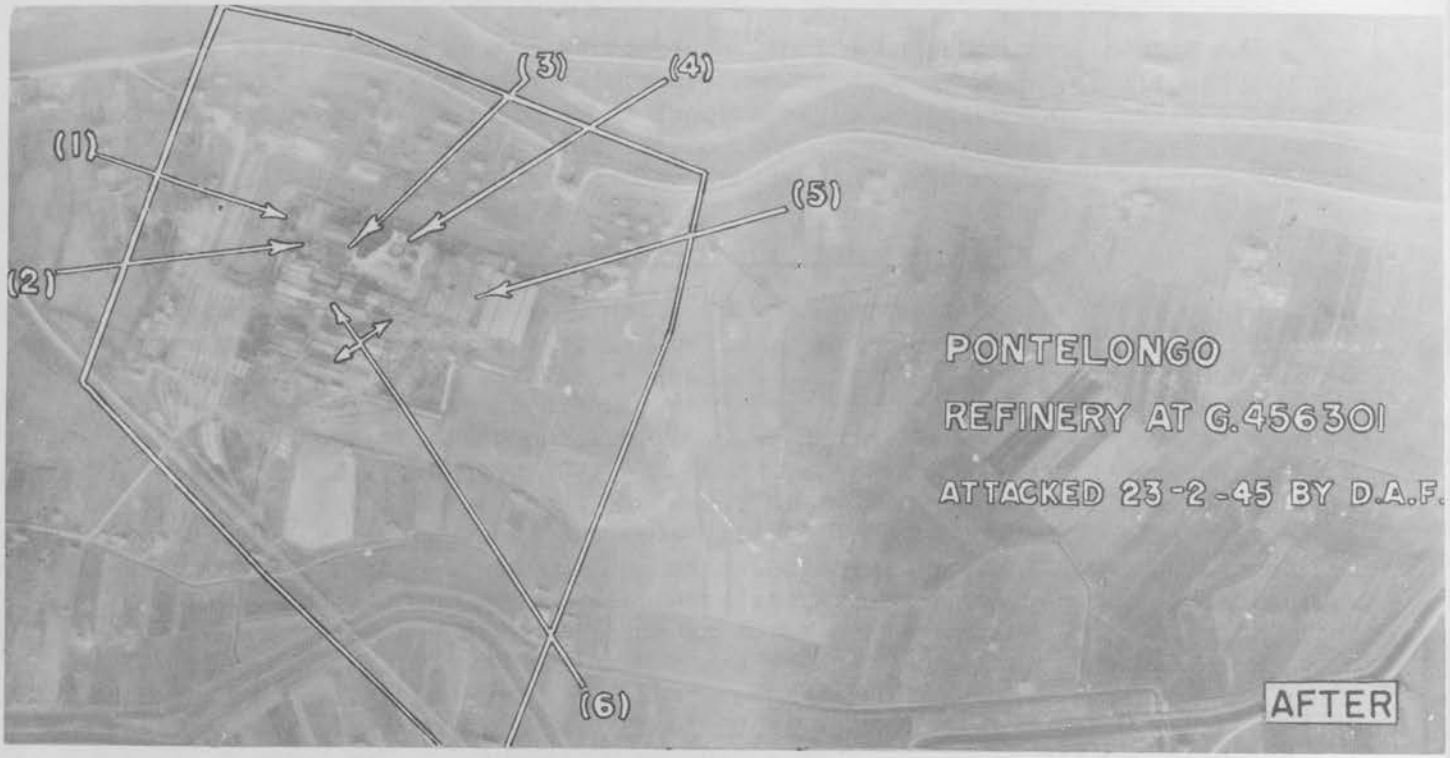
times during the month the air forces were assigned close support roles to attacks by ground units. On 8 February, the 92nd Infantry Division moved forward toward limited objectives in the Serchio Valley. Approximately one-third of the total 603 sorties flown by XXII T.A.C. planes on that day were devoted to close support on this front. Troop concentrations, gun positions, observation points, ammunition and fuel dumps, were attacked by strafing, firing of rocket projectiles and anti-personnel bombs. Fuel tank incendiaries were used very successfully against gun positions, occupied buildings and supply dumps. At one site, P-47's caused a very heavy explosion by skip-bombing a railroad tunnel, believed to be sheltering an ammunition train. Approximately thrity-five air attacks were pressed home on gun positions, and an additional twenty on occupied buildings in the first day of this attack. Such support was continued until the local operation to improve positions had obviously failed.

The 10th Mountain Division and the Brazilian Expeditionary Force of the Fifth Army launched an attack on 20 February in the Monte Belvedere section. Fighters and fighter-bombers of XXII T.A.C. rendered vigorous support to this action by attacking the usual close support targets. Much of the work was done under Rover Joe control. During three days of such support more than sixty attacks were made against gun positions, and an additional sixty-five were made on towns and buildings occupied by enemy troops. Extensive use was again made of rocket projectiles and fuel tank incendiaries.

The Eighth Army launched a limited objective attack on the night of 23 February to eliminate enemy pockets tenaciously held on the east flood bank of the Senio River. DAF supplied close support in the form of attacks on gun positions, preparatory to the assault, and, on the next day, flew one hundred and fifteen sorties in support of this ground effort.

IV. DESTRUCTION OF ENEMY SUPPLIES AND INSTALLATIONS

While curtailing the shipment of supplies by means of railroad interdiction was the principle device used to affect their volume, attacks upon supply dumps were not stopped. Ammunition and fuel dumps were destroyed by M.A.T.A.F. during the close support missions flown for the ground forces in the three limited objective attacks of the month. Dumps constituted alternate targets for the fighter and fighter-bombers, and were attacked as opportunities arose. DAF aircraft bombed a 5,000-ton tanker in Trieste Harbor on 4 February. Oil and sugar refineries throughout the Po Valley were vigorously attacked. On one occasion the sugar refinery at Legnago was bombed by use of Shoran, and many small explosions were reported in the target area, along with much smoke. A large ammunition dump at Spilimbergo in Northeastern Italy was bombed by the 57th Bomb Wing on 15 February, using Shoran through a complete overcast. This resulted in three large columns of smoke which rose above the overcast, and the concussion was felt by the bombers flying at 13,000 feet. Mitchell bombers again successfully attacked Spilimbergo ammunition dump on 27 February. The Sesto Calende Assembly Plant, making small naval assault craft, was bombed by visual methods on 24 and 25 February; seventy-five percent of the buildings in one area were damaged or destroyed and fifteen percent in the other area.



PONTELONGO SUGAR REFINERY

This target, located about 13 miles southeast of Padua, suffered considerable damage as the result of the successful attack on 23 February 1945, made by 19 Marauders of the Desert Air Force. A total of 107 x 500 lb. and 62 x 250 lb. bombs was dropped. The damage, as shown in the lower photo, included the following: (1) Storage building gutted; (2) Shed partially destroyed; (3) Boiler house severely damaged; (4) Top of tank blown off; (5) Roofing of storage buildings largely destroyed; and (6) Refinery plant severely damaged and about 1/4 of roofing destroyed.

CONEGLIANO MARSHALLING YARDS

Attacked on 19 February 1945 by 39 Marauders of Desert Air Force, this marshalling yard, located some 16 miles northeast of Trevisio, was well covered, with most of the bombs dropped falling in the target area.

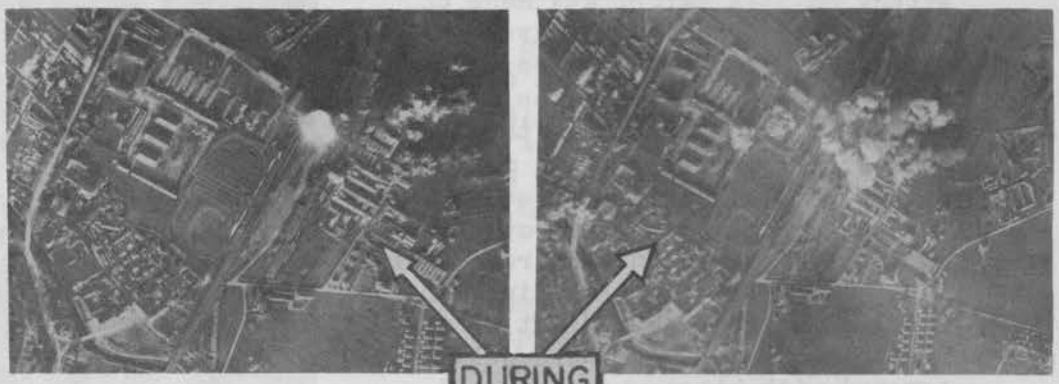


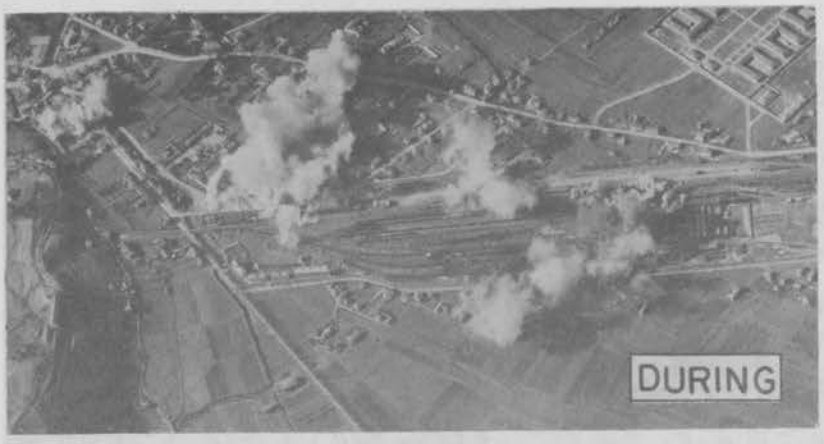
Photo reconnaissance revealed that the following damage resulted from this attack:

(a) 15 wagons were destroyed.
(b) 2 coaches were damaged.
(c) 2 sheds were destroyed.
(d) The station buildings were gutted.
(e) A large shed was severely damaged.
(f) 2 barracks-type buildings were gutted.
(g) 2 barracks-type buildings were damaged.

(Note probable ammunition explosion shown on one of the strike photos.)

GORIZIA MARSHALLING YARD

(MONTE SANTO STATION)



IST ATTACK

This marshalling yard was first attacked by 32 Marauders of the Desert Air Force on 8 February 1945. The photo on the left, taken during the attack, shows an excellent concentration of bombs, with several direct hits on the rail lines. During this attack a total of 113 x 1000 lb. bombs was dropped.

2ND ATTACK

The second Desert Air Force attack on this target was made on 20 February 1945, by 27 Marauders. The first and second photos on the right were taken during the attack, and the third photo shows the actual bomb strikes. Fires, with multi-colored smoke, were reported by returning aircrews, and direct hits on the rail lines and railroad cars were also observed. Buildings in the locomotive repair depot on the east side of the yard were well covered with hits, which started several fires. During this attack, which was made from an altitude of 11,000 feet, 155 x 500 lb. and 103 x 250 lb. bombs were dropped.

A considerable amount of destruction of supplies and equipment was effected in marshalling yards and railroad sidings, by bombing and strafing. The interdiction program against the rail lines brought about stoppage of trains all along the routes. Use was made of sidings and tunnels for protection, but large numbers of loaded rail cars were to be seen along the open lines and in the marshalling yards. A definite policy of attacking such targets on all Northern Italian railroad lines, for the purpose of destroying cars and locomotives and the loaded supplies was followed. Blockage of the lines in marshalling yards, although it occured, was of secondary importance. More than 100 locomotives were destroyed, and 288 were damaged; railway cars destroyed totaled 769, and 2,168 were damaged.

The satisfactory condition of the rail interdiction program, plus the good weather in the latter part of the month, made possible the bombing of more targets in Southern Austria and Yugoslavia. Desert Air Force, flying a total of 428 sorties over Yugoslavia, attacked rail bridges and traffic on the lines running from the Austrian border to Ljubljana and Zagreb. This, in conjunction with the fact that the rail blocks in Italy created congestion in the yards in Southern Austria, created profitable targets. The destruction of supplies and railroad equipment was increased by attacks on the marshalling yards and rail lines of Linz, Villach, and Klagenfurt. The Fifteenth Air Force carried on the major volume of these attacks, with DAF participating during the good weather in the latter part of the month; on the last two days of the month DAF made 87 sorties into Southern Austria.

V. NICKELLING, PARTISAN AID AND PATIENT EVACUATION

Leaflet dropping continued to be performed both by day and night during the month, by planes of DAF, XXII T.A.C., and the 57th Bomb Wing. Areas receiving distribution most often were La Spezia - Massa, Bologna - Ferrara, and Verona. Lieutenant General Mark W. Clark's message of 16 February to the people of Northern Italy, advising them to stay away from communications and industrial targets to escape the hazards of Allied bombing, was widely distributed in leaflet form.

Partisans received approximately fifty percent more supplies during February than in the preceeding month, from supply dropping missions of the 51st Troop Carrier Wing, which totaled 304 tons. Liaison difficulties with and within the underground Partisan organization were still the greatest difficulty in carrying out this program, since sixty-two planes returned to their bases with supplies intact due to the fact that no reception signals were received from the drop zones. By far the larger part of the Wing's assignments consisted of non-combat flying for the transport of mail, freight, and passengers. More than 1900 patients were evacuated during the month in this non-combat duty.

STATISTICAL SUMMARY

- FEBRUARY 1945 -

With a short month and weather preventing all but one day of a thousand sorties or more prior to the twentieth of the month, aircraft of M.A.T.A.F. flew 18,507 combat sorties during February, as compared with 19,325 during January.

Improved weather during the latter part of the month brought 6 days of a thousand sorties, and claims of disruption to the enemy's lines of communication mounted considerably. A total of 1,386 motor transport and armored vehicles and 222 bridges were destroyed or damaged during the month, and more than 725 road and rail blocks created.

Medium bombers of the 57th Bombardment Wing actually had their best month of the winter. Operating on 22 days, they destroyed 17 bridges, damaged 13 more, and blocked approaches to 42. A total of 3,727 tons of bombs was dropped by this Wing, compared to less than 3,000 tons dropped by the three Groups now in the Wing during any of the preceding three months.

A recapitulation of pilots' claims for February is as follows:

TYPE OF TARGET	DESTROYED	DAMAGED
Road and Rail Bridges	76	146
Road Blocks and Rail Cuts	735	-
Tunnels	1	3
M/T and Armored Vehicles	612	774
Locomotives	64	341
Rolling Stock	735	2300
Fuel Dumps	6	-
Ammunition Dumps	20	-
Other Supply Dumps	2	-
Factories	13	20
Buildings Exploded or Burning	45	-
Ships and Small Boats	41	146

OPERATIONAL UNITS UNDER MEDITERRANEAN ALLIED TACTICAL AIR FORCE

- FEBRUARY 1945 -

Unit	Type A/C	Ave. No. A/C Asgd.	Ave. No. A/C Oper	No. Oper. Days	No. of Sorties	Tons of Bombs	Victories* Des-Prob-Dam	No. A/C Lost
MATAF								
3 Photo Gp (2 Sqds)	F-5	36	30	23	321			
	B-25	2	2	8	11			
	A-20	1	1	-	-			
XXII TAC								
62 Ftr Wing								
414 NF Sq.	BEAU	6	2	-	-			
	P-61	6	5	26	122	4		1
416 NF Sq.	MOSQ	10	5	22	74			
350 Ftr. Gp.	P-47	91	65	26	1820	755	A:2-0-0 G:2-0-15	9
1 Brazilian Ftr. Sq	P-47	27	22	21	328	165		5
27 Ftr. Gp.	P-47	89	60	11	588	262	A:3-0-4	4
57 Ftr. Gp.	P-47	89	52	27	1842	840	A:0-0-1	15
86 Ftr. Gp.	P-47	88	65	14	790	373		2
8 SAAF Wing	SPIT	39	35	22	986	192		7
	KITTY	15	14	21	365	130		2
208 T/R Sq.	SPIT	16	15	20	280			
225 T/R Sq.	SPIT	16	15	21	282			
47 B. Gp.	A-20	68	50	22	828	967		6
	A-26	10	6	13	36	69		
12 Photo Sq.	F-5	18	13	22	194			1
DESERT AIR FORCE								
MCRU "A"								
79 Ftr. Gp.	P-47	89	66	20	1146	550		5
239 Wing	MUST.	62	54	15	585	392		8
	KITTY	32	29	14	306	159		3
244 Wing	SPIT	77	73	17	1107	174	A:1-2-0	5
324 Wing	SPIT	61	54	16	802	125	A:0-1-0	7
3 SAAF Wing	MARAUD	68	62	9	451	705		1
253 Wing	BALT.	49	42	9	82	56		1
232 Wing	BOST.	60	50	15	383	296		14
7 SAAF Wing	SPIT	63	55	23	927	56		4
600 NF Sq.	BEAU	6	5	15	29			
	MOSQ	11	8	8	19			
256 NF Sq.	MOSQ	8	6	3	5			
285 Recon Wing	SPIT	37	32	21	602			
57 BOMB WING								
310 B. Gp.	B-25	90	74	21	962	1280	A:5-0-0	
321 B. Gp.	B-25	83	71	19	954	1348		8
340 B. Gp.	B-25	85	73	20	916	1099		6
MISCELLANEOUS (FLT.SECTS.)				18	36			
51 TROOP CARRIER WING**								
60 T. C. Gp.	C-47	72	65	25	704			
62 T. C. Gp.	C-47	71	60	28	1422			1
64 T. C. Gp.	C-47	71	63	28	963			2

N.B. 27 Ftr. Gp., operations for Feb. 1-20; 86 Ftr. Gp., Feb. 1-21; 256 NF Sq. Feb.25-28.

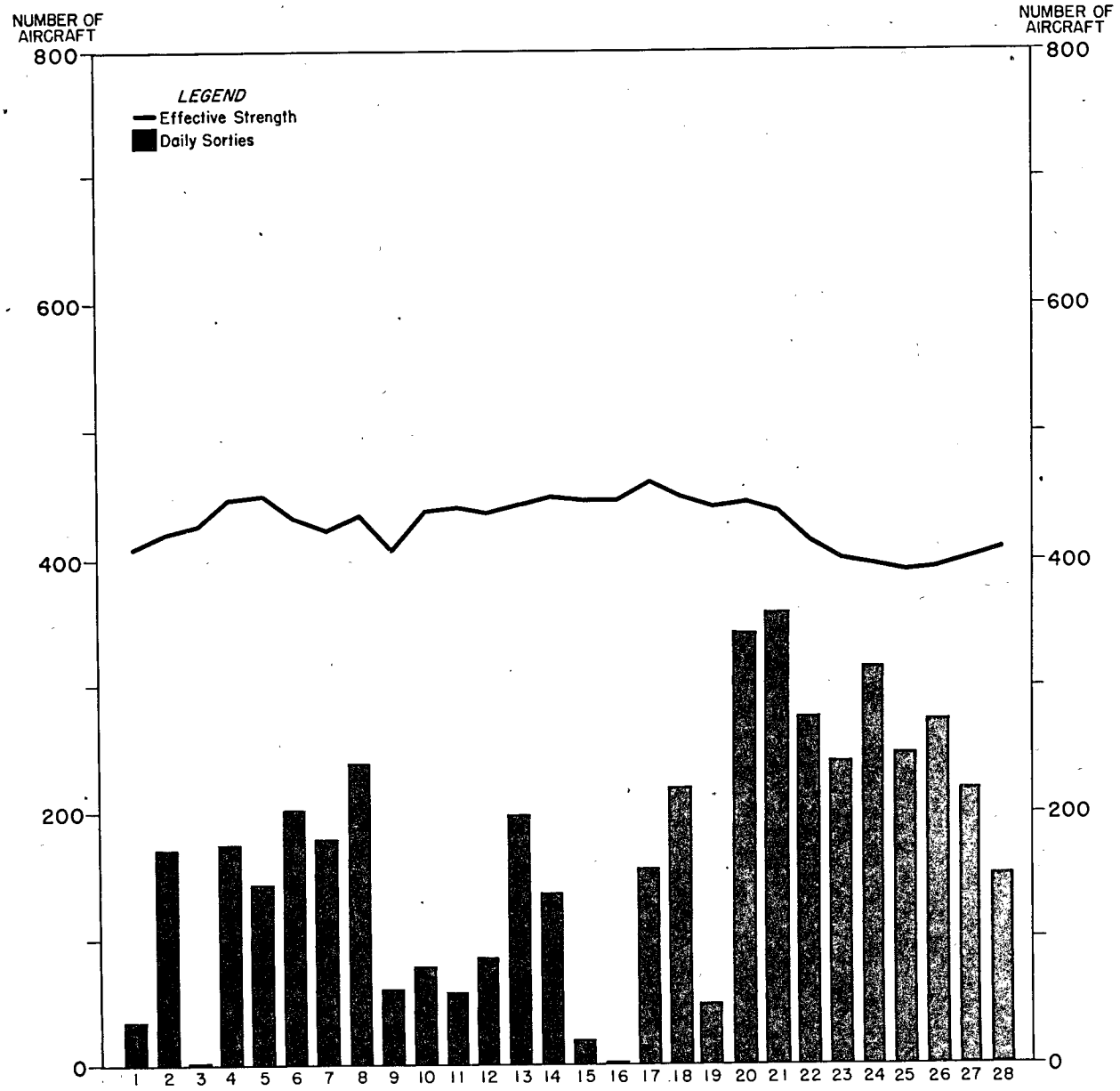
* Victories - A: in Air; G: On Ground.

** Includes all sorties and all losses.

UTILIZATION OF MEDIUM & LIGHT BOMBER STRENGTH

MEDITERRANEAN ALLIED TACTICAL AIR FORCE

FEBRUARY 1945



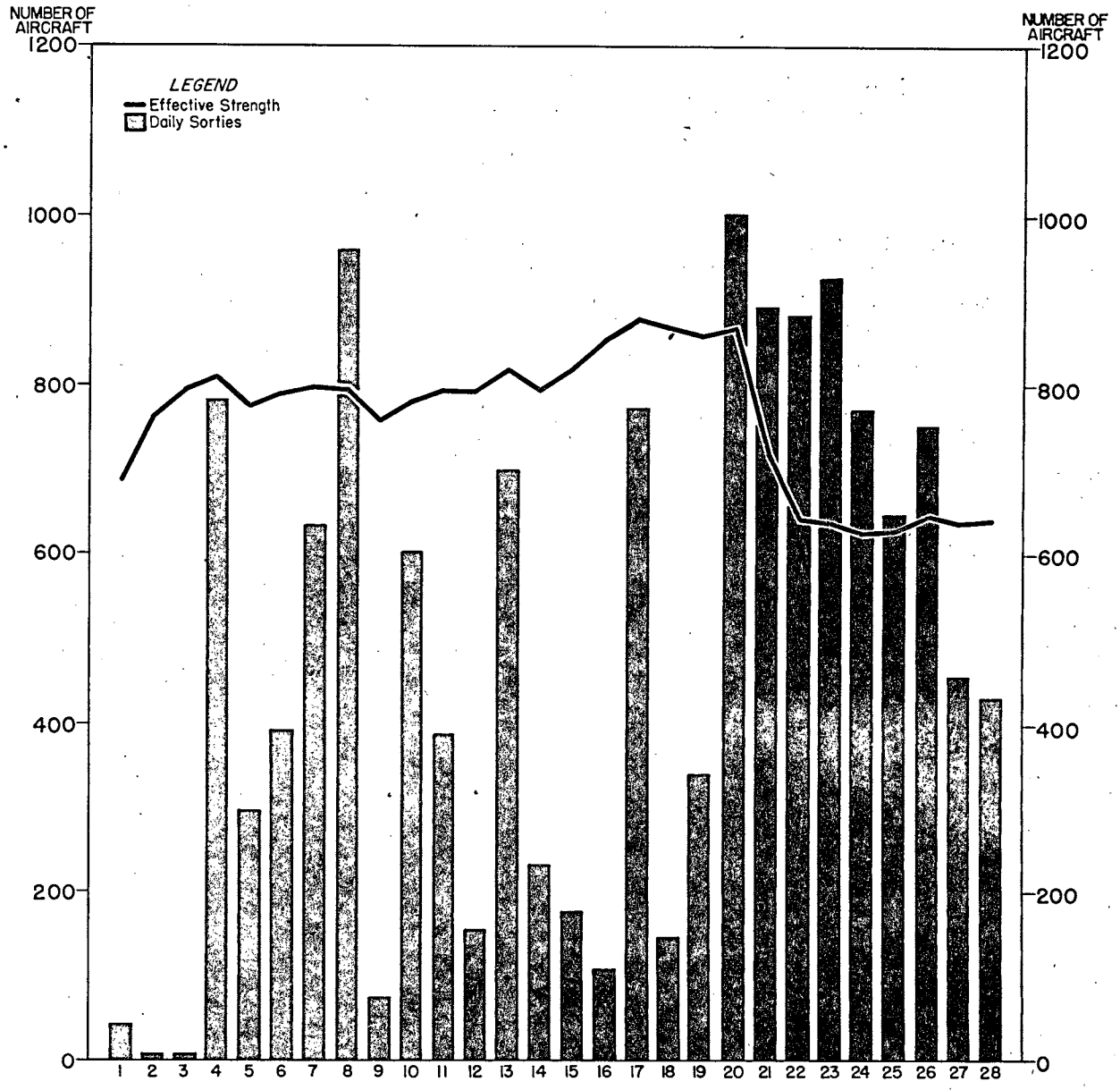
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	DAY
EFFECTIVE STRENGTH	408	419	425	445	447	431	422	433	407	436	439	436	441	447	EFFECTIVE STRENGTH
DAILY SORTIES	34	170	1	174	143	201	181	238	60	79	57	85	199	136	DAILY SORTIES

DAY	15	16	17	18	19	20	21	22	23	24	25	26	27	28	DAY
EFFECTIVE STRENGTH	445	445	460	447	439	444	437	416	401	394	391	393	401	409	EFFECTIVE STRENGTH
DAILY SORTIES	20	1	155	219	48	342	358	275	241	315	247	273	220	151	DAILY SORTIES

UTILIZATION OF FIGHTER & FIGHTER-BOMBER STRENGTH

MEDITERRANEAN ALLIED TACTICAL AIR FORCE

FEBRUARY 1945



DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	DAY
EFFECTIVE STRENGTH	680	762	795	805	775	789	798	795	757	778	794	791	817	795	EFFECTIVE STRENGTH
DAILY SORTIES	41	8	8	781	292	390	630	958	71	602	387	153	695	231	DAILY SORTIES

DAY	15	16	17	18	19	20	21	22	23	24	25	26	27	28	DAY
EFFECTIVE STRENGTH	819	850	874	864	855	868	724	641	637	627	628	647	638	640	EFFECTIVE STRENGTH
DAILY SORTIES	177	104	779	146	337	1011	895	885	929	774	649	755	458	433	DAILY SORTIES

REVIEW OF THE WEATHER

SYNOPSIS OF CLOUD COVERAGE OVER NORTHERN ITALY

- FEBRUARY 1945 -

Northern Italy has been divided into four areas (1,2,3, and 4) for purposes of this report. These are indicated on the map. For each of these areas a separate report in graph form has been prepared, showing cloud coverage with bases below 14,000 feet. Cloud coverage indicated is the daily mean coverage between 0600Z and 1800Z hours.

During the month of February 1945, there were two different general weather situations affecting Northern Italy, with a period of transition between the two situations.

a. (1/14 February) A generally westerly flow of air on the surface prevailed throughout this period. The Azores high pressure cell had receded to the south allowing storms to move over Southern Europe and penetrate south of the Alps into the Mediterranean region. During periods of temporary clearing between fronts, there were five operational days (5/10 or less cloud coverage below 14,000 feet) over Areas No. 1 and 2, one day over Area No. 3, and two days over Area No.4.

b. (15/21 February) This was a period of transition from a definite westerly flow of air at the surface to a definite easterly flow, and it was characterized by generally rising pressure over Europe with small high pressure areas moving from west to east. During this period, there were three operational days (5/10 or less cloud coverage below 14,000 feet) over Area No. 1, two days over Areas No.2 and 4, and three days over Area No.3.

c. (22/28 February) This was a period of definite easterly flow of air at the surface, with a high pressure wedge over Southern Europe preventing storms from penetrating south of the Alps into the Mediterranean region. During this period there were seven operational days (5/10 or less cloud coverage below 14,000 feet) over Areas No.1 and 2, four days over Area No.3, and five days over Area No.4.

In summary, for the month of February, 1945, there was a total of fifteen operational days (5/10 or less cloud coverage below 14,000 feet) over Area No.1, fourteen days over Area No. 2, eight days over Area No.3, and nine days over Area No. 4.

FEBRUARY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
PRECIPITATION	•		•						•																			
VISIBILITY	6	7	6	7	7	8	7	8	6	7	8	8	7	6	7	6	6	6	7	8	6	7	7	7	7	6	7	6
8 - 10/10																												
5 - 8/10																												
2 - 5/10																												
0 - 2/10																												

AREA NO. 1

FEBRUARY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
PRECIPITATION	•		•		•				•					•														
VISIBILITY	4	4	4	5	4	6	6	7	6	6	7	7	5	5	4	6	5	6	6	8	6	7	7	6	6	6	7	6
8 - 10/10																												
5 - 8/10																												
2 - 5/10																												
0 - 2/10																												

AREA NO. 2

FEBRUARY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
PRECIPITATION	•		•						•	•	•	•		•														
VISIBILITY	5	5	5	5	2	6	5	7	5	5	6	7	6	5	4	5	6	6	6	8	6	7	6	6	5	5	5	5
8 - 10/10																												
5 - 8/10																												
2 - 5/10																												
0 - 2/10																												

AREA NO. 3

FEBRUARY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
PRECIPITATION	•		•						•	•▼	•	•		•														
VISIBILITY	6	7	5	6	6	7	6	8	5	6	6	7	7	6	6	7	6	6	7	8	7	7	7	8	7	7	6	7
8 - 10/10																												
5 - 8/10																												
2 - 5/10																												
0 - 2/10																												

AREA NO. 4

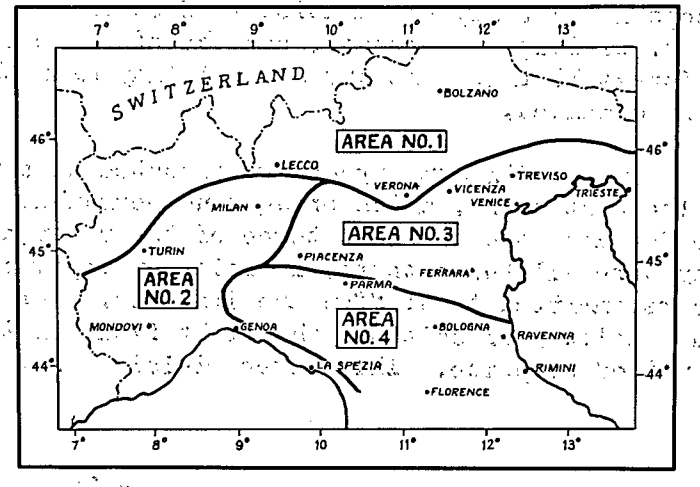
GRAPH SHOWING CLOUD COVERAGE OVER NORTHERN ITALY - FEBRUARY 1945

VISIBILITY CODE

① - LESS THAN 1/8 MILE
② - 1/8 TO 5/16 MILE
③ - 5/16 TO 5/8 MILE
④ - 5/8 TO 1 1/4 MILES
⑤ - 1 1/4 TO 2 1/2 MILES
⑥ - 2 1/2 TO 6 MILES
⑦ - 6 TO 12 MILES
⑧ - 12 TO 30 MILES

PRECIPITATION CODE

• - RAIN
* - SNOW
•* ▼ - SHOWERS (RAIN OR SNOW)



ENEMY GROUND DISPOSITIONS AND OPERATIONS

- FEBRUARY 1945 -

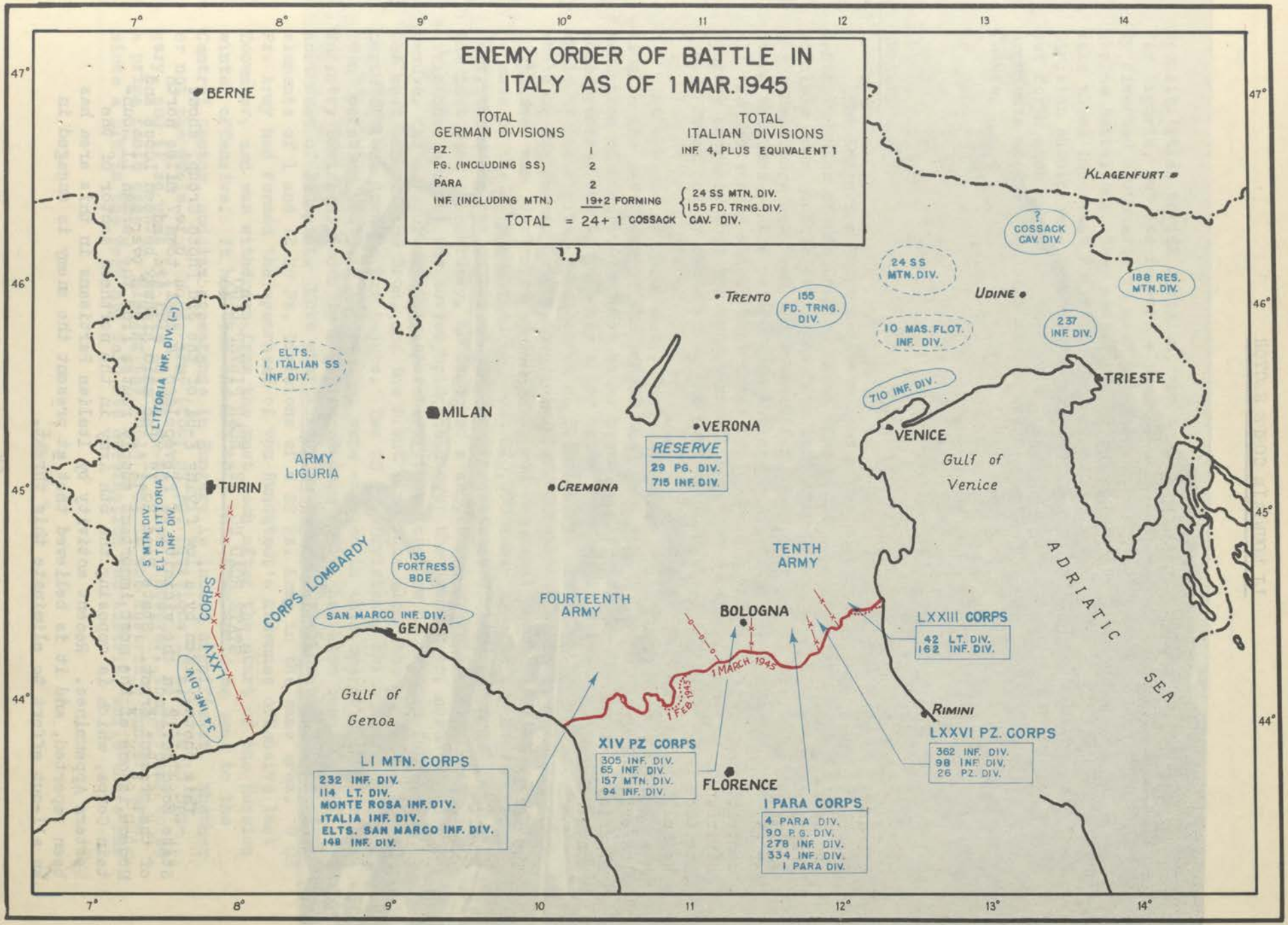
(Prepared by G.S.I., 15th Army Group)

I. ITALY

Another division climbed out over the Alps last month to join in the defense of the Fatherland — Himmler's own 16 SS Panzer Grenadier Division. Its trains were making their tortuous way past the obstructions on the Brenner and Tarvisio Routes for the greater part of the month, and the reduction in traffic during the last week shows that no other division is following closely on its heels. However, the two divisions already despatched since the start of the Russian offensive (356 and 16 SS P.G.) can hardly be the total of Italy's contribution, and various regroupings in the 10th Army suggest that another division is at least being made available. Nevertheless, the enemy's general attitude remains unchanged, and in spite of a flood of rumors of withdrawal, he holds all his positions firmly. Even Northwestern Italy, where evacuation has been more consistently and confidently forecast than elsewhere, retains its original garrison. It even appears that some reinforcement, at least of Liguria, was intended but was subsequently diverted to meet our attack on Monte Belvedere.

Opposite the 8th Army, there have been changes in the Order of Battle. The gap left by 16 SS P.G. Division at the beginning of the month was filled by extending the sector of neighboring formations. This took some time and involved a good deal of reshuffling, which was not complete when a new major change occurred, with the relief of 278 Division by 26 Pz. Division towards the end of the third week of February. It is a little strange that the latter should be committed to a static role, especially as an infantry division, 715 Division, was being relieved at the same time or shortly after. The troops had a ready explanation — Kesselring expected to be ordered to send 26 Pz. Division to Germany, and therefore he hastily committed it in the line to forestall this. At any rate, it may mean that another infantry division is being demanded.

On the 5th Army Front, we executed an attack at the beginning of the month on the west coast, which brought no permanent gains in terrain, but which obliged the Germans to deploy all three of the regiments of 148 Division to meet it. They were all three there, in spite of reports of withdrawal, and had to be hastily recommitted to stiffen the Italians. Our attack on Monte Belvedere and Monte della Torraccia hit the right flank of 232 Division and achieved a fair amount of surprise. 114 Jaeger Division, having handed over its coastal re-


ENEMY ORDER OF BATTLE IN ITALY AS OF 1 MAR. 1945
TOTAL GERMAN DIVISIONS
PZ. 1
PG. (INCLUDING SS) 2
PARA 2
INF. (INCLUDING MTN.) 19+2 FORMING
24 SS MTN. DIV.
155 FD. TRNG. DIV.
CAV. DIV.
TOTAL = 24+ 1 COSSACK
TOTAL ITALIAN DIVISIONS
INF. 4, PLUS EQUIVALENT 1
BERNE
KLAGENFURT
? COSSACK CAV. DIV.
24 SS MTN. DIV.
188 RES. MTN. DIV.
TRENTO
155 FD. TRNG. DIV.
UDINE
10 MAS. FLOT. INF. DIV.
237 INF. DIV.
LITTORIA INF. DIV. (-)
ELTS. 1 ITALIAN SS INF. DIV.
TRIESTE
710 INF. DIV.
MILAN
VERONA
VENICE
RESERVE
29 PG. DIV.
715 INF. DIV.
ARMY LIGURIA
Gulf of Venice
TURIN
CREMONA
5 MTN. DIV. ELTS. LITTORIA INF. DIV.
CORPS LOMBARDY
135 FORTRESS BDE.
TENTH ARMY
ADRIATIC SEA
SAN MARCO INF. DIV.
GENOA
FOURTEENTH ARMY
BOLOGNA
LXXIII CORPS
42 LT. DIV.
162 INF. DIV.
1 MARCH 1945
1 FEB. 1945
LXXV CORPS
3 A.A. DIV.
Gulf of Genoa
RIMINI
LXXVI PZ. CORPS
362 INF. DIV.
98 INF. DIV.
26 PZ. DIV.
LI MTN. CORPS
232 INF. DIV.
114 LT. DIV.
MONTE ROSA INF. DIV.
ITALIA INF. DIV.
ELTS. SAN MARCO INF. DIV.
148 INF. DIV.
XIV PZ CORPS
305 INF. DIV.
65 INF. DIV.
157 MTN. DIV.
94 INF. DIV.
FLORENCE
I PARA CORPS
4 PARA DIV.
90 P.G. DIV.
278 INF. DIV.
334 INF. DIV.
1 PARA DIV.
7° 8° 9° 10° 11 12 13 14
47° 46° 45° 44°

STATE ROAD NO. 12, NEAR PIEVEPELAGO

This photo, taken by a low flying F-5A of the 3rd Photo Group, shows State Road No.12 in the vicinity of Pievepelago, a small town 7 miles north of the present front. State Road No.12, the main highway between Lucca and Modena, is one of the most important supply routes from the German LI Mountain Corps, which is opposing the 5th Army in the northern sector of the Western Appennines. Recent activity by Italian Partisans in this area has been reported, and it is believed that at present the enemy is engaged in an all-out effort to eliminate this threat.

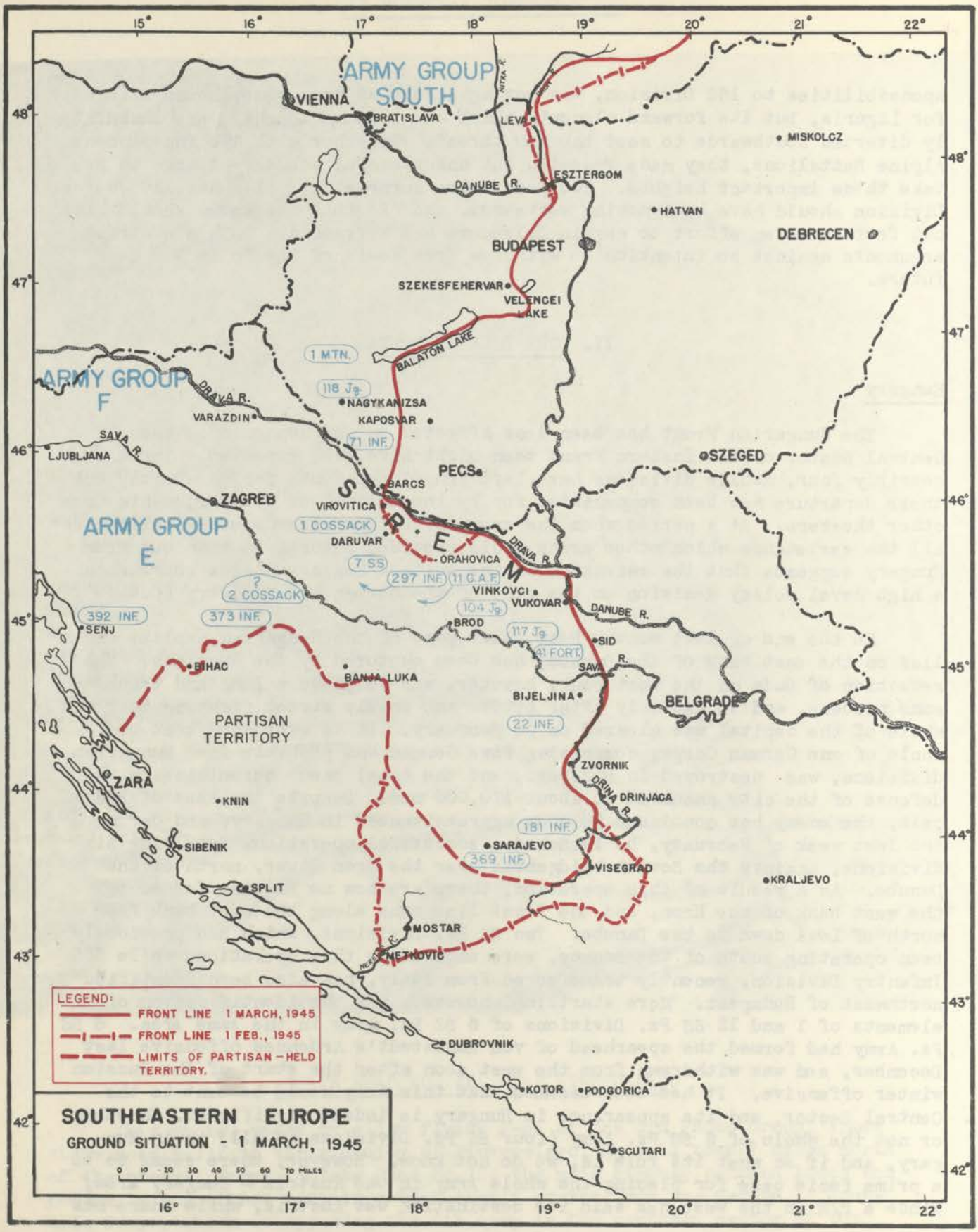
sponsibilities to 162 Division, was moving across at that time, bound allegedly for Liguria, but its forward elements, which had reached Modena, were immediately diverted southwards to meet the new threat. Together with two independent Alpine Battalions, they made repeated but unsuccessful counter-attacks to retake these important heights. Two points are surprising: (1) that 114 Jaeger Division should have been moving westwards, and (2) that the enemy should have put forth such an effort to regain Belvedere and Torraccia. Both are strong arguments against an intention to withdraw from south of the Po in the near future.

II. THE BALKAN FRONT

Hungary

The Hungarian Front has been less affected by developments on the Central Sector of the Eastern Front than might have been expected. Three, or possibly four, mobile divisions have left Army Group South for the North, but their departure has been compensated for by the arrival of reinforcements from other theaters. At a period when the enemy situation elsewhere was calling for all the assistance which other areas could provide, refusal to thin out from Hungary suggests that the retention of the Western Hungarian area represents a high level policy decision on the part of the German War Ministry (O.K.W.).

At the end of last month, Pest, that part of the Hungarian capital which lies on the east bank of the Danube, had been captured by the Russians. The reduction of Buda on the west bank, however, was to prove a long and troublesome process, and it was only after bitter and costly street fighting that the whole of the capital was cleared on 24 February. It is estimated that the whole of one German Corps, comprising five German and probably five Hungarian divisions, was destroyed in Budapest, and the total enemy casualties in the defense of the city amounted to about 170,000 men. Despite the loss of Budapest, the enemy has continued to show aggressiveness in Hungary, and during the last week of February, he launched a successful operation, involving six divisions, against the Soviet bridgehead over the Hron River, north of the Danube. As a result of this operation, there are now no Russian forces on the west bank of the Hron, and the front line runs along the east bank from north of Leva down to the Danube. Two SS Pz. Divisions, which had previously been operating south of the Danube, were engaged in this operation, while 356 Infantry Division, recently transferred from Italy, has also been identified northwest of Budapest. More startling, however, was the identification of elements of 1 and 12 SS Pz. Divisions of 6 SS Pz. Army in the same area. 6 SS Pz. Army had formed the spearhead of von Rundstedt's Ardennes offensive last December, and was withdrawn from the west soon after the start of the Russian winter offensive. It had been assumed that this Army would be sent to the Central Sector, and its appearance in Hungary is indeed significant. Whether or not the whole of 6 SS Pz. Army (four SS Pz. Divisions in all) is in Hungary, and if so what its role is, we do not know. However, there seems to be a prima facie case for placing the whole Army in the Austria - Hungary area, since a P/W in the west has said its destination was Austria, while there has


ARMY GROUP SOUTH
ARMY GROUP F
ARMY GROUP E
VIENNA
BRATISLAVA
LEVA
ESZTERGOM
MISKOLCZ
HATVAN
DEBRECEN
BUDAPEST
SZEKESFEHERVAR
VELENCEI LAKE
BALATON LAKE
DANUBE R.
DRAVA R.
SAVA R.
NITRA R.
HRON R.
1 MTN.
118 Jg.
NAGYKANIZSA
KAPOSVAR
VARAZDIN
71 INF.
LJUBLJANA
ZAGREB
PECS
SZEGED
BARCS
VIROVITICA
1 COSSACK
DARUVAR
7 SS
ORAHOVICA
297 INF.
11 G.A.F.
2 COSSACK
VINKOVCI
VUKOVAR
104 Jg.
392 INF.
373 INF.
SENJ
BROD
117 Jg.
SID
21 FORT.
BIHAC
BANJA LUKA
BIJELJINA
BELGRADE
22 INF.
PARTISAN TERRITORY
ZARA
KNIN
ZVORNIK
DRINA R.
DRINJACA
181 INF.
SIBENIK
SARAJEVO
369 INF.
VISEGRAD
KRALJEVO
SPLIT
MOSTAR
METKOVIC
NERETVA R.
DUBROVNIK
KOTOR
PODGORICA
SCUTARI
LEGEND:
FRONT LINE 1 MARCH, 1945
FRONT LINE 1 FEB., 1945
LIMITS OF PARTISAN-HELD TERRITORY.
SOUTHEASTERN EUROPE
GROUND SITUATION - 1 MARCH, 1945
0 10 20 30 40 50 60 70 MILES

been no satisfactory explanation for the heavy loading of the Gyor marshalling yards in mid-February, other than the arrival of 6 SS Pz. Army. Whether it has come as a replacement for armor withdrawn from Hungary to the Central Sector, or whether it is to have an offensive role in Hungary are matters for speculation. The identification of elements of this Army on the Hron River suggests that even this limited German operation was beyond the resources of the existing enemy forces in the area, and that 6 SS Pz. Army had to be called upon for assistance. At this stage of the war, the holding of Western Hungary may well take a high priority on the German strategic plan. Considerations affecting this are no doubt the oil fields of Southwestern Hungary, and the industrial regions of Eastern Austria, including the aircraft factories of Graz and Wiener Neustadt.

Yugoslavia

In last month's Bulletin, it was stated that the Soviet bridgehead over the Drava River at Barcs was then the only really unsatisfactory feature in the enemy's position in Yugoslavia. It is a measure of the changes in the situation during the past month that, although that bridgehead has been eliminated, the enemy's position is now considerably more difficult than it was a month ago.

The Barcs bridgehead was eliminated as the result of an attack which was launched from the east and south on the morning of 4 February. It soon became apparent that the attack was on a very much larger scale than either of the two previous attempts to eliminate the bridgehead. Elements of at least four German divisions took part, and within a week the bridgehead had been wiped out. As a threat to the Brod - Zagreb Railway, it had proved of considerable value in tying up German forces, but it was in fact never reinforced or exploited by the Russians on a scale sufficient to threaten the German position in Yugoslavia.

However, the German troubles in Northern Yugoslavia did not end with the Barcs bridgehead; or to be more accurate the forces available to the enemy were not large enough to carry out all his plans. Since the conclusion of the Barcs operation, it has been apparent that a considerable thinning out of German forces has taken place in that area. The Partisans have again retaken several towns, of which Daruvar, south of Virovitica, is the most important, and there has been considerable westward movement along the Virovitica — Varazdin road. It appears that at least two divisions are involved in this movement, and according to one report elements of 297 Infantry and 11 GAF Divisions have begun to cross the Drava into Hungary, south of Nagykanisza. There is no indication of their future employment, but it is conceivable that the enemy may be planning an operation to push back Soviet forces from their present uncomfortable proximity to the important Nagykanisza oil fields.

Meanwhile, in the south, the enemy drive towards the coast proved a flash in the pan, and it soon became apparent that an evacuation from Mostar and Visegrad, the two strongpoints covering Sarajevo, was envisaged. Mostar fell to the Partisans after a sharp and, for the enemy, costly battle. The enemy

forces in this area, belonging to 369 Legion Division, have now withdrawn to positions about half way between Mostar and Sarajevo. East of Sarajevo, however, Visegrad on the Drina River was evacuated voluntarily, although the suddenness of its abandonment was not without embarrassment to the enemy forces in the Drina Valley north of the town, particularly to 22 Infantry Division at Zvornik, which found itself cut off and reduced to eating fodder. 7 SS Mountain Division, which had only just arrived in the Srem in time to participate in the Barcs operation, was forced to send down a relief force, which succeeded in extricating 22 Infantry Division and assisting it back to the Bijeljina area.

The enemy position in Yugoslavia has thus changed considerably during the course of February. An early withdrawal from Sarajevo itself seems inevitable, and the headquarters of 21 Mountain Corps has already left for the north. How far the withdrawal will then go is not clear. If the Srem is to be abandoned, a halt short of the Balaton - Senj Line seems unlikely. But this will probably mean the abandonment of the Hungarian oil, and is unlikely to appeal to the enemy. In present circumstances he will certainly prefer to cling to the Srem, which in turn implies retention of the Zagreb - Brod - Vinkovci Railway. The line of the Sava south of this railway will bring the Partisans too close to it for comfort, so it is conceivable that the enemy may be planning to hold a line somewhere south of the river in sufficient depth to break up any Partisan attempt to cross it, and thereby threaten his main line of communication.

BRUGNATO ROAD BRIDGES

These bridges near Brugnato, approximately 10 miles north of La Spezia on State Road No.1, were attacked by P-47's of XXII T.A.C. on 4 February 1945. One span of the west bridge, under attack at the time this photo was taken, was destroyed. The east bridge remains passable, although badly damaged at the south end.

SAN FELICE RAIL FILL

Attacked on 23 February, 1945, by 17 B-25's of the 57th Bomb Wing, this target, a rail fill on the Brenner Pass Line just north of Lavis, was covered by an excellent concentration, all of the 55 x 1000 lb. G.P. bombs dropped falling in the target area. Photo reconnaissance subsequent to the attack reported the tracks cut by seven craters.

ACTIVITY AND DISPOSITION OF THE ENEMY AIR FORCE

SINGLE ENGINE FIGHTERS

Enemy fighters operated on 12 to 15 days during February, a slight increase in activity over January, but the effectiveness of interception remained poor, as was anticipated on the basis of previous experience. Few aggressive attacks were made, and actual engagements with our bombers and fighters occurred only 7 or 8 times. The largest formation of enemy aircraft sighted in recent months — an estimated 40 SEF, mostly ME-109's — was engaged by a small number of P-47's near Verona on 6 February. Thereafter, enemy formations sighted consisted of 10 to 15 aircraft, and the tendency was for only one pair to press their attacks; these possibly were the German leaders of the Italian formations. A few determined attempts to intercept photo aircraft were also made by pairs of enemy fighters.

There were some indications that German-piloted FW-190's attempted to attack M.A.S.A.F. night bombers on 27 February, but other evidence suggests that this unit is training primarily for night harassing attacks against our ground forces. (See below under "Bombers").

The enemy operational SEF force in Italy is still considered to consist of the First and Second Groups of the Fascist Republican Air Force, while the Third Italian Group is reported to have pilots under training in Germany.

BOMBERS

The small JU-87 force of NSG 9 failed to operate during February, in spite of favorable moon and weather conditions. In view of the very critical shortage of fuel in the Luftwaffe, it may well be that the night ground attack aircraft were conserving their fuel during the period of relative inactivity on the battle front, while priority was given to air defense of the zone of communications. This period may also have been utilized to convert one of the Staffeln of NSG 9 from JU-87's to FW-190's.

A unit, estimated at 10 FW-190's, was apparently training in the Villafranca di Verona area on night fighter-bomber operations, and may be expected to attempt occasional sorties over the front lines. There are indications that a blind bombing procedure may be employed, in a similar method to that used by FW-190's in a few operations during November and December 1944.

The Italian torpedo-bomber squadron still appears to exist as a non-operational unit, having never made an attack.

RECONNAISSANCE

Some tendency to concentrate the strategic reconnaissance effort of F 122 into a few fairly strong night operations was noted during the month, although on the whole the activity continued to be on a slight scale. Only a few day flights were made by the ME-410's of 2/F 122, the average being considerably less than one per day. Our fighters further minimized the day reconnaissance by destroying several of these aircraft.

Flares were dropped over Leghorn and Borgo (Corsica), Naples, and Ancona, by night reconnaissance aircraft during the month. One special operation was carried out on the night of 16/17 February by six aircraft, some of which staged at Aviano and Udine, probably for flights down the southeast coast of Italy.

An average of one or two daily missions over the battle front and on the eastern coast were flown by the ME-109's and FW-190's of I/NAG 11, based mainly at Udine.

No further developments in the preparations to employ jet or rocket-propelled aircraft in Italy have been confirmed. However, photo reconnaissance revealed what possibly may have been a jet-propelled aircraft at Udine last month, and a ground report has mentioned Osoppo as the site of preparations to receive special aircraft from Germany. It is considered unlikely that even a small detachment of jet-propelled reconnaissance aircraft will become operational during March.

ESTIMATED DISPOSITION OF ENEMY AIRCRAFT IN ITALY

TYPE	NUMBER	EMPLOYMENT	BASES
ME-109	60	Fighter Defense	Aviano, Udine, Lonate.
ME-109/FW-190	30	Tactical Reconnaissance	Udine.
JU-88/188 ME-410	20	Strategical Reconnaissance	Bergamo.
JU-87	25	Night Harassing	Villafranca di Verona, Ghedi.
FW-190	10	Night Harassing (Training)	Villafranca di Verona.
SM-79	10	Torpedo Bombers (Have not operated).	Ghedi.

AIR DEFENSE IN THE MUNICH - VIENNA AREA

The strain imposed on the Luftwaffe on the Eastern and Western Fronts, in addition to the over-all fuel shortage, has been reflected in a considerable reduction in the fighter defenses in Southern Germany and Austria. Recently heavy bombers operating in the Vienna Area have sighted very few single twin engine fighters, and for several months no important day defense has been offered in the Munich Area.

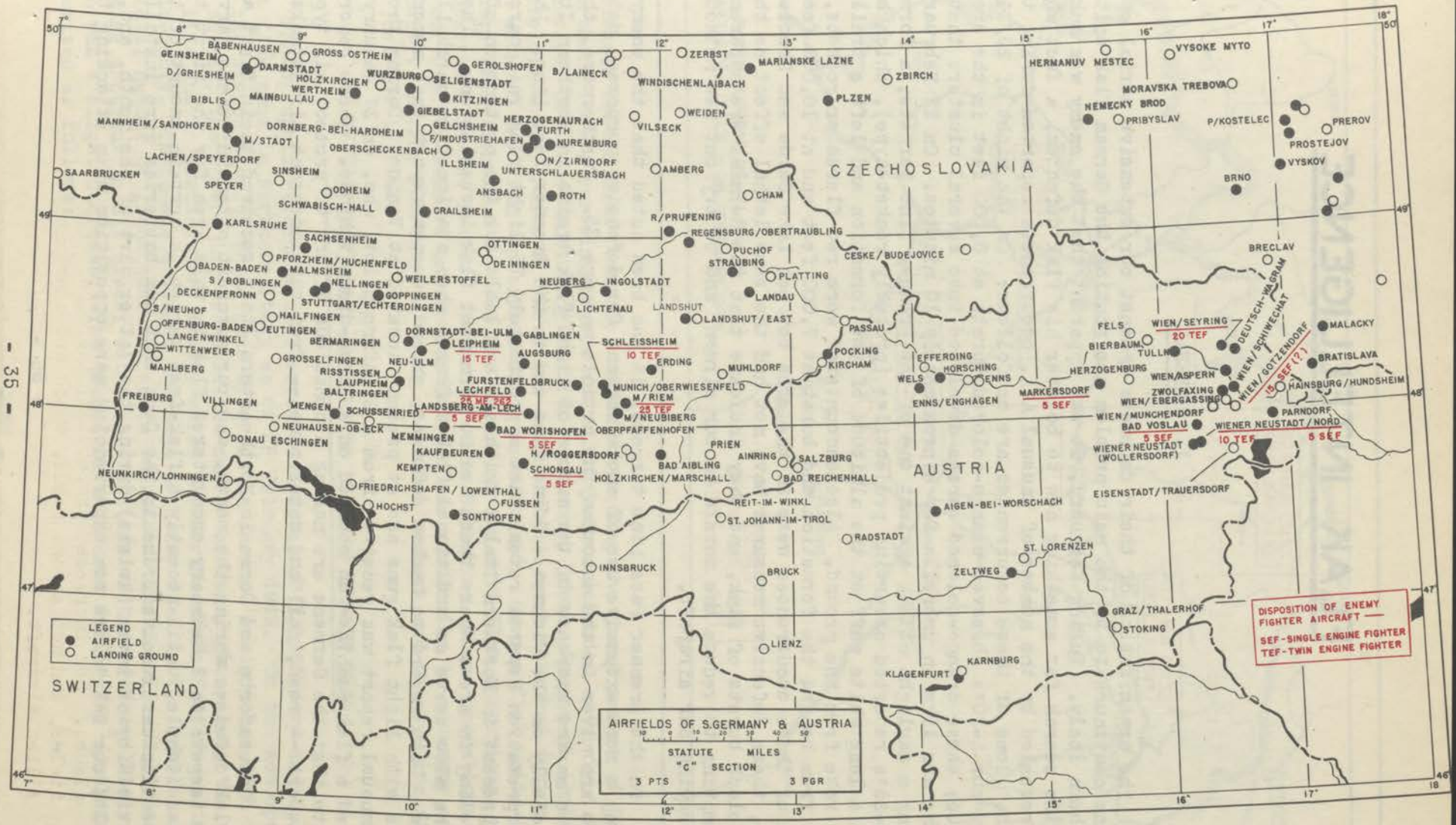
In the Vienna Area the G.A.F. previously employed one group of SEF in a defensive role, but their activity has been so slight recently as to suggest that they may no longer be on a fully operational basis. The only other defensive unit in Eastern Austria is one group of 30 twin engine night fighters (ME-110/JU-88), based at Vienna/Seyring and Wiener Neustadt. A few of these once opposed our four engine bombers, but day operations are not considered to be their primary mission. Slight reaction might occasionally be offered by about five SEF from each of the flying schools at Wiener Neustadt, Bad Voslau, and Markersdorf. For tactical operations against the Russians, the Germans are believed to have available three Groups, totalling about 120 SEF, based in the area Szombathley - Veszprem - Gyor. It is considered that these latter units are unlikely to react to Allied bomber attacks from bases in Italy.

In the Munich Area, day fighter defense is probably entrusted to a handful of instructors and senior students at the ME-262 training and assembly airfields. The most important number of these aircraft is at Lechfeld, northwest of Munich, where it is estimated that 25 ME-262's are available for operations. The encounters so far have consisted mostly of ME-262's making practice passes at Allied photo reconnaissance aircraft. In addition, there are about 50 TEF for night defense, based at Munich/Riem, Leipheim, and Schleissheim. The schools in this vicinity again offer a slight possibility of opposition, with an estimated five SEF operational each at Woerishofen, Schoengau, and Landsberg. No first-line fighter units are known to be based in Yugoslavia at present.

ENEMY METHODS

Aircraft Warning: Recent Italian P/W's report that the Germans have established posts along supply routes in Northern Italy, to warn convoys and troops of approaching Allied planes. These posts are usually located on high points along the roads. A red flare is the signal given for the alert; a blue flare signifies "All-Clear". During the alert, all vehicles and troops move off the road. These red and blue flares are used both during the day and at night. There are some such warning posts along the roads between Bologna and Vignola (L-6247).

Protection of Telephone Cables from Air Attack: The Germans are burying their telephone cables to prevent them from being destroyed by air attacks. The cables are buried as deep as one meter in some places. For increased protection, these cables are often laid across fields, and not across roads, which are constantly being attacked by Allied aircraft.


BABENHAUSEN
GROSS OSTHEIM
GEINSHEIM
DARMSTADT
D/GRIESHEIM
HOLZKIRCHEN
WERTHEIM
WURZBURG
GEROLSHOFEN
SELIGENSTADT
B/LAINECK
ZERBST
MARIANSKE LAZNE
WINDISCHENLAIBACH
ZBIRCH
HERMANUV MESTEC
VYSOKE MYTO
MORAVSKA TREBOVA
NEMECKY BROD
PRIBYSLAV
P/KOSTELEC
PREROV
PROSTEJOV
VYSKOV
BRNO
BIBLIS
MAINBULLAU
KITZINGEN
GIEBELSTADT
PLZEN
WEIDEN
VILSECK
MANNHEIM/SANDHOFEN
DORNBERG-BEI-HARDHEIM
GELCHSHEIM
F/INDUSTRIEHAFEN
HERZOGENAURACH
FURTH
NUREMBURG
M/STADT
OBERSCHECKENBACH
ILLSHEIM
N/ZIRNDORF
UNTERSCHLAUERSBACH
LACHEN/SPEYERDORF
SAARBRUCKEN
SINSHEIM
SPEYER
ODHEIM
SCHWABISCH-HALL
CRAILSHEIM
ANSBACH
ROTH
AMBERG
CHAM
CZECHOSLOVAKIA
KARLSRUHE
R/PRUFENING
REGENSBURG/OBERTRAUBLING
SACHSENHEIM
OTTINGEN
DEININGEN
PUCHOF
STRAUBING
PLATTING
CESKE/BUDEJOVICE
BRECLAV
PFORZHEIM/HUCHENFELD
BADEN-BADEN
MALMSHEIM
S/BOBLINGEN
NELLINGEN
WEILERSTOFFEL
NEUBERG
INGOLSTADT
LICHTENAU
LANDSHUT
LANDAU
LANDSHUT/EAST
DECKENPFRONN
STUTTGART/ECHTERDINGEN
GOPPINGEN
S/NEUHOF
HAILFINGEN
EUTINGEN
OFFENBURG-BADEN
LANGENWINKEL
WITTENWEIER
MAHLBERG
BERMARINGEN
DORNSTADT-BEI-ULM
LEIPHEIM
15 TEF
GABLINGEN
AUGSBURG
SCHLEISSHEIM
10 TEF
ERDING
MUHLDORF
PASSAU
POCKING
KIRCHAM
FELS
WIEN/SEYRING
20 TEF
BIERBAUM
TULLN
DEUTSCH-WAGRAM
WIEN/SCHWECHAT
MALACKY
BRATISLAVA
EFFERDING
HORSCHING
WELS
ENNS
ENNS/ENGHAGEN
MARKERSDORF
5 SEF
HERZOGENBURG
WIEN/ASPERN
ZWOLFAXING
WIEN/EBERGASSING
WIEN/GOTZENDORF
15 SEF (?)
HAINSBURG/HUNDSHEIM
GROSSELFINGEN
NEU-ULM
RISSTISSEN
LAUPHEIM
BALTRINGEN
FURSTENFELDBRUCK
LECHFELD
24 ME 262
LANDSBERG-AM-LECH
5 SEF
MUNICH/OBERWIESENFELD
M/RIEM
25 TEF
M/NEUBIBERG
OBERPFAFFENHOFEN
FREIBURG
VILLINGEN
MENGEN
SCHUSSENRIED
NEUHAUSEN-OB-ECK
DONAU ESCHINGEN
MEMMINGEN
BAD WORISHOFEN
5 SEF
WIEN/MUNCHENDORF
BAD VOSLAU
5 SEF
WIENER NEUSTADT/NORD
10 TEF
5 SEF
WIENER NEUSTADT (WOLLERSDORF)
PARNDORF
KAUFBEUREN
M/ROGGERSDORF
PRIEN
AINRING
SALZBURG
BAD AIBLING
BAD REICHENHALL
HOLZKIRCHEN/MARSCHALL
KEMPTEN
SCHONGAU
5 SEF
AUSTRIA
NEUNKIRCH/LOHNINGEN
FRIEDRICHSHAFEN/LOWENTHAL
HOCHST
FUSSEN
SONTHOFEN
REIT-IM-WINKL
ST. JOHANN-IM-TIROL
EISENSTADT/TRAUERSDORF
AIGEN-BEI-WORSCHACH
RADSTADT
ST. LORENZEN
ZELTWEG
INNSBRUCK
BRUCK
GRAZ/THALERHOF
STOKING
LIENZ
KLAGENFURT
KARNBURG
SWITZERLAND
LEGEND
AIRFIELD
LANDING GROUND
AIRFIELDS OF S.GERMANY & AUSTRIA
STATUTE MILES
"C" SECTION
3 PTS
3 PGR
DISPOSITION OF ENEMY FIGHTER AIRCRAFT
SEF-SINGLE ENGINE FIGHTER
TEF-TWIN ENGINE FIGHTER

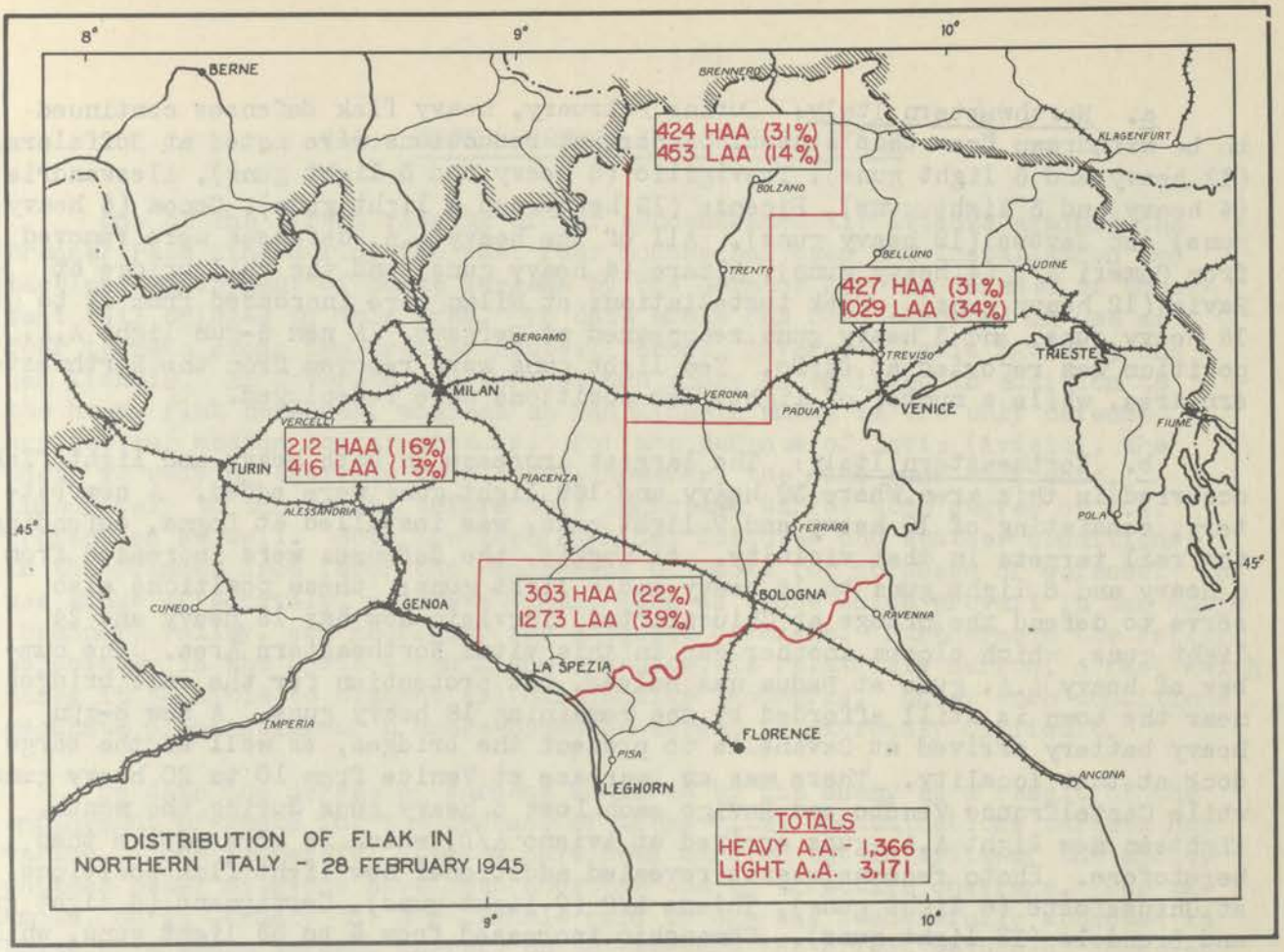
FLAK INTELLIGENCE

I. GENERAL

The organization of their defenses against our extensive aerial operations continues to be the main problem confronting the German flak units in Northern Italy. During February, it was apparent that the enemy was making a frantic search for something new to bolster his flak defenses, a fact which was revealed by the number of unusual A.A. occurrences reported during the month. Some of these occurrences are as follows: On the night of 23/24 February our A-20's observed orange-colored bursts at 8,000 feet in the area of F-6206; these orange-colored bursts developed into several clusters that hung in the air like an umbrella for approximately 10 minutes. On 22 February, during a daylight attack against one of the Brenner Line targets, a formation of B-25's reported observing projectiles (probably rocket-type), which burst with a long white puff at the altitude of the formation and left a trail as they rose from the ground. Also encountered were red flares or rockets, which came from behind the formation and burst at 7,000 feet and at 10,000 feet. Both of these occurrences were in the area between Lake Garda and Ghedi. To date, these defensive measures have not had the same lethal effect as the normal black bursts of flak, and they indicate that the Germans are apparently attempting to reduce the morale of our airmen, and to try out new methods of destroying our aircraft.

On the Brenner Pass Line targets, it has been noted that the enemy has been making a more extensive use of smoke screens for defensive purposes, details of which are given in the accompanying article on page 39. Furthermore, there has been a marked increase in the number of light flak trains in Northern Italy, especially on the Vicenza - Udine Line and on the Brenner Pass Line. Photo Interpretation Reports reveal that approximately 75 light flak rail cars are now present in Northern Italy, which are available for the protection of trains traveling in areas where there are no permanent flak installations. These trains also serve as additional flak defenses when stationed in marshalling yards. With regard to harbor defenses, ground sources report that numerous boats with light flak guns are at present located at Venice. During the month, an unusual report was received from a Spitfire pilot, who, on 27 January, observed a flak machine-gun mounted on a horse-drawn vehicle. These reports indicate that the Germans are making a conscious effort to protect all types of transport — road, rail and waterborne — from our incessant air attacks.

Chiusaforte and Dogna in Northeastern Italy received their first allotment of flak defenses during the month, and our aircraft attacking these Tarvisio Line targets on 2 February encountered flak in this area for the first time. At San Michele, until recently a flak-free target, a certain amount of A.A. protection was received, due to the fact that new batteries were installed in the vicinity of Lavis (Avisio) during the latter part of the month, and, as a result, our B-25's are now experiencing more opposition when attacking the



San Michele bridge than formerly. Notwithstanding the great amount of flak in Northern Italy, certain targets are still left undefended by heavy A.A. guns, and several of these, including Sacile, Pordenone, Crema, Romano di Lombardia, Palozzolo, Mantua, Ponte di Piave and Sesto Calende were attacked during the month without any flak opposition being encountered. German flak units in Northern Italy continue to feel the impact of our anti-flak operations, which are described in the Tactics Section of this Bulletin; these operations by both our fighter-bombers and medium bombers are continuing in accuracy and intensity. During February, a total of eleven bombers and thirty-five fighters were lost due to flak.

II. DISPOSITIONS AND TRENDS DURING FEBRUARY 1945

Photographic reconnaissance revealed a total of 1,366 heavy and 3,171 light flak guns in Northern Italy as of 28 February 1945. On the accompanying map, the disposition of these guns by areas is shown. As compared with the January totals, there were increases in the number of heavy guns along the Brenner Pass Line and in Northeastern Italy, while the Northwestern Sector declined considerably. There was a slight decrease of heavy flak in the battle area. The total number of light guns was again increased this month, a definite build-up being apparent in all areas, with the exception of Northwestern Italy, where there was a slight decrease. The trends in each area during the month may be summarized as follows:

a. Northwestern Italy: During February, heavy flak defenses continued to be withdrawn from this sector. Important reductions were noted at Boffalora, (12 heavy and 6 light guns), Trevigilio (6 heavy and 3 light guns), Alessandria (4 heavy and 3 light guns), Picenza (12 heavy and 4 light guns), Genoa (6 heavy guns) and Savona (19 heavy guns). All of the heavy A.A. defenses were removed from Cameri A/D (4 heavy guns), Altare (4 heavy guns) and the rail bridge at Pavia (12 heavy guns). Flak installations at Milan were increased from 12 to 18 heavy guns, and 3 heavy guns reappeared at Bergamo. A new 6-gun light A.A. position was reported at Darfo. Ten light guns were removed from the Northwestern Area, while a number of light flak positions were redeployed.

b. Northeastern Italy: The largest increase in both heavy and light flak occurred in this area, where 39 heavy and 169 light guns were added. A new battery, consisting of 10 heavy and 9 light guns, was installed at Dogna, defending the rail targets in that vicinity. At Moggio, the defenses were increased from 6 heavy and 6 light guns to 16 heavy and 9 light guns; these positions also serve to defend the bridge at Chiusaforte. Tarvisio now has 18 heavy and 24 light guns, which closes another gap in this vital Northeastern Area. The number of heavy A.A. guns at Padua was halved, but protection for the rail bridges near the town is still afforded by the remaining 18 heavy guns. A new 8-gun heavy battery arrived at Cavanella to protect the bridges, as well as the barge dock at that locality. There was an increase at Venice from 10 to 20 heavy guns, while Castelfranco Veneto and Rovigo each lost 6 heavy guns during the month. Eighteen new light A.A. guns arrived at Aviano A/D, which is more active than heretofore. Photo reconnaissance revealed additional new light flak positions at Chiusaforte (6 light guns), Thiene L/G (9 light guns), Cervignano (6 light guns) and Brondola (13 light guns). Comacchio increased from 6 to 33 light guns, while light batteries were withdrawn from Bordona (12 light guns) and San Dona di Piave (6 light guns).

c. Brenner Pass Line: As in Northeastern Italy, the defenses along the Brenner Pass Line were again increased as regards both heavy and light flak. With respect to heavy guns, Trento increased from 32 to 42, Laion from 6 to 16, and Bressanone from 34 to 44. New batteries were reported at Castelrotto (12 heavy guns), Lavis (20 heavy guns) and Brennero (4 heavy guns). It appears that batteries from the Southern Sector of the Line are now being shifted farther north, a fact which is indicated by the removal of 24 heavy guns from Peschiera and 6 from Belluno Veronese, as well as the reduction at Brantimo Belluno from 18 heavy to 12 heavy guns. Other decreases occurred at Bolzano (6 heavy guns) and Ora (10 heavy guns). The predominating increase in light flak defenses took place in the Rovereto area, which now has 68 light A.A. guns, as compared with 42 a month ago. Other points which received increases in light flak were Bressanone (12 light guns), Lavis (12 light guns), Verona (12 light guns), Laion (3 light guns), and Castelrotto (6 light guns).

d. Battle Area: In comparison with the past two months, changes in this area were moderate during February. There was a slight decrease in the total of heavy guns, mainly affecting the Bologna area. An increase of approximately 75 light guns occurred in the Battle Area, mainly at Bologna and northwest of Faenza. In the Western Sector of the Battle Area there were no changes of importance.

III. SMOKE SCREENS IN NORTHERN ITALY

One of the direct results of our concentrated air attacks against the Brenner Pass Line during the past four months has been the installation and tactical employment of smoke screens by the Germans for the defense of important rail bridges in this area. To date smoke has been reported in use at four targets along the Brenner Route: Verona, Rovereto, Lavis (Avisio) and San Michele. At Rovereto and Verona, the smoke is employed in addition to the heavy flak defenses, whereas at San Michele smoke is the only defense against our medium bomber attacks. For the defense of Lavis (Avisio), the enemy is relying entirely upon smoke; however, the flak guns at Trento, immediately to the south, afford this important target some degree of A.A. protection as well. Both the topographical features and weather conditions in the Brenner Area favor the employment of smoke for purposes of defense. To use smoke effectively, moderate winds, such as those which prevail in the Adige (Brenner) Valley, are necessary for adequate coverage. Furthermore the Valley, especially in the Lavis - San Michele sector, is relatively narrow, a fact which makes it possible to blanket all distinctive landmarks. Under such conditions accurate pinpointing of a smoke-obscured target is extremely difficult.

To date the degree of success achieved by the enemy as a result of the employment of smoke for the defense of these vital communications targets has varied. Some successful attacks have been carried out in spite of the smoke, whereas other missions have been abortive due to effective coverage. For example, on 18 January the San Michele rail bridge was successfully attacked in spite of a smoke screen, whereas on 20 February the effective use of smoke at Lavis (Avisio) prevented our medium bombers from attacking this target.

It is believed that the Germans are using generators consisting of a metal drum of chlorsulphonic acid, which has a capacity of 150 liters (40 gallons), and which is connected to a compressed air cylinder. In the accompanying photographs one of these drums with and one without the compressed air

The smoke generator and compressed air cylinder. The latter contains a gas which forces the smoke chemical in the drum through the spray nozzle.

cylinder are shown. The acid is expelled through a nozzle at a rate which can be varied as required from 1/2 liter to 2 liters per minute. Each generator is turned on manually, and one or more spare drums of acid are normally kept on

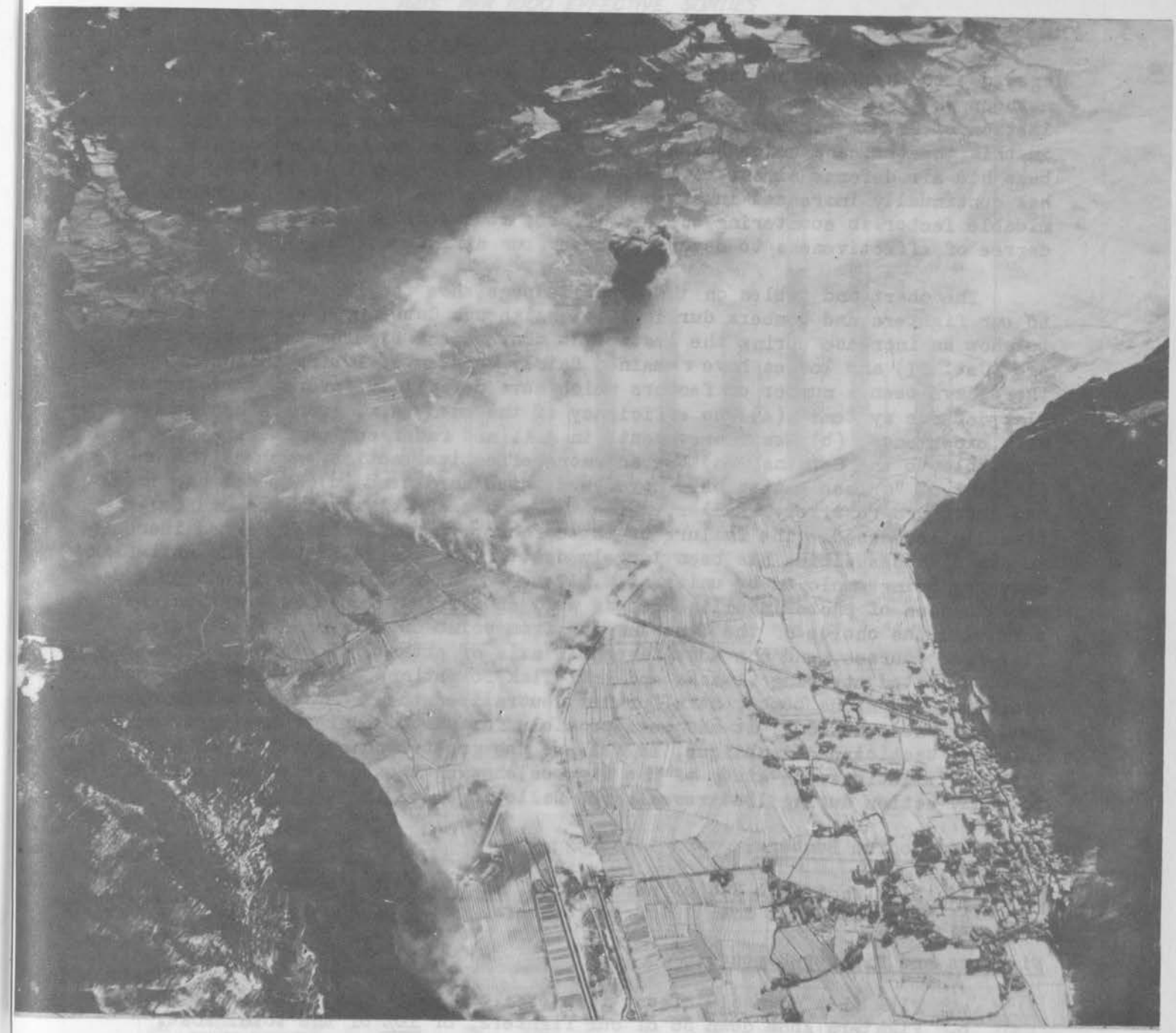
The smoke generator, which has a capacity of 150 liters (40 gallons) of chlorsulphonic acid, showing method of manual control.

hand for quick replacement. Effective densities can be accomplished in about 20 minutes, and an attempt is made to commence operation 30 to 40 minutes prior to attack. With his complete radar coverage of Northern Italy, the enemy's smoke screen operators should have ample time to set the generators into operation at least 1/2 hour prior to the arrival of our medium bomber formations in the target area.

Factors which are believed to aid the Germans in the employment of smoke to defend targets along the Brenner Pass Line are: (a) the small size of the majority of the targets, (b) the prevailing winds, and (c) the accessibility of the installations to road and rail transport. On the other hand, the enemy is undoubtedly encountering certain difficulties in the tactical employment of smoke, one of which is the obvious problem of pre-determining the targets which we intend to attack. Furthermore, in connection with our numerous operations in this area, he must surely be faced with the problem of supply, as well as the general manpower shortage which is known to exist.

It is interesting to note that under normal conditions smoke screens are so placed that the heavy flak positions are not covered. This would definitely reduce the accuracy of fire, since smoke coverage would cause the gunners to employ solely unseen fire-control methods, which are considered to be only about 25% as accurate as visually controlled fire.

SMOKE SCREEN IN NORTHERN ITALY



SAN MICHELE RAIL BRIDGE

In spite of this moderately effective smoke screen at San Michele on the Brenner Pass Line, 24 B-25's of the 57th Bomb Wing successfully attacked the rail bridge at A-797389 on 18 January 1945. Direct hits destroyed the northern half of the bridge and cut the north approach. At the time of this attack, the enemy was relying entirely on smoke for the defense of this vital communications target, there being no flak guns present.

IV. FLAK STATISTICS FOR 1944

A study of the statistics covering aircraft of M.A.T.A.F. lost and damaged due to enemy action during 1944 clearly reveals the change in air defense methods which have been forced upon the enemy in Northern Italy. The neutralization of German air power to the greatest practical degree has been accomplished in this theater, and under these circumstances the enemy has had to fall back and base his air defense almost entirely upon flak. Although this flak defense, which has continually increased in strength and improved in technique, has been a formidable factor in countering our air effort, it has never achieved a sufficient degree of effectiveness to severely hamper our air operations.

The chart and tables on the opposite page show the losses of and damage to our fighters and bombers during 1944. Although Category I damage has tended to show an increase during the last eight months, the figures for severe damage (Cat. II) and losses have remained fairly constant. During this same period, there have been a number of factors which have definitely favored the enemy's flak defense system: (a) The efficiency of the enemy A.A. gunners has improved with experience, (b) New improvements in A.A. and radar equipment have become available to the Germans, (c) New and more effective tactics, such as the employment of "Grosse Batterien", have been introduced, and (d) The defense area has grown progressively smaller, while the amount of A.A. available has continually increased. The failure of these factors to result in a marked increase in our flak casualties has been largely due to the evasive tactics and anti-flak measures being employed by units of M.A.T.A.F. In addition, the expansion and coordination of photo intelligence, as well as air and ground information, has permitted the choice of the best targets from point of view of A.A. defenses, flak-free courses, and the most favorable axis of attack. The use of fighters in coordinated strafing attacks and anti-flak formations, dispensing chaff and dropping phosphorus bombs, have further neutralized the enemy's defensive system. By these methods, it has been possible for us to counter the improvements in enemy tactics and technique, as well as the greater concentration of his flak installations. A study of the figures showing the losses of our aircraft to enemy action during 1944 reveals the following:

Light and Medium Bombers:

a. Flak shot down 203 of our bombers, or 91% of the total lost.
b. Fighters shot down 19 of our bombers, or 9% of the total lost.

Fighters and Fighter-Bombers:

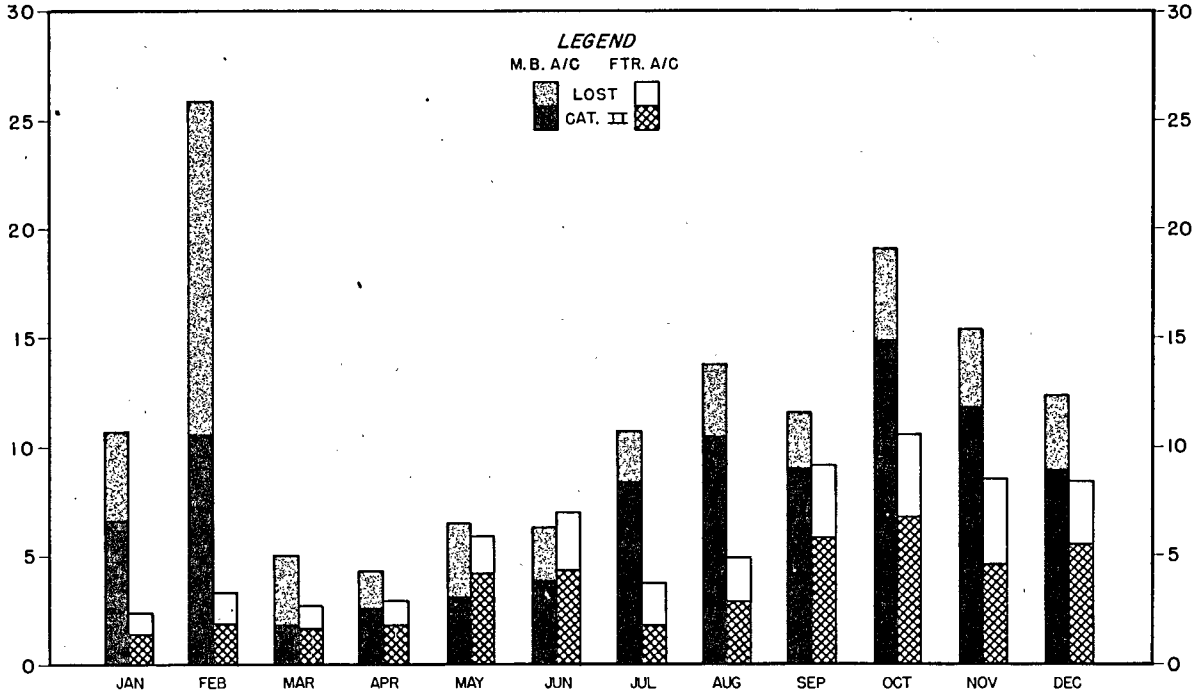
a. Flak shot down 510 of our fighters, or 90% of the total lost.
b. Fighters shot down 56 of our fighters, or 10% of the total lost.

Flak is definitely the source of our greatest opposition from point of view of air operations, and in all probability it will continue to be during the coming months. For this reason new tactics and means to neutralize the enemy's flak defenses should be continually studied, since the Germans are known to be developing new A.A. defensive tactics, which we must be prepared to counter.

MEDITERRANEAN ALLIED TACTICAL AIR FORCE

AIRCRAFT LOST AND DAMAGED DUE TO FLAK IN 1944

RATE PER 1000 EFFECTIVE SORTIES



MONTH			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
FIGHTERS AND FIGHTER BOMBERS		EFFECTIVE SORTIES	23032	17295	21280	20589	33136	24484	22357	26430	16977	11466	13357	15385
		LOST	24	24	22	24	58	67	43	52	57	44	51	44
		DAMAGED CAT. II	32	33	36	36	138	104	40	77	99	78	62	85
	TOTAL	NUMBER	56	57	58	60	196	171	83	129	156	122	113	129
	TOTAL	RATE PER 1000 SORTIES	2.4	3.3	2.7	2.9	5.9	7.0	3.7	4.9	9.2	10.6	8.5	8.4

MONTH			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
LIGHT AND MEDIUM BOMBERS		EFFECTIVE SORTIES	4867	2173	4417	4612	7807	6396	6538	7844	6666	2617	3976	3474
		LOST	20	23	14	8	27	16	15	26	17	11	14	12
		DAMAGED CAT. II	32	23	8	12	24	24	55	82	60	39	47	31
	TOTAL	NUMBER	52	56	22	20	51	40	70	108	77	50	61	43
	TOTAL	RATE PER 1000 SORTIES	10.7	25.8	5.0	4.3	6.5	6.3	10.7	13.8	11.6	19.1	15.3	12.4

FIGURES ON CAT. I DAMAGE FOR R.A.F. UNITS OPERATING UNDER M.A.T.A.F ARE NOT AVAILABLE. *CAT. I DAMAGE FOR U.S.A.A.F. (12th A.F.) UNITS* OPERATING UNDER M.A.T.A.F. ARE AS FOLLOWS:

MONTH		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
CAT. I DAM.	FIGHTERS & FIGHTER BOMBERS	57	56	36	64	147	123	86	109	136	103	193	213
	LIGHT & MEDIUM BOMBERS	400	216	104	124	321	193	222	260	233	174	218	98

THE FOLLOWING TABLE, AS AN INDEX OF THE RELATIVE EFFECTIVENESS OF FLAK AND ENEMY AIRCRAFT, PRESENTS THE TOTAL LOSSES SUSTAINED BY UNITS OF M.A.T.A.F. DUE TO ENEMY ACTION DURING 1944:

TYPE A/C	CAUSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
FIGHTERS & FTR. BOMBERS	FLAK	24	24	22	24	58	67	43	52	57	44	51	44	510
	E/A	8	11	11	7	8	3	3	2	1	1	—	1	56
LIGHT & MED. BOMBERS	FLAK	20	23	14	8	27	16	15	26	17	11	14	12	203
	E/A	9	2	—	—	—	—	1	—	—	3	3	1	19

ENEMY LINES OF COMMUNICATION

- FEBRUARY 1945 -

FOREWORD

On the folding map, which has been inserted inside the back cover of this Bulletin, the main railway targets and lines or zones of interdiction in Northern Italy are shown. The targets are numbered, and the same number appears opposite the target in question on the status charts. On the map, the total medium bomber effort against railway targets in Northern Italy during February is shown; the charts indicate the daily status of each target throughout the month, as revealed by photo reconnaissance. This is an attempt to indicate the actual results achieved in relation to the effort expended against enemy lines of communication during February.

For the first time since M.A.T.A.F. commenced attacking the enemy's rail lines leading into Italy, the Brenner Pass Route was blocked throughout the month. In the Northeastern Frontier Zone, however, the situation was not so satisfactory, since for four days during February the Germans were enabled to route through traffic from the Verona area at least as far east as Chiusaforte on the Tarvisio Line. Along the Po River, the situation was relatively unchanged, except that Piacenza was damaged and made impassable on 8 February. Ferry and night pontoon bridge activity across the Po remained normal.

While on the basis of the present scale of fighting, the degree of rail interdiction achieved during the past month has probably not resulted in any acute shortage of supplies, no build-up is likely to have been possible. The only direct information on enemy supply has been numerous ground reports of coal shortages for both railways and industries. These reports have been received from a considerable number of sources, and it is thought that the information is correct. Troop trains have been considerably delayed, and much movement has been made by M/T with a consequent increase in motor fuel consumption, which the enemy can ill afford. The movement of 16 SS P.G. Division out of Italy, which commenced at the beginning of the month, took approximately three weeks, and at least part of the division had to move by M/T. According to ground reports, some troops of 16 SS P.G. Division were seen moving on foot through the rear areas, while in the Adige Valley, northward moving M/T was held up when they exhausted their fuel. One unit was allegedly reduced to buying petrol on the Black Market, and the difficulty which the enemy obviously experienced in completing what was an abnormally

important move is proof that M.A.T.A.F., even in bad weather conditions, can make the routes out of Italy a dangerous bottle-neck for the Germans. This fact must have the greatest influence on Kesselring's strategy.

Possibly the most important development during the month is the fact that our medium bombers have for the first time extended their zone of rail interdiction northward on the Brenner Railway to a point only about 25 miles south of the Brenner Pass. This deepens what has heretofore been the normal zone of effective interdiction on the Brenner by about 40 rail miles and will appreciably increase enemy transportation problems on this route. Another important feature of these attacks was the additional strain which they imposed on German repair facilities, which in Northern Italy are beginning to show signs of decreased effectiveness.

Brenner Pass Line

It was during the first week of February that the greatest amount of damage to, and consequent interdiction of, the Brenner Pass Line that has been achieved in some time, was effected. At the beginning of February, there was no evidence that the enemy's rate of repair effort had diminished; on the contrary the opposite had been noticeable. By the end of the month, however, the position was completely reversed, and there were many indications that the Germans were unable to compete with the increased rate at which damage was being inflicted. In this connection, ground sources report that between Verona and Innsbruck the Brenner Pass Line has been divided into five sections, as follows:

a. Verona - San Michele
b. San Michele - Ora
c. Ora - Chiusa
d. Chiusa - Brennero
e. Brennero - Innsbruck.

On each section at least one locomotive is permanently stationed, so that if the line is cut in two places, a locomotive will be on that section and ready to work any repair and/or reconstruction trains. These arrangements suggest that in the past, when the line has been cut at more than one place during the same series of attacks, repair work has been hampered, owing to the fact that there was no locomotive available to work repair trains on an isolated section. The Germans, having been apparently caught during the past, are making a desperate effort not to let the same difficulty re-occur. However, as a result of the increased tempo of our attacks during February, there were indications that the over-all facilities were being so heavily taxed that the repair crews could not effect repairs on the same schedule which has been noted in the past.

By 7 February, four substantial blocks had been created, the principal ones being at Lavis (Avisio), where the viaduct and diversion bridge were both impassable; Rovereto, which was heavily damaged; and Calliano, where

the approaches were cratered. Calliano was quickly repaired, and Rovereto was passable by 11 February. The diversion bridge at Lavis was not repaired until 17 February, but was again impassable on the 18th. Owing to a series of attacks, this bridge was open for only two days during the latter part of the month, namely 25 and 26 February. The damage to the viaduct was of such a nature that all repair efforts were finally abandoned, and it remained impassable until the end of the month.

On 12 February, the day following the completion of repairs at Rovereto, the bridge at Ala was completely destroyed and remained so until 18 February. While the distance between Lavis and Rovereto does not exceed 20 miles, these two blocks were of considerable value, since they meant that through traffic was completely halted and kept at a standstill for four days. The opening of Rovereto, however, enabled a certain amount of shuttling of both north and southbound traffic to take place, but the Ala attack again closed the line to through traffic. This time the period involved was six days and the distance was increased from 20 to 30 miles.

While temporary blocks, all of a relatively minor nature from point of actual damage, but nevertheless lasting anywhere from 12 hours to 5 days, were continually being created, there was no long-term block, involving heavy structural damage, during the latter part of the month, either in the Lavis Area or immediately south of it, until 27 and 28 February, when the main bridge at San Michele and the diversion bridge were both virtually destroyed. Five of six spans were destroyed at the former target, and the latter was completely obliterated.

On 28 February, a full-scale effort against the Brenner Pass Line was put out by the Fifteenth Air Force, the results of which materially assisted in further complicating the enemy's already chaotic situation. The important bridge at Parona, $5\frac{1}{4}$ miles northwest of Verona, had two spans destroyed, apart from any structural damage, as the result of an attack by the heavy bombers. This meant that the only available route for reaching the Brenner Pass Line from the south was to employ the old standard gauge, single track, by-pass line out of Verona. The southern terminal of this line is in the northwestern sector of the city, and there is no known connection with the two main marshalling yards, both of which are located in the southern part of Verona. This line rejoins the Brenner Route at the San Ambrogio station, a point which would very quickly become a serious bottle-neck if any large quantity of traffic was involved, since the marshalling facilities at San Ambrogio are extremely limited. Two days previously, on 26 February, the tracks in the Porta Nuova Yard (West Yard) had been cut by the Fifteenth Air Force, halting all through traffic. Part of this damage was immediately repaired, so as to allow at least one through line to operate, but the attack on 28 February cut all through traffic from the south and west.

With the line in relatively good condition below Bolzano, from point of view of interdiction, an attempt was made to impose an increased strain on it by effecting blocks at points further to the north. This policy proved highly

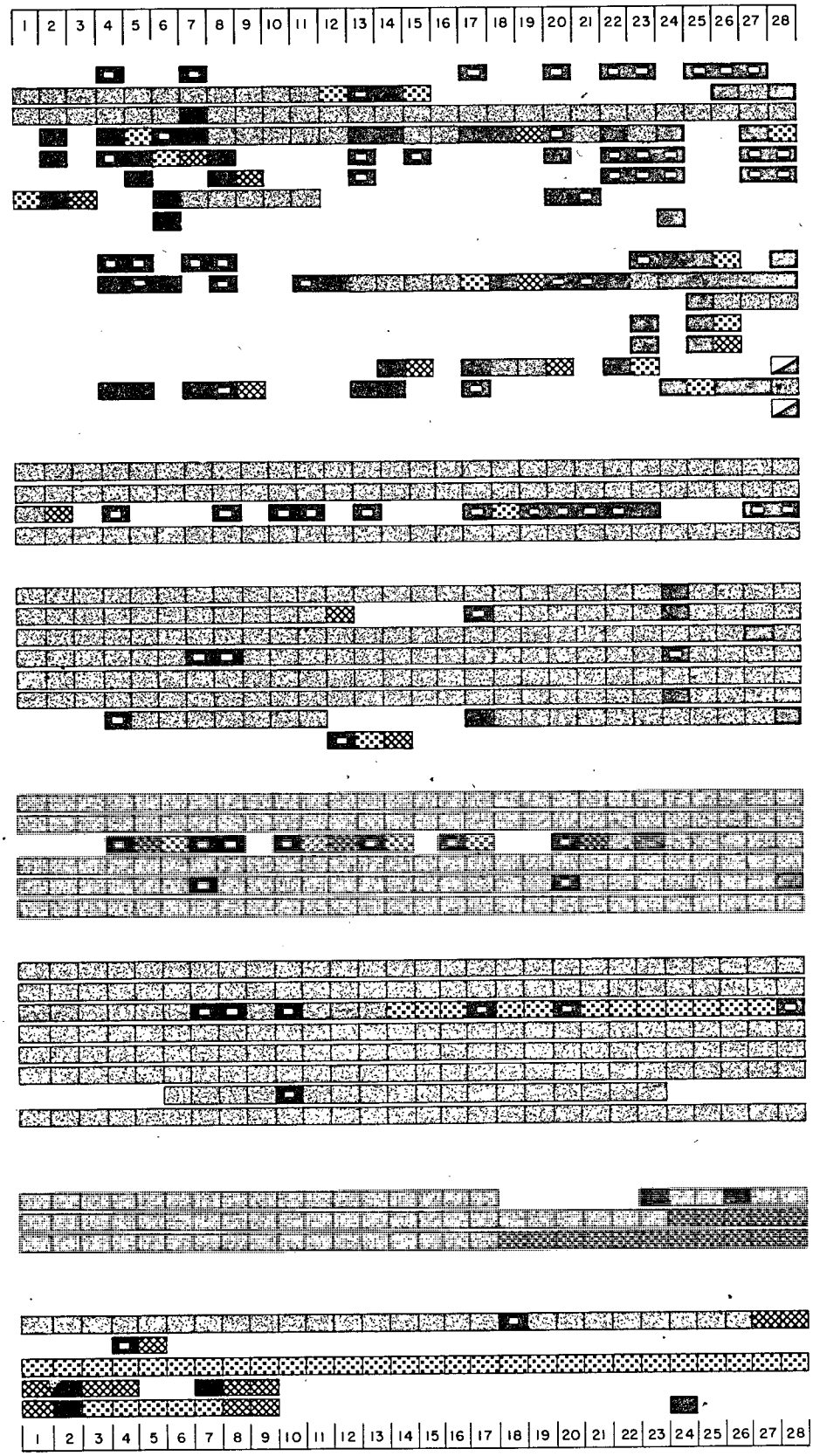
TRAIN AT CAMPOSAMPIERO

At least 15 wagons of a 25 wagon train were set on fire as the result on an attack by Spitfires of Desert Air Force just S.W. of the station at Camposampiero (N. of Padua) on 23 February 1945. This photo, taken by an F-5A of the 3rd Photo Group approximately 2½ hours after the attack, shows the fires still burning unabated and giving off intense black smoke.

RAILWAY TARGETS IN NORTHERN ITALY

ATTACK & PHOTO COVER STATUS CHART

FEBRUARY 1945



BRENNER PASS LINE:

(1) ORA RAIL BRIDGE
(2) SAN MICHELE RAIL BRIDGE
(3) AVISIO: RAIL VIADUCT
RAIL DIVERSION
(4) CALLIANO: RAIL BRIDGE
RAIL VIADUCT
(5) ROVERETO RAIL BRIDGE
(6) MORI RAIL FILL
(7) MORCO RAIL FILL
(8) SAN MARGHERITA RAIL BRIDGE
(9) ALA RAIL BRIDGE
(10) VIPITENO RAIL BRIDGE
(11) CAMPO: NORTH RAIL BRIDGE
SOUTH RAIL BRIDGE
(12) BRESSANONE RAIL BRIDGE
(13) ORA — SAN MICHELE RAIL DIVERSION
(14) PARONA RAIL BRIDGE

TAGLIAMENTO RIVER ZONE:

(21) TOMBA RAIL BRIDGE
(22) CASARA: RAIL BRIDGE
RAIL DIVERSION
(23) LATISANA RAIL BRIDGE

LIVENZA RIVER ZONE:

(24) SACILE: RAIL BRIDGE
* RAIL DIVERSION
(25) MOTTA DI LIVENZA: RAIL BRIDGE
RAIL DIVERSION
(26) TEZZE (SAN STINO) RAIL BRIDGE
(31) PORDENONE: RAIL BRIDGE
* RAIL BRIDGE DIVERSION
WEST RAIL BRIDGE

PIAVE RIVER ZONE:

(27) LENTIAI RAIL BRIDGE
(28) NERVESA: RAIL BRIDGE
*** RAIL DIVERSION
(29) PONTE DI PIAVE: RAIL BRIDGE
RAIL DIVERSION
(30) S. DONA DI PIAVE RAIL BRIDGE

BRENTA RIVER ZONE:

**(32) CISMON RAIL BRIDGE
(33) CITTADELLA: RAIL BRIDGE
*** RAIL DIVERSION
(34) PIAZZOLA: RAIL BRIDGE
RAIL DIVERSION
(35) PADUA/N: RAIL BRIDGE
*** RAIL DIVERSION
(36) PADUA/E. RAIL BRIDGE
(37) CAMPOLONGO RAIL BRIDGE

ADIGE RIVER ZONE:

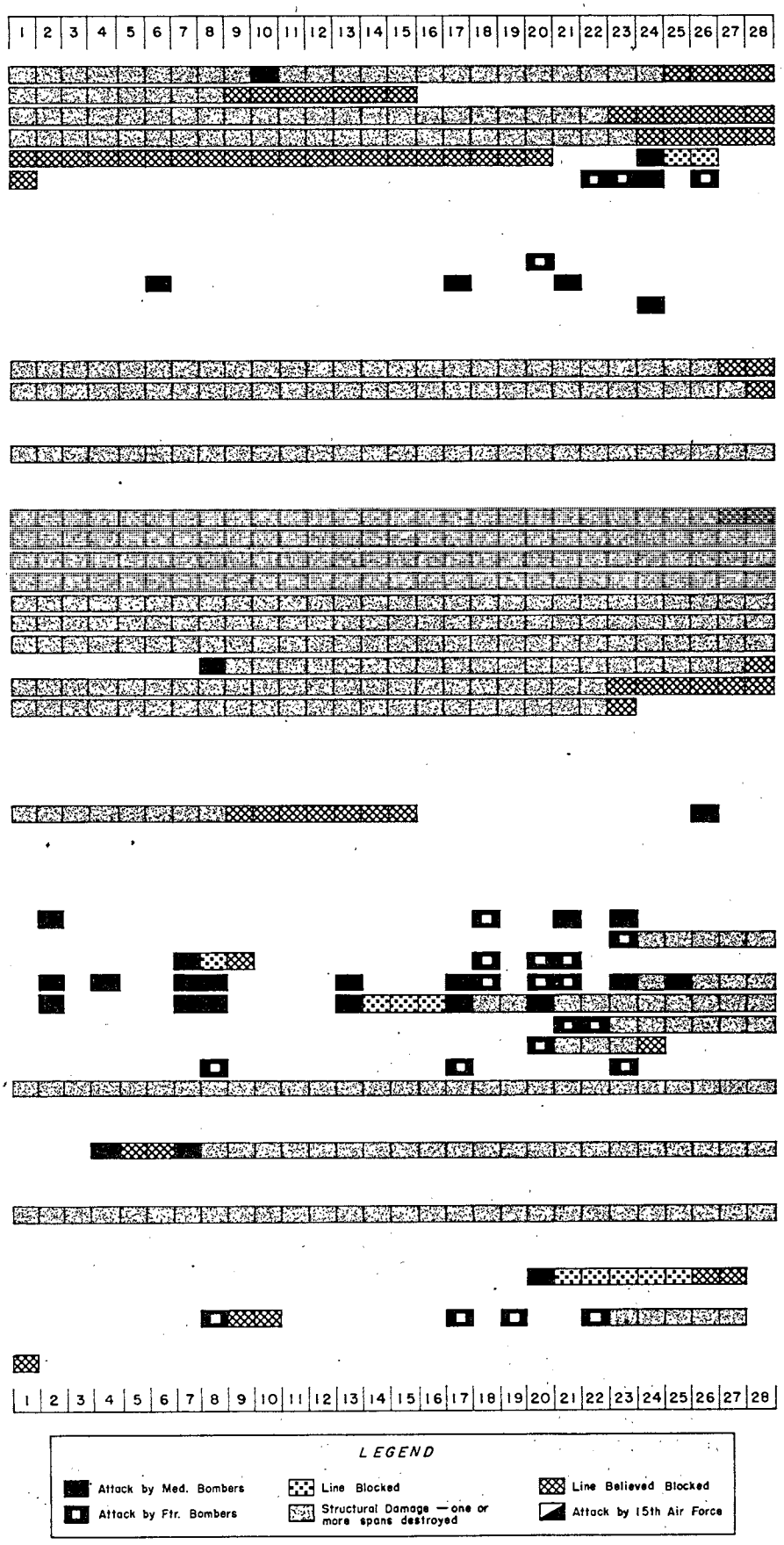
***(39) LEGNAGO RAIL BRIDGE
(40) ROVIGO RAIL BRIDGE
(41) CAVARZERE RAIL BRIDGE
(42) CAVANELLA RAIL BRIDGE

MINCIO RIVER ZONE:

(43) PESCHIERA: RAIL BRIDGE
RAIL DIVERSION
NEW RAIL BRIDGE
(44) MANTUA: RAIL CAUSEWAY
RAIL BRIDGE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

ATTACK & PHOTO COVER STATUS CHART (CONT'D)



*** Night Operational
** Probably Night Operational
* Suspected Night Operational

LAVIS RAIL VIADUCT

This photo of the 3,140-foot Lavis Rail Viaduct was taken on 25 February 1945, during a strafing and fighter-bomber attack by P-47's of the 1st Brazilian Fighter Squadron. It clearly demonstrates the effectiveness of M.A.T.A.F.'s attacks on this important link in the Brenner Pass Line.

As of that date, cumulative damage included: (1) One of the original 85-foot masonry spans at the southern end of the viaduct destroyed; (2) A second 85-foot span broken in half, as the result of a direct hit; (3) A third 85-foot span and a 50-foot span destroyed; (4) A 120-foot gap with three spans down, two of which are lying in the river bed; the southern span is supported at one end by its pier, the other end is in the river bed; (5) One pier heavily damaged; and (6) The north approach cut by a 25-foot crater.

satisfactory and the bridge at Bressanone, 55 miles north of Lavis, attacked on 14 February, was not repaired until 23 February. On 28 February, this target was re-attacked by the Fifteenth Air Force, and the damage inflicted is estimated to take at least ten days to repair. The significant features of the cutting of the bridge at Bressanone are the facts that it is the first time that the Brenner Pass Line has been blocked north of Bolzano in over two months, and secondly, and perhaps more important, it was done by medium bombers. Prior to this, the mediums had struck no further north than Ora, approximately 10 miles south of Bolzano. Until now the enemy has had practically continuous use of the Brenner Pass Railway north of Bolzano, sporadic attacks by heavy bombers having been largely ineffective. But with the bombing of the bridge at Bressanone, the zone of rail interdiction on the Brenner Pass Line was deepened by 30 miles, and the important rail facilities at Bolzano have become isolated. This will appreciably increase the enemy's difficulties in moving trains on this important route. There seems little reason to doubt but that our medium bombers can continue to maintain effectively this deepened zone of interdiction, if weather conditions continue to permit long-range operations.

In addition, temporary blocks were created at Campo di Trens (W-0910), but possibly the most important cut was at Vipiteno, 18 miles north of Bressanone. Vipiteno was attacked on 25 February, and the repairs are expected to take 5 to 7 days. With interdiction distributed along the Brenner Pass Line throughout its entire length, it quickly became evident that the policy of attacking as far north as possible was paying dividends, since the rate with which the enemy was completing repairs was noticeably declining.

With the Brenner Pass Line well interdicted, it might have been expected that some use would have been made of the Fortezza-Dobbiaco-Conegliano and the Trento-Cittadella Loop Lines. The latter route has been out during the entire month at Cismon by virtue of the fact that a 60-foot span is missing; it is significant, however, that whenever the approaches to this bridge are damaged, or other points on the line are temporarily cut, repairs are always effected without delay, suggesting that it may be "night operational". But frequent photo reconnaissance has not revealed any unusual activity along this line, nor have there been any ground reports to suggest that it is in use. As regards the alternate route via Dobbiaco, this would probably at best be used only for the transportation of troops, since trans-shipments would be necessary at both Dobbiaco and Pieve di Cadore, due to the fact that this stretch is narrow gauge electrified, while the remainder of the route is standard gauge steam. Some very slight activity has been noted, but nothing to indicate that this line is being employed for any large-scale troop movement.

While troops, by employing M/T or marching, could, and did, easily nullify these stoppages on the Brenner Pass Line, it was a totally different question as far as supplies and heavy equipment were concerned. Given ample supplies of petrol, these blocks would present no great obstacle, since recourse could be made either to trans-shipment around the blocks or to the use of M/T along the entire route. However, with fuel remaining such a critical item, as far as the enemy is concerned, he can ill-afford to indulge in the large-scale use of M/T for transport.

Northeastern Italy

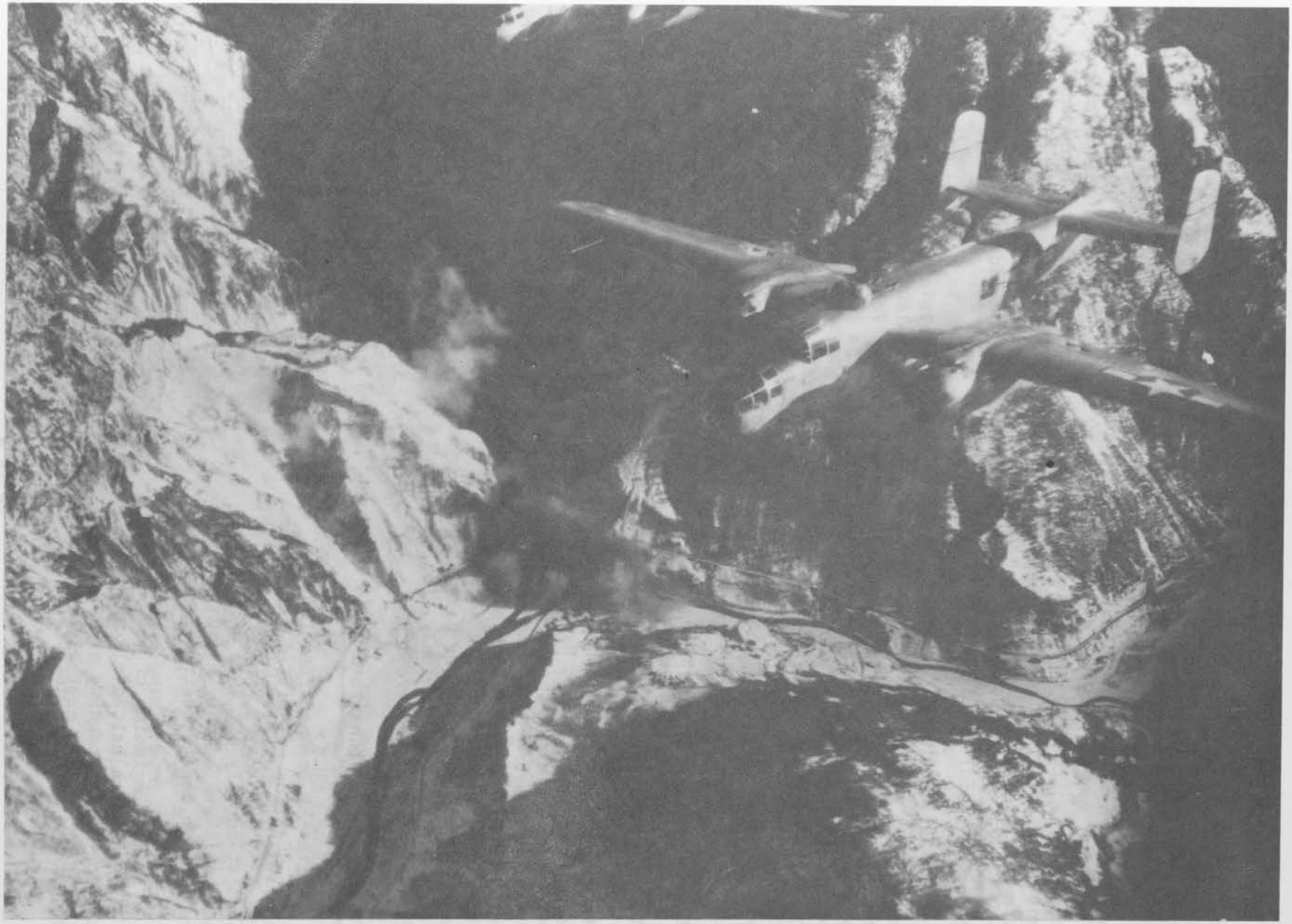
The outstanding feature of the month was the large increase of repair activity on the Northeastern Frontier Zone, and it became evident that the Germans were exerting their maximum effort to make at least two of the exit routes through this Zone serviceable. Work was concentrated on the Northern and Central Lines, as well as on the most easterly bridge on the Southern Line, at Latisana. At first the rate of progress on the construction of the new bridge at Latisana was by no means up to average, but toward the end of the month it had been expedited.

Repair activity was accelerated throughout February on the Central Route, on which the Padua/North, Ponte di Piave and Motta di Livenza bridges are located. It was apparent that an intensive effort was being made to open up another link with the Northeast, since with the Central Route open, it would not be imperative to have Latisana passable. However, if the repairs on the Latisana bridge could be completed at more-or-less the same time as those at Motta di Livenza and Ponte di Piave, then traffic could be routed direct from the Po Valley to any one of the three Frontier Routes.

By 20 February, the diversion bridge at Ponte di Piave required only a very few hours of work to make it serviceable, and for the repair crews it must have been a very discouraging experience to witness a fighter-bomber attack on that date, which not only destroyed all their repair efforts, but so increased the damage that the diversion was impassable for the remainder of the month. The Padua/North bridge, which can be utilized to feed both the Central and Northern Lines, was found to be "night operational" early in the month, and it probably continued so throughout February. Day photography invariably revealed one span missing, but it was significant that any cratered approaches, resulting from fighter-bomber attacks were repaired with a minimum of delay. Furthermore, a night photograph taken on 25/26 February showed the missing span in place and the bridge serviceable.

All along the Northern Route the tempo of repair activity was at its height, and by exerting a maximum effort the enemy succeeded in keeping the line open for four days from a point east of Cittadella at least as far as Chiusaforte, by virtue of either a bridge or a diversion being passable at each river crossing. However, it is not probable that any great volume of traffic was enabled to move eastward, since there were only two points across the Brenta River by which rolling stock could travel — the bridge at Padua/North and the diversion bridge at Cittadella. Although the former is known to be "night operational", the latter has never been substantiated as such, notwithstanding the fact that all available evidence indicates that it only requires a 12-foot span to make it serviceable. Ground sources and P/W's continue to report on the difficulties encountered in traveling by rail in this area, and it is evident that repair facilities are being taxed to their maximum.

On the Northeastern Frontier Routes, the viaduct at Borovnica on the Postumia Route remains impassable. With respect to this target, it is in-



DOGNA RAIL BRIDGE

On 2 February 1945 a formation of 18 B-25's of the 57th Bomb Wing attacked this target on the important Tarvisio Rail Line. A total of 72 x 1000 lb. G.P. bombs were dropped, cratering the north approach.

teresting to note that the enemy has seen fit to devote what must be considerable engineering facilities to the repair of this heavily damaged large rail viaduct, and to the construction of a difficult rail diversion at the same point. This obviously suggests that the Germans attach considerable importance to this line, although it is essentially a secondary line, as compared to the Brenner and Tarvisio Routes. Behind this repair effort is seen the basic vulnerability of the enemy's lines of communications. The route from Trieste to Ljubljana is one of only four railroads available for military traffic moving to or from points outside Italy, and we have already demonstrated our ability to block all four simultaneously for a not inconsiderable period, even under rather unfavorable weather conditions.

With respect to the Postumia Route, between Trieste and Ljubljana, a service is at present operating as far as Longatico (D-1802). From this point passengers transfer to M/T, which carry them as far as Vrhnika (D-2309), the terminal of the branch line leading to Ljubljana. The Piedicolle Line was open until 7 February, when all spans of the bridge at Canale di Isonzo (Bodres) were destroyed. (This bridge was possibly impassable at the time of this attack, as the result of the bombing on 4 February.) In addition, the bridge at Salcano is also damaged at present, halting all through traffic.

The Tarvisio Route was passable at the beginning of the month and proved difficult to interdict with any degree of certainty until 17 February, when two spans of the bridge at Chiusaforte were destroyed. Ground sources, however, stated that the line was successfully blocked on 7 February, and since that date all traffic has been halted. In view of the importance that the Germans attach to this route, it was decided to reinforce the Chiusaforte bridge block, and in consequence the bridge at Resiutta (C-3956), Dogna (C-458655) and Dogna Town (C-476622) were all attacked in rapid succession, with the result that at least one span was destroyed at each bridge, providing a total of four major blocks over a distance of approximately 7 miles. Although there was a short period during which through traffic could proceed as far as Chiusaforte, photo reconnaissance during the latter half of February revealed that the scale of interdiction in Northeastern Italy, including the Frontier Zone, was the highest that has yet been achieved.

Po Valley and Northwestern Italy

With the Brenner Pass Line and the Northeastern Frontier Routes being allocated as top priorities, any attacks by our medium bombers in Northwestern Italy were due to the primary objectives being weathered-in. Conditions were such that on only six days of the month were alternates bombed, and on each occasion it was by only a small percentage of aircraft, since most formations were able to locate their primary targets.

At the beginning of the month there was a zone of interdiction north of the Po, which halted all west to east traffic between Milan and Verona, but owing to the paucity of effort available, it was not possible to maintain this. However, the most direct lines were denied to the Germans throughout

the month, and rail traffic had to be routed by one rather devious and round-about route. The bridge at Calcinato, which was damaged during the middle of the month, was repaired to a sufficient extent so that by 25 February it could again be employed at night. But, with the exception of permitting traffic to be shuttled between Brescia and Verona, no great use could be made of this main east-west line.

The Po River showed no undue activity, and movement was confined to the principal pontoon bridge and ferry sites. Night photos of 25 February again confirmed that a pontoon bridge across the Po at Polesella, northeast of Ferrara, is assembled at night. The only important development, however, has been confirmation of the fact that the bridge at Piacenza, which was attacked on 8 February, is impassable. This leaves only one bridge west of Piacenza, at Casale Monferrato, by which rail traffic can pass. While the bridge at Torreberetti is impassable, it lacks only one span and can probably be made "night operational" at will. One interesting fact is that there is further evidence from photo reconnaissance that the bridge at Legnago, on the line between Ostiglia (an important rail ferry and possible night pontoon bridge site) and the Padua Area, was found to be "night operational". This target was attacked on 23 February and sufficiently damaged so as to prevent its use in this manner, at least temporarily. Some rail activity was reported during the month south of the Po, showing that the enemy continues to rely to some extent on rail transport in this area.

TRAIN NEAR VILLACH

On 27 February 1945 this train, consisting of one locomotive and seven coaches, was attacked by two formations of P-47 fighter-bombers — one from D.A.F. and the second from XXII T.A.C. — near Villach, Austria. The photo on the left, taken during the second attack, shows that the locomotive was severely damaged. It is emitting large quantities of steam and smoke; at least four of the coaches have been set on fire.

MOVEMENT OF ENEMY SHIPPING

On the Ligurian coast, the ports of Genoa, Spezia and Savona continue to be active. Since the first of the month, 3 K.T. ships continued to traffic regularly between the ports of Genoa and Spezia, but photo cover on 20 February showed 2 of the 4 active vessels to be in dockyard hands at Genoa. In addition to the regular K.T. traffic between Genoa and Spezia, the 1,000 ton M/V Dominante, previously sailing between Genoa and Savona, has made the Spezia run at least once during the month. At Spezia, the 480' M/V (M.712), sunk in December 1944, has been raised and moved from its position in the bay to a drydock. The last photo cover of this vessel showed the drydock to be flooded with its gates open, probably indicating the early departure of the M. 712. It seems probable that this vessel will be used as a blockship at the western entrance of the harbor.

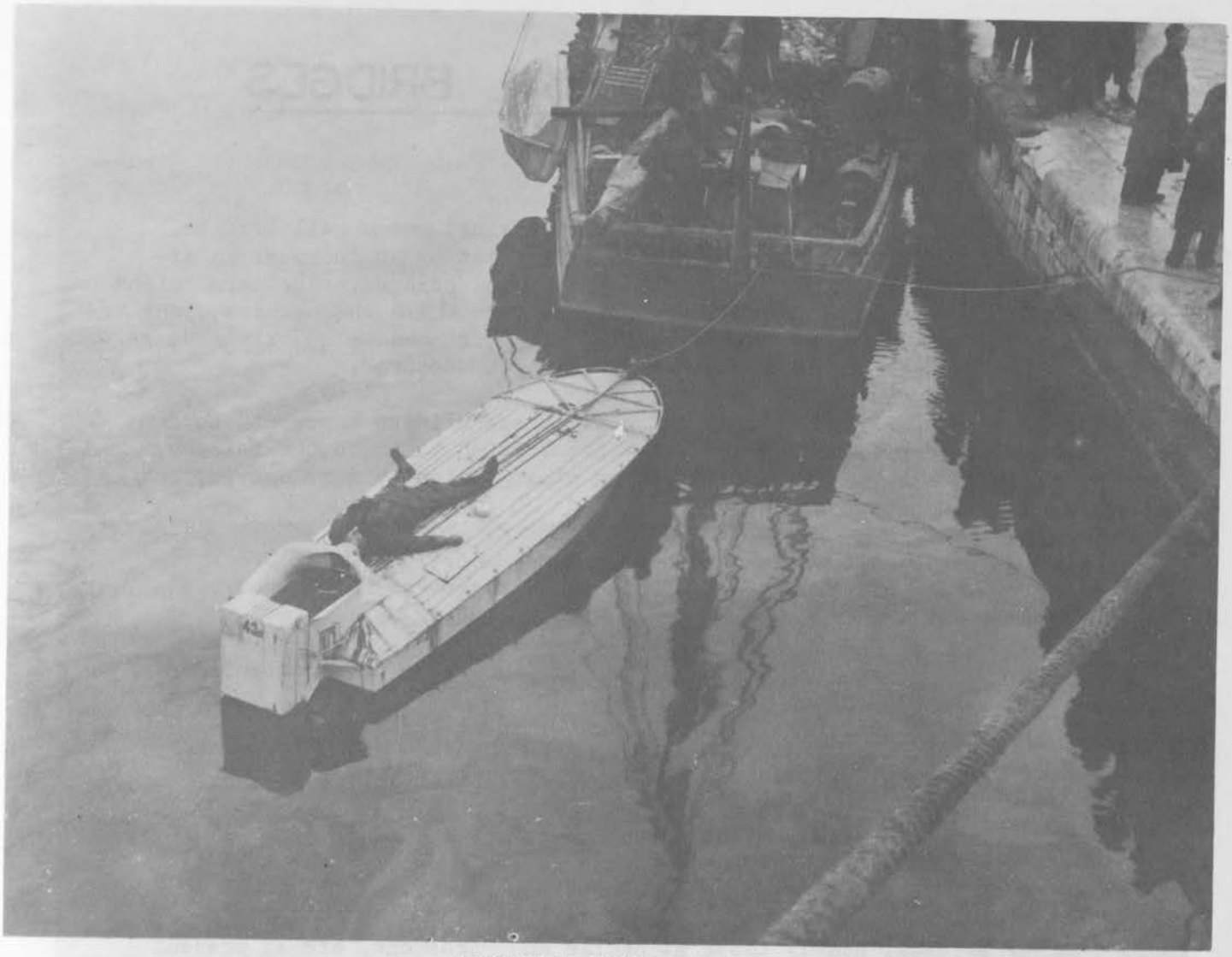
In the Northern Adriatic, the bombing of Trieste, Pola and Fiume resulted in a general exodus of shipping, and a resulting increase in activity was noted at Venice, Porto Marghera and Arsa Channel. Attacks by M.A.S.A.F. caused considerable damage to port installations and naval units, with lighter damage to the merchant shipping fleet. The attack on Trieste was the most successful, with the resulting loss to the enemy of the M/V Pluto (ex-Dalesman), two inactive M/V's, as well as several coasters fitting out in the Muggia Yard. Photo cover during the latter part of February showed the return of several vessels to Trieste, namely, the M. 1152, which arrived at Trieste from Porto Marghera by 23 February, the M/V Otto Leonhardt, which arrived from Venice at the same date, and 3 coasters from various ports. The active movement of coasters, F-Boats and supply barges has continued, with an effort being made to speed up the turnover of small vessels to compensate for recent losses among the larger ships.

The M/V Mediceo (5,100 tons) is known to have left Venice by 31 January, but has not been reported by photo reconnaissance since that date. It would seem possible that she was the large vessel torpedoed by British Coastal Forces off Caorle on the night of 12/13 February.

Pola continues to be the main naval base for enemy units in the Adriatic, with recent activity noted among the MAS and small submarines. Fiume continues to house the small craft supplying the northern islands and the Croatian coast.

DISPOSITION OF NAVAL UNITS

Movement of naval units in the Adriatic included the arrival of two War Partenope T/B's at Venice from Trieste, and the arrival of three auxiliaries at Trieste — two from Venice and one from Pola. During the recent bombing attacks at Trieste and Fiume, the enemy lost the battleship Cavour, which has capsized, a Navigator-class destroyer, a War Partenope T/B, a T/B of 180', and the newly-completed auxiliary minelayer Locchi; a second War Partenope T/B was damaged in dry dock. There is little the enemy can do to replace these losses, although the destroyer Beograd has now completed her refitting and has probably concluded her trials. There are few other vessels available for service without extensive repairs and refitting.



EXPLOSIVE MOTOR BOATS

The above photograph shows the type of one-man explosive motor boats used by the enemy in the Adriatic. This craft, the "43-B", was brought into Zara Harbor by a fisherman at the beginning of December 1944.

The "MTM" are constructed of very light plywood, have a speed of 30 to 35 knots and an endurance of 90 miles. The 350 Kg. explosive charge is carried in the forward half, petrol is stored amidships, and the motor placed well aft driving a double propeller. The pilot's seat is combined with a life raft, which can be detached as the attack is made.

Several operations have been carried out, the latest being the attack on shipping in Split Harbor on the morning of 12 February. At least 5 of the explosive motor boats were engaged in the assault. One of the craft exploded against shipping, damaging two vessels; while two others were blown up by gunfire. Due to the distance between the scene of the attack and the probable base (Pola), it may be assumed that the assault boats were escorted or possibly carried to within striking distance by E-Boats or Torpedo Boats.

NIGHT OPERATIONAL BRIDGES

The increased intensity of our attacks against enemy rail bridges, since the middle of January, has been partially met by an increase in attempted deception in the form of night operational bridges. The term "night operational" is used to include those bridges from which one or more spans are removed to make them appear unserviceable, and which can be quickly made serviceable again at night, or at such time as may be desired.

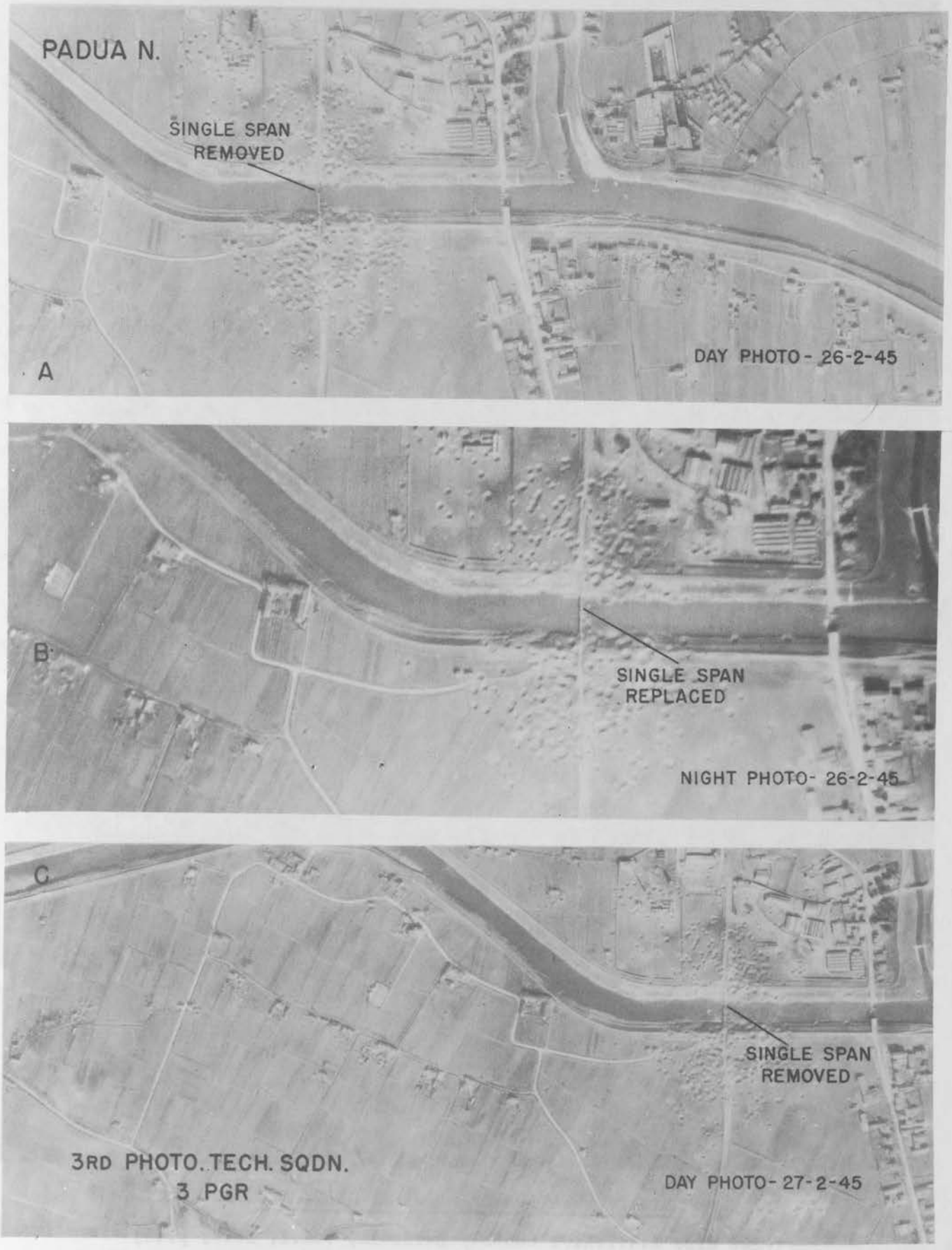
Because of the missing span or spans, these bridges appear to be damaged to our air-crews, who, unless they are briefed to avoid the fallacy, may withhold attack in favor of attacking other obviously serviceable, but possibly less important bridges.

During the last few weeks, the Bomb Damage Section of the 3rd Photo Technical Squadron has reported the following bridges as night operational, or very probably so:

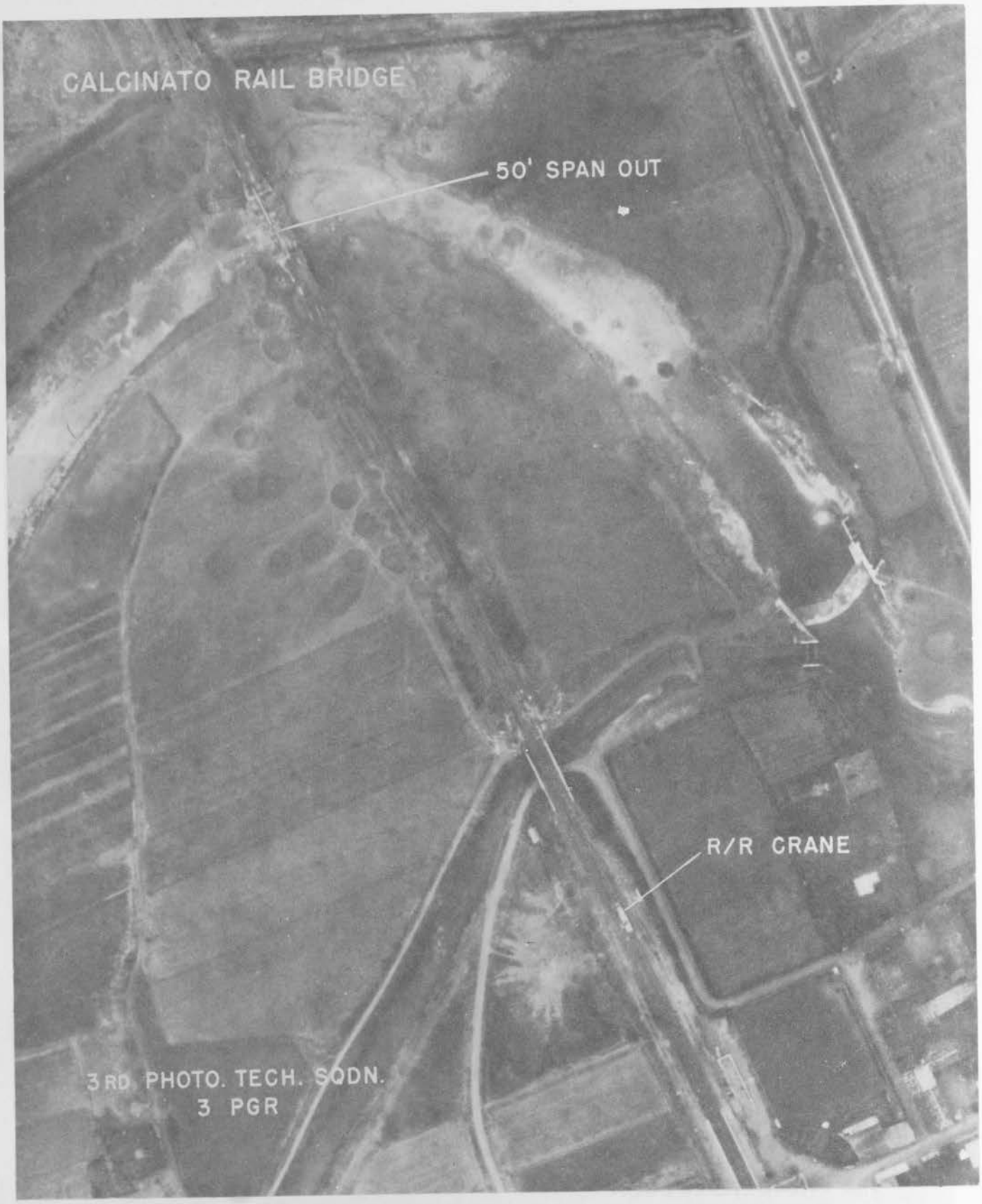
CALCINATO	- see illustration of bridge and crane; status confirmed by night photos.
PADUA/NORTH	- confirmed by night photos; see illustrations.
TORREBERETTI	- see illustration.
LEGNAGO	- night operational prior to recent attack; must await further cover for new status.
CISMON	- probably night operational.
CITTADELLA	- single 12-foot span can be set manually; see illustration.
NERVESA	- two 12-foot spans can be set manually.

Other bridges, namely those at Sacile and Pordenone, are at present under suspicion and are being observed.

The bridge at Padua/North is cited as an example to illustrate the pattern by which a night operational bridge can be recognized. A span, about 50 feet long, was seen to have been removed from the bridge between covers of 31 January and 6 February; there was no evidence of attack. The bridge was regarded immediately with suspicion. A search revealed that a crane, similar to that at Calcinato, was present at the nearby station yard. Subsequent covers showed that the approaches were persistently repaired following attack. Although a certain amount of inactive rolling stock was observed, a single track was always kept open, and activity studies revealed turnover of rolling stock on the lines on either side. Furthermore, the bridge was of the utmost importance, and a damaged span could have been easily repaired in a short time. On the basis of the accumulated evidence, the bridge was reported as night operational. Confirmation was received when a night sortie, flown 26 February, revealed the span to be in place (see illustration B). Cover of that afternoon (see illustration A), and the following day (see illustration C), revealed the span to be removed.

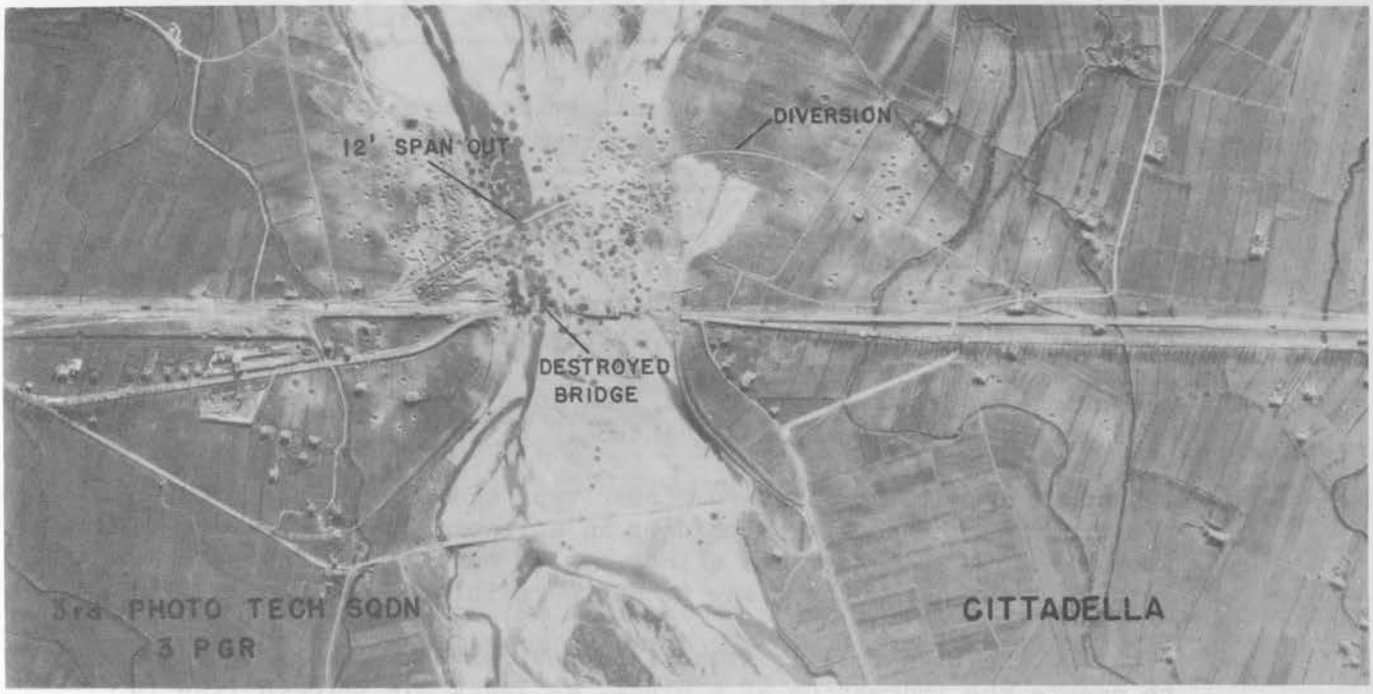


NIGHT OPERATIONAL BRIDGE AT PADUA/NORTH

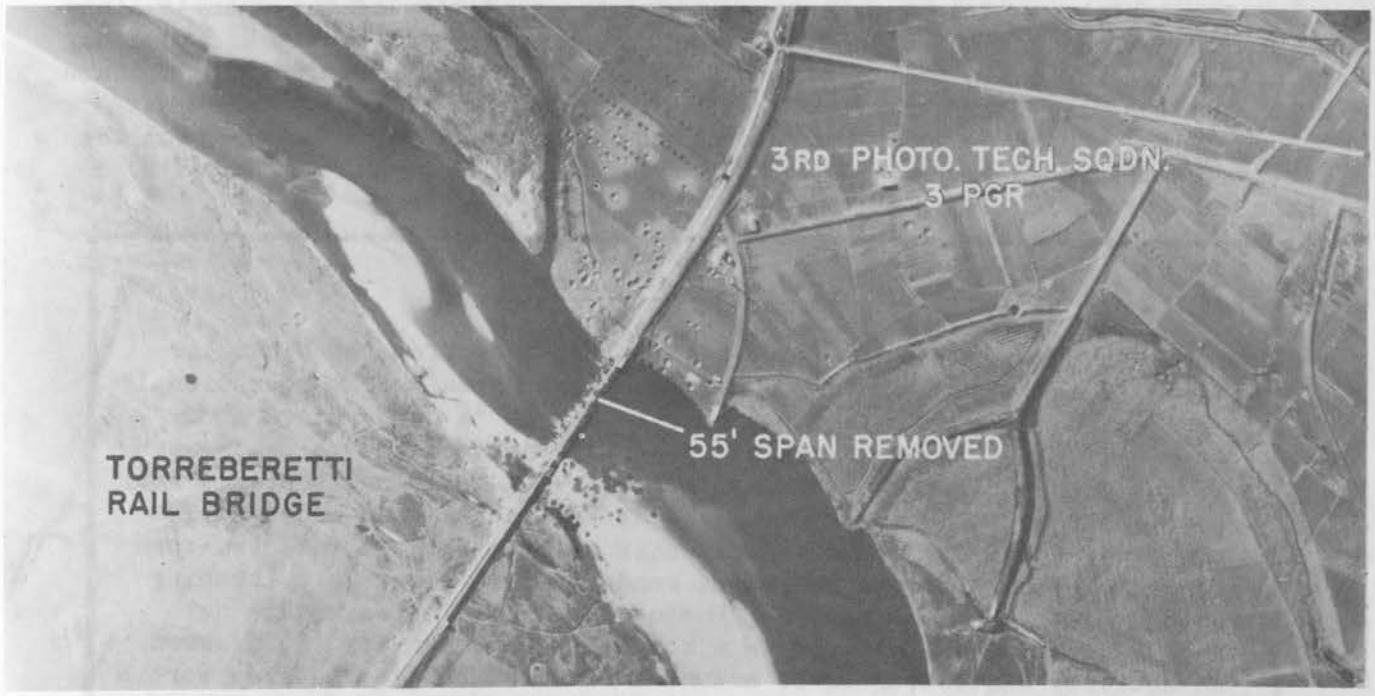


NIGHT OPERATIONAL BRIDGE AT CALCINATO

(See also M.A.T.A.F. Monthly Bulletin, Vol.I, No.2, p.43)



PROBABLE NIGHT OPERATIONAL BRIDGE AT CITTADELLA



PROBABLE NIGHT OPERATIONAL BRIDGE AT TORREBERETTI

The pattern by which a night operational bridge reveals itself is so consistently similar as to make its existence readily apparent, as the result of the following features:

a. It is usually first detected by the removal of one or more spans.

b. Subsequent damage is consistently repaired, although the missing span, or spans, are not replaced during the day.

c. The bridge is invariably a vital link in a line on which all other bridges are repaired following attack.

d. The spans are of the standard girder type used by the enemy for the construction and repair of bridges in Northern Italy. They are of such a length that they can either be set manually or with a crane. In the latter case, the crane is often visible.

e. Although inactive rolling stock is sometimes kept on the approaches to create the impression of a block, at least one through line is kept clear.

f. Activity studies show movement of rolling stock on the lines on either side of the bridge.

It might be anticipated that, provided the condition of the enemy's lines of communication continues to deteriorate, the greater will become his tendency to utilize deception in maintaining his remaining serviceable bridges. Because of the engineering requirements of railroad structures, however, it is not thought likely that the method of deception can be varied appreciably from the pattern as described above, and any new attempts can be readily detected by photo interpretation.

THE NIGHT LIFE OF A BRIDGE

In a recent intelligence summary received from the Ninth Air Force, a new method of enemy deception as regards "night operational" bridges is reported. This report states that "a comparative study of recent aerial photographs has revealed what appears to be the use by the enemy of a clever device to preserve a newly-built bridge from aerial attack. The point at which the device has been employed is the site of the bridge across the SAAR River. The original two-span concrete highway bridge there was rendered unserviceable by bombing on or about 28 December 1944. Photo cover flown between this date and 2 January 1945, as well as a sortie flown 5 January 1945, shows no activity whatsoever on or around the ruined bridge; but the sortie flown 13 January 1945 reveals a startling change; The framework of a new bridge, apparently of the steel girder type, has been built just north of and parallel to the earlier one. In a night photograph, 13 January 1945, a complete flooring, probably of wood, has been laid on this framework. Cover flown on 14 January 1945 shows the bridge, strangely enough, to be once again without flooring."

ENEMY RAIL DIVERSIONS

A COUNTERMEASURE TO INTERDICTION

In an attempt to counter M.A.T.A.F.'s sustained program of interdiction of rail communications in Northern Italy, the enemy has been forced to build up a vigorous and versatile repair organization, much of whose effort has been concentrated on the construction and maintenance of rail diversions by-passing vital bridges — diversions which can be quickly built, and of such construction that they can be easily repaired.

The optimum effect that the enemy could obtain for the circumvention of our program of interdiction would be to build diversions, which by-pass existing important bridges, and to maintain both bridge and diversion simultaneously. By so doing, they would impose upon us the necessity of cutting both in order to create a satisfactory block, and thus multiply the probabilities against achieving our purpose.

Despite the energy of the enemy engineering organization, however, its capacity is limited. It is apparent, on the basis of the extent of interdiction imposed during recent months, that the amount of repairs that can be accomplished at any given time is below the demands our effort has imposed, and only in a limited, and now decreasing number of cases, have they been able to maintain both the bridge and its diversion together.

In practice, therefore, except in about three cases, the diversion has become no more than a replacement for the damaged bridge. As such, it enjoys a limited advantage in that it requires less time to build, and maintain a diversion bridge than to repair an original bridge of long spans, which is heavily damaged and difficult to repair.

THE LOCATION OF IMPORTANT DIVERSIONS

As might be expected, diversions have been constructed on those routes which have been of greatest importance to the enemy, and which have been most frequently subjected to our attack. Although there are several diversions in existence in the west, the most conspicuous examples are those on the Brenner Pass Line to the north, and on the Tarvisio and Piedicolle Routes to the northeast.

On the Brenner Pass Line, between Trento and Bolzano, diversions exist at Lavis (Avisio), at San Michele to Ora, and at Bolzano. The absence of diversions south of Trento might be explained by the existence of a by-pass line from Trento south to Castelfranco Veneto. North of Bolzano, the need for diversions has not been so pressing, since it is on the outer perimeter of the range of our medium bombers.

On the lower route to the northeast, the bridges at Ponte di Piave and

Motta di Livenza are virtually destroyed, but diversions exist at both locations, while further east at Latisana a diversion is under construction.

On the Tarvisio Route, the most frequently attacked targets — Cittadella, Nervesa, Pordenone, and Casarsa — are by-passed by diversions, while at Sacile, where the tempo of attack has lately been increased, a diversion is under construction.

THEIR CONSTRUCTION

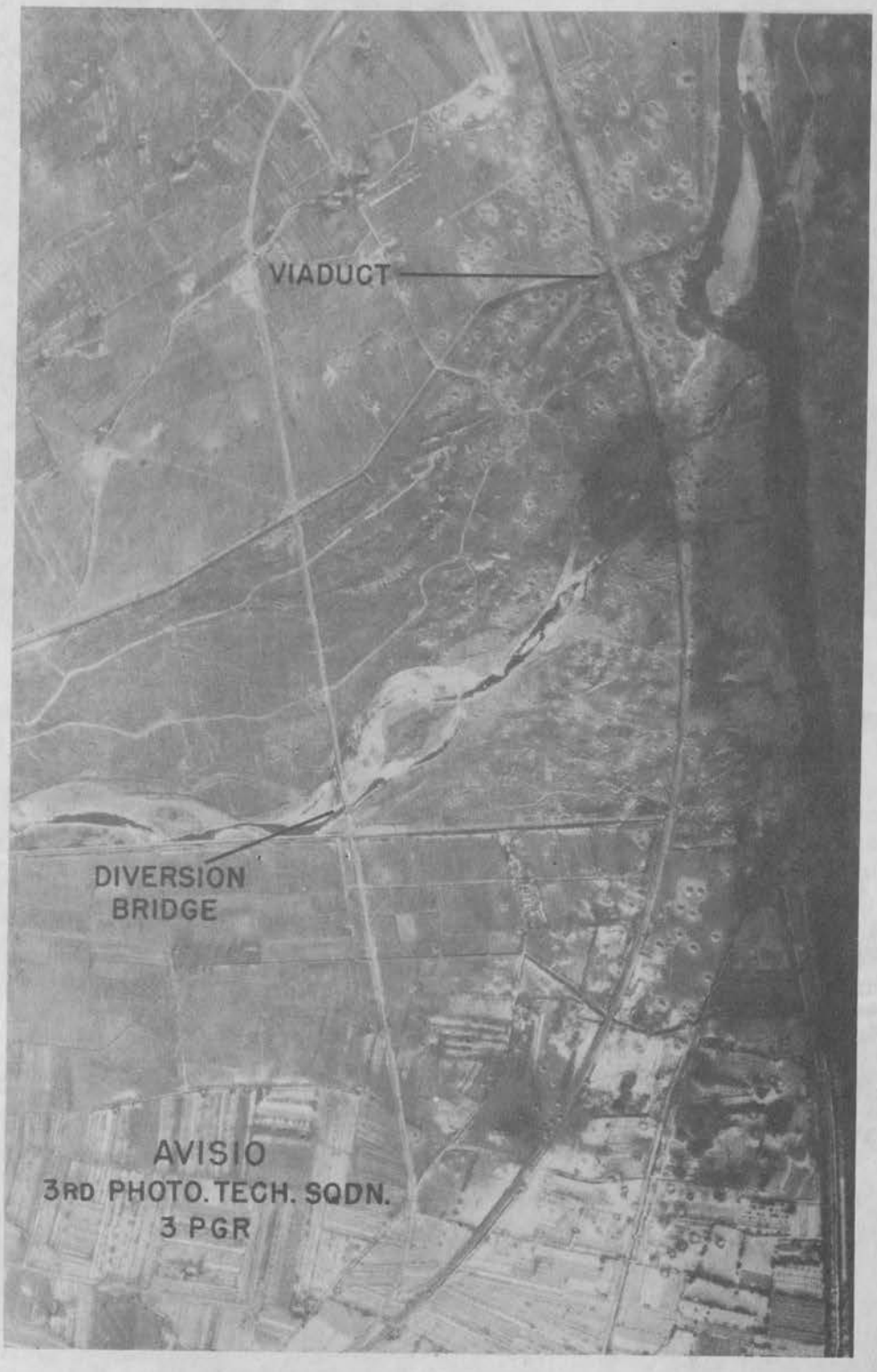
Photo Interpreters of the Bomb Damage Section of the 3rd Photo Technical Squadron have been able to observe the scope of the enemy's effort, and have been able to provide data concerning the construction of diversions, their vulnerability to attack, and an estimate of the time required for their repair. The construction of diversions can be divided into three main categories, two of which are adapted to the terrain of the river at the point of crossing, and the third to the peculiar demands of the location.

Almost half of the existing diversion bridges are constructed over relatively wide shallow river crossings. The outstanding feature of such a site is that the greater part of the road bed is laid on fill embankments over sections of dry river bed. The structure over the river channel is made up of girders of varying lengths supported on timber piers at about 15 foot intervals. The timber piers are most probably set on mud-sills.

The advantage of this type of construction is that the necessity for a long bridge structure is eliminated by the fill embankments over the dry bed. In addition, the short piers, set roughly 4 to 6 feet above mean water level, are relatively easy to erect, and because the spans are short, can be bridged by light structural members. The most outstanding examples of shallow river construction are those diversions at Nervesa over the Piave River, and Casarsa over the Tagliamento River. At the former location, where the river crossing is 1,550 feet wide, the bridge structure has been reduced to 500 feet by the use of fill embankments. At Casarsa, a 2,750 foot river bed has required only about 650 feet of bridging.

It has been found that cuts on the embankments are repaired in a very few hours, while a single hit by a 500 lb. G.P. bomb on the bridge structure can be repaired in about three or four days. Since the bridge structure is often difficult to distinguish from the fill embankments, hits are most frequently inflicted on the latter where the effect of the damage is almost negligible.

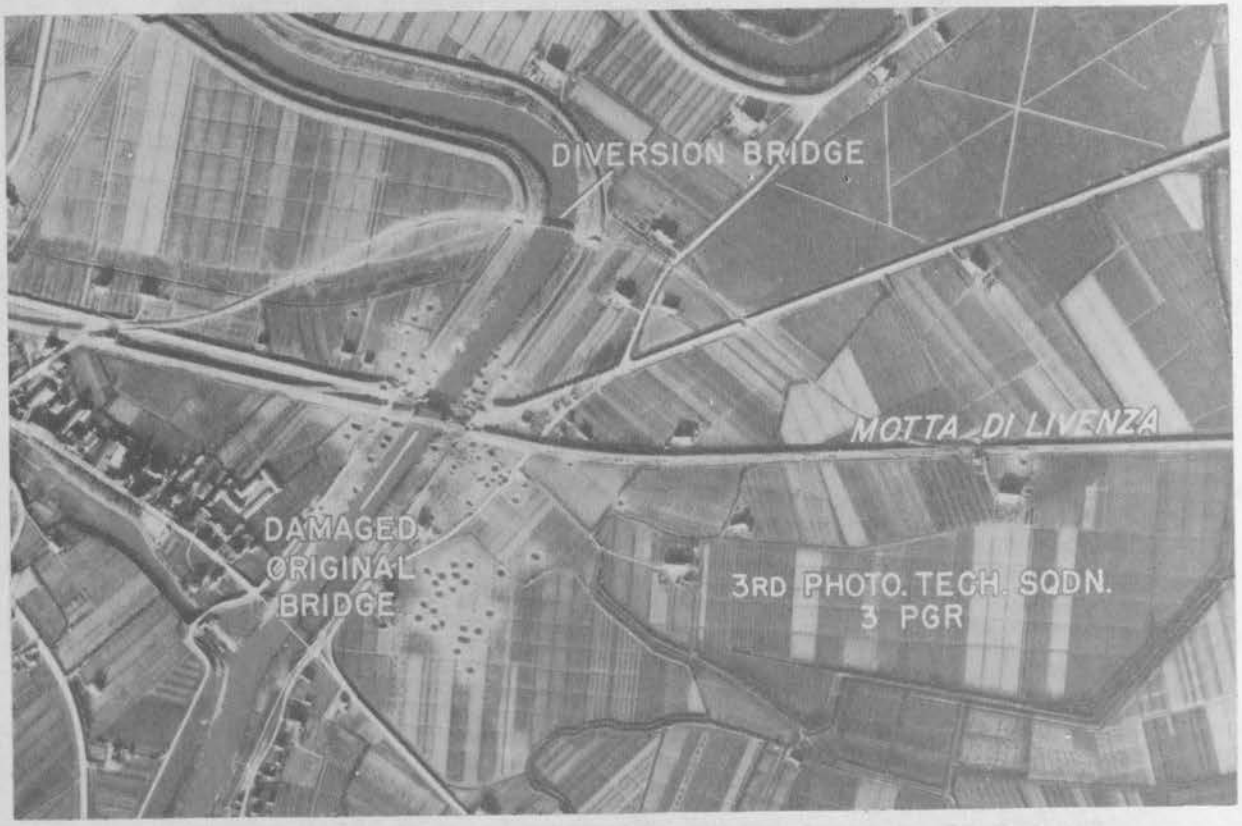
Somewhat more numerous are the diversion bridges constructed over the narrower, deeper river crossings. Typical of these are the bridges at Motta di Livenza, at Pordenone, and at the end of February those under construction at Sacile and Piazzola Sul Brenta. The height of the piers varies from 12 to 25 feet above mean water level, and they are usually of timber construction, either columns or cribbing on mud-sills. They are spaced at 40 to 60 foot intervals, often supplemented by light auxiliary piers, and are bridged by steel girders.



AVISIO VIADUCT AND DIVERSION

The diversion whose bridge structure is only 265 feet long by-passes a viaduct of over 2,800 feet.

A typical "shallow river" diversion bridge.



A typical "deep river" diversion bridge.

MOTTA DI LIVENZA

The diversion bridge, stripped for repair, reveals the timber construction of the piers used for "deep water" bridges. In the background is the severely damaged main bridge, by-passed by the diversion.

The length of the bridge structure varies from about 250 to 400 feet. In four cases where it has been possible to estimate time of construction from photographs, it took an engineering crew about two weeks to completely erect a bridge structure from the time at least one of the approaches was prepared. Time for repairs to these large bridges is naturally somewhat more lengthy than repairs to shallow water diversions. A typical repair job is the erection of one pier and two spans, which never takes less than about four days, and usually about seven. The most difficult part of the job appears to be the erection of the pier, following which the spans are laid in about 24 hours.

It has been shown throughout that the effectiveness of a system of diversions as a countermeasure is inseparable from the requirements of an engineering organization of sufficient capacity to keep up with the demands of our attack. The record of interdiction imposed since the middle of January is prima facie evidence that the engineering organization has failed. If the present scope of attack persists, it is highly improbable that, with his existing organization, the enemy can build and maintain his diversions to such an extent that they can constitute a serious obstacle to our program of interdiction.

In the third category are those diversions which might better be described as loop-lines. Most prominent is the 12 mile stretch of line between Ora and San Michele, completed in November, which by-passes two of the most vulnerable targets on the Brenner Pass Line. To our disadvantage, the diversion has only one possible point where a block could be effective,

Another diversion in the nature of a loop-line is at present under construction by-passing the severely damaged viaduct at Borovnica. The diversion, construction of which is not likely to be completed before April, has been run through approximately two miles of the most difficult terrain by the use of cuts, fills, sharp curves, and small viaducts. It is an example that is notable in illustrating the phenomenal effort which the enemy will expend to keep open his most important routes.

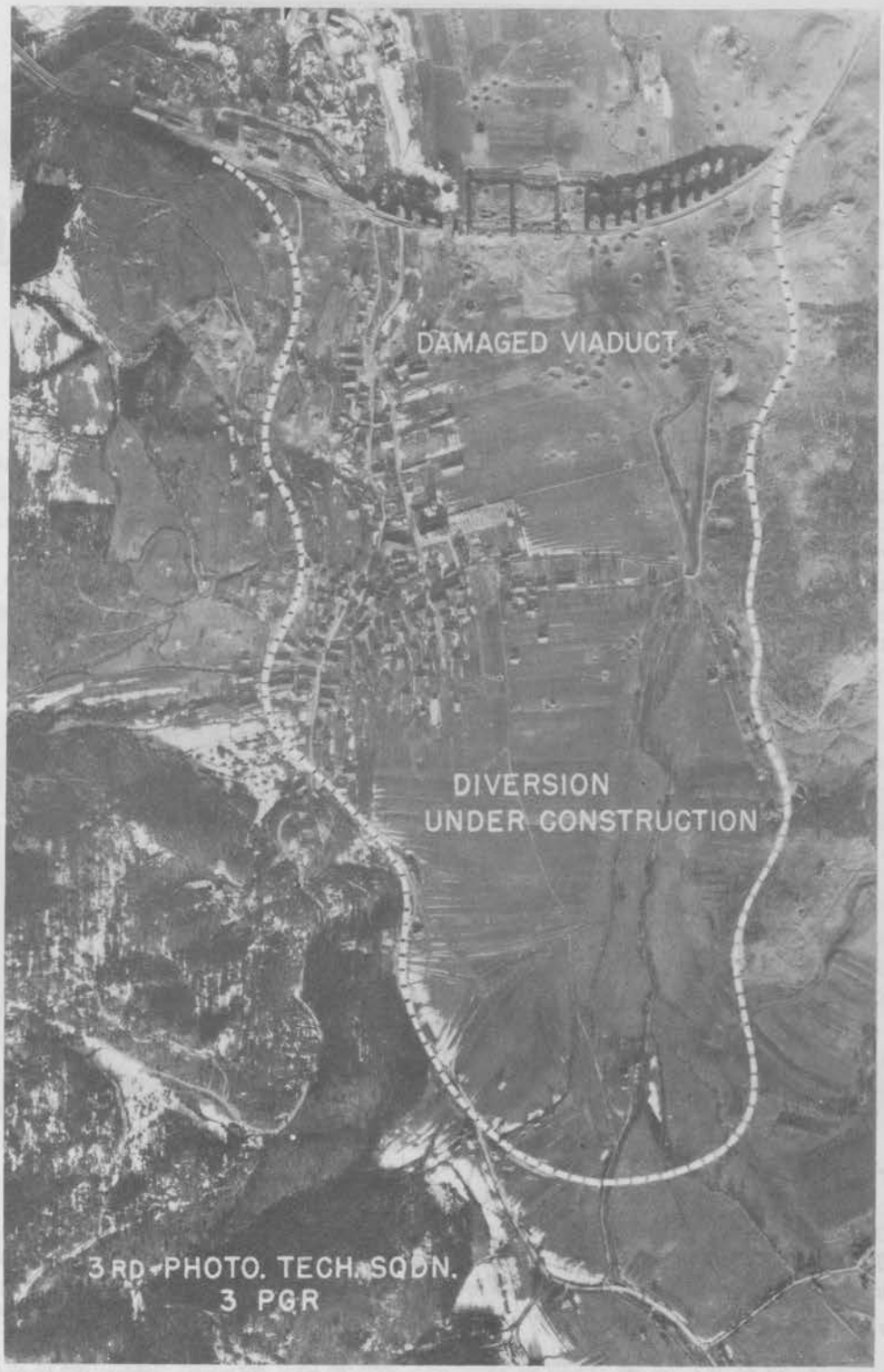
THEIR EFFECTIVENESS AS A COUNTERMEASURE

It is undoubtedly true that certain advantages have accrued to the enemy by their use of diversions as a countermeasure. When it has been possible to provide engineering crews to maintain the original bridge and its diversions simultaneously, the device has been effective. A most outstanding example is the Ora to San Michele complex on the Brenner Pass Line, where, despite frequent attacks, traffic has only been interrupted for insignificant periods since the construction of the diversion was completed in November. Prior to February, the device had been comparably effective at Lavis (Avisio), also on the Brenner Pass Line, and at Nervesa and Casarsa on the Tarvisio Route.

The diversions have been effective, too, in that they are of a design which considerably reduces the size of the bridge structure, thereby increasing the difficulty of scoring a damaging hit. As a replacement bridge, the diversion's most appreciable value to the enemy is that it provides a structure that can be built in less time than it would take to restore the original bridge, and when damaged can be quickly repaired by the use of relatively light, easily handled materials and standard repair methods.

The same characteristics of construction which make a bridge easy to repair, however, make it easy to damage. Proof of this is the excellent record of interdiction our fighter-bombers have maintained recently on the two routes to the northeast. Despite a persistent effort to make the diversions serviceable, the structures at Ponte di Piave and Motta di Livenza on the lower line, which remained out near the end of February, have been kept out since 17 January, while on the upper line the diversion at Pordenone has only been open for two or three days during the same period.

With the approach of spring thaws, moreover, it might well be anticipated that the enemy will lose considerable use of their shallow water diversions, certain of which are likely to become inundated or washed out, as happened last fall at Nervesa, Casarsa, and Tortona.



BOROVNICA

The dotted line indicates the approximate route of the diversion at present under construction. When completed, it will by-pass the seriously damaged viaduct. The diversion line is about two miles long over the most difficult terrain.

TACTICS

I. ANTI-FLAK MEASURES EMPLOYED BY THE 57TH BOMB WING

A review of German flak defenses in Northern Italy shows a continued increase in the number of heavy gun positions. As his air power has steadily declined, the enemy has to rely more and more on A.A. defenses. An even greater threat to medium bombers than the increased number of flak guns has been the improvement in accuracy of German gun crews, particularly those in the Brenner Pass area. This is due partly to improved equipment and technique, and partly to the continual training and practice gained by the crews in actual operations against Allied bombers. The need for distinctive measures against these guns became evident in the spring of 1944.

Anti-flak measures were first employed by the 57th Bombardment Wing on 16 June 1944, in an attack on a railroad viaduct on the Florence - Bologna railroad line. From that date on, some form of anti-flak defense has been used in almost all attacks on targets known to be defended by heavy gun positions.

The first of these measures was the dispensing of chaff by the planes of the leading element of the bombing formation. It soon became evident, however, that better results could be obtained by the use of a separate chaff dispensing element flying ahead of the main formation.

This new method was first used on 22 June 1944, and in addition to chaff, each plane in this element carried 12 x 120 lb. fragmentation bomb clusters, which were dropped on gun positions surrounding the target. The employment of chaff and fragmentation bombs for anti-flak purposes continued until 15 September 1944.

On this date the 340th Bombardment Group of the Wing inaugurated the use of 100 lb. M-47 white phosphorus bombs against gun positions. The results were very satisfactory, and this became a standard anti-flak measure for this Group, and was soon adopted by the 310th Bombardment Group.

During this period, the third Group of the Wing — the 321st — had been conducting experiments with the M-17 500 lb. incendiary cluster, but later it also changed to the white phosphorus bomb, making uniform the type of anti-flak bomb used by all units of the 57th Bombardment Wing.

A GOOD EXAMPLE OF HEAVY, INTENSE AND ACCURATE FLAK

The size of these explosives, bursting at approximately 10,000 feet, indicates that this is heavy flak. The accuracy and intensity are easily pictured.

As a counter action to enemy anti-aircraft fire of this type, the 57th Bombardment Wing is employing the measures described in this article.

DESCRIPTION

Chaff

Chaff, sometimes called "Window", is made of aluminum foil. C.H.A. 3-3 is the type now being used by the 57th Bombardment Wing. Each individual strip of chaff is 10 3/16" long and .045" wide. The packages of chaff shown in the photograph each contain 2,000 of these strips and are 11" long, 3" wide and 1/2" thick.

The purpose of this chaff is to produce a reflecting surface similar to that of an aeroplane, causing false impressions on the enemy radar equipment.

White Phosphorus Bomb

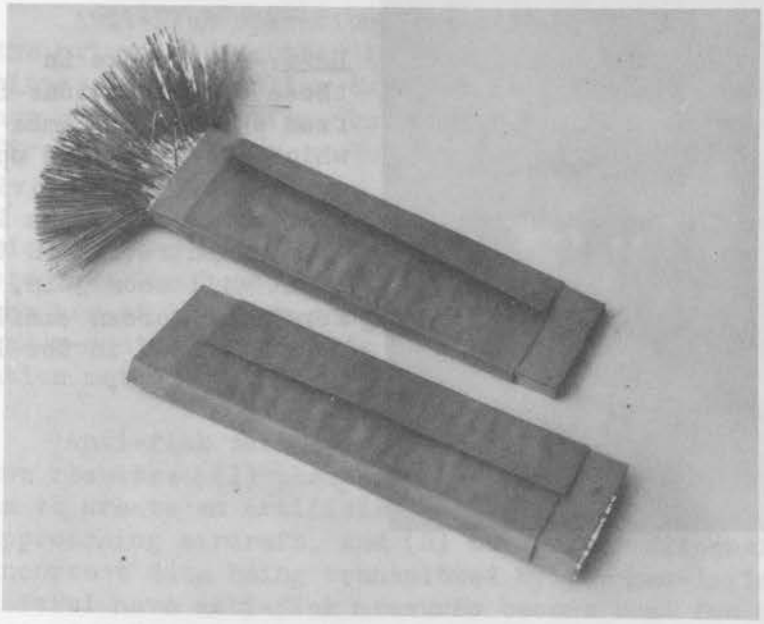
The M-47 100 lb. white phosphorus bomb is primarily a screening agent, and has a very high Total Obscuring Power of 3,500. The Total Obscuring Power is the co-efficient used in determining the value of war smokes, and is expressed in the number of square feet of cross-sectional area completely obscured by one pound of the smoke agent.

In addition to its primary purpose as a screening agent, white phosphorus smoke also causes a painful and lasting body burn.

It is known that the psychological effect is often sufficient to make gunners abandon their positions, a theory which has been borne out by the interrogation of prisoners of war.

The M-47 100 lb. white phosphorus bomb is used with the M-126 fuze, when it is desired that the bomb should burst on impact. A burster, which is used in chemical bombs in place of the booster, will detonate the bomb; the type of burster ordinarily used is the M-4. This burster will cause the burning phosphorus to scatter over an area of about 4,000 sq. yds., creating a thick screening smoke, which will last from 10 to 15 minutes in a wind of up to 12 m.p.h. A recent development in the tactical use of the white phosphorus bomb for anti-flak units has been the employment of the M-111 flare fuze, adapted for the M-47 100 lb. white phosphorus bomb. This is a mechanical time fuze, which is set to explode from 300 to 500 feet above the gun positions. This greatly increases the effectiveness of the bomb for visual screening, and also widens the spread of the phosphorus particles. At the bursting point, the smoke quickly develops into a screen, which, if aimed accurately, shields the bombing formations from the gun positions, or, if dropped over the gun crews, will rain burning particles down on them. The lasting quality is not as great as the ground burst, however, and the usual practice at present is to carry a mixed load with approximately one-third of the bombs set for air burst and two-thirds set for impact burst.

The usual load is 12 x 100 lb. bombs per plane. Recently, however, 22 bombs in double cluster have been successfully carried in an anti-flak aircraft.



Left: The lower package of chaff is in the form in which it will be dispensed. The force of the air striking it upon release will open the wrapper.

Right: The left interior of the bomb-bay of a B-25 carrying 12 x M-47 100 lb. white phosphorus bombs.

Left: The smoke in these concentrations is from phosphorus bombs which have exploded upon impact. The individual columns of smoke in the concentration on the right will soon join, forming a screen similar to that shown in the left of the picture.

Right: These phosphorus bombs were set to explode from 300 to 500 feet above the ground. The particles of these bombs have a greater spread than the type shown above. The smoke screen, however, will not last as long.

TACTICS

Anti-flak operations resemble artillery counter-battery fire, in that the principal function is to silence, or render inaccurate, enemy gun positions. To accomplish this, it is not necessary to destroy the batteries, nor cause casualties, but merely to create a condition that will make accurate fire improbable.

It is known that the German 88 mm and 105 mm A.A. guns are fired both visually and by radar, or by a combination of both. In the last method, which produces the best results, azimuth and elevation data is determined through the use of the Kommandogerat, while the altitude is determined by radar. Total radar-controlled fire is believed to be only 25% as effective as this combination method.

Anti-flak tactics, when correctly applied, should accomplish the following two results: (1) phosphorus bombs will fall close enough to gun positions so as to create an artificial cloud, which will prevent visual tracking of the approaching aircraft, and (2) the proper dispensing of chaff will result in incorrect data being transmitted by the gun-laying radar equipment. So successful have anti-flak measures become that few missions are now planned against defended targets which do not contemplate the employment of anti-flak tactics as an integral part of the mission. The final solution is a thorough analysis of the enemy defenses, in order to properly plan the correct bombing of the gun positions, and the dispensing of chaff to the best advantage.

The method, selection of approach, number of aircraft and bombing procedure in anti-flak bombing varies according to the situation prevailing at each individual target. There is no fixed relationship between either the number of aircraft in the bombing formation and the number of anti-flak aircraft, or between the number of guns and number of anti-flak aircraft. The number, location, and area of the separate batteries are the determining factors, and, in general, an element of three aircraft is assigned to each separate battery that is within effective range of the bombing formation on its bomb run.

Generally, whenever only one battery is involved, it is possible to have a single element combine both phosphorus and chaff functions. But if two or more batteries require neutralization, two or more elements will be used to carry phosphorus bombs. The element whose course is closest to, or upwind from, the axis of attack of the main bomber formation also dispenses chaff. Occasionally, a separate chaff element is required, as when, for example, the guns are downwind and strong winds prevail at right angles to the bomb run, which will make necessary a separate chaff element flying upwind of the course.

The placing of the anti-flak element, or elements, in the formation, and other attack procedure, varies with the individual mission and the different Bombardment Groups of the Wing. Whenever there is only one anti-flak element it is usually attached as a third element in the lead box of six aircraft. When more than one element is used they normally make up their own box and

fly as the rear box, or boxes, in the first flight. The anti-flak elements return to their normal position in the formation as soon after completing their dispensing and bombing as is possible.

Whenever enemy fighter activity is anticipated, at least six aircraft constitute the anti-flak formation for defensive reasons, regardless of the number of gun batteries.

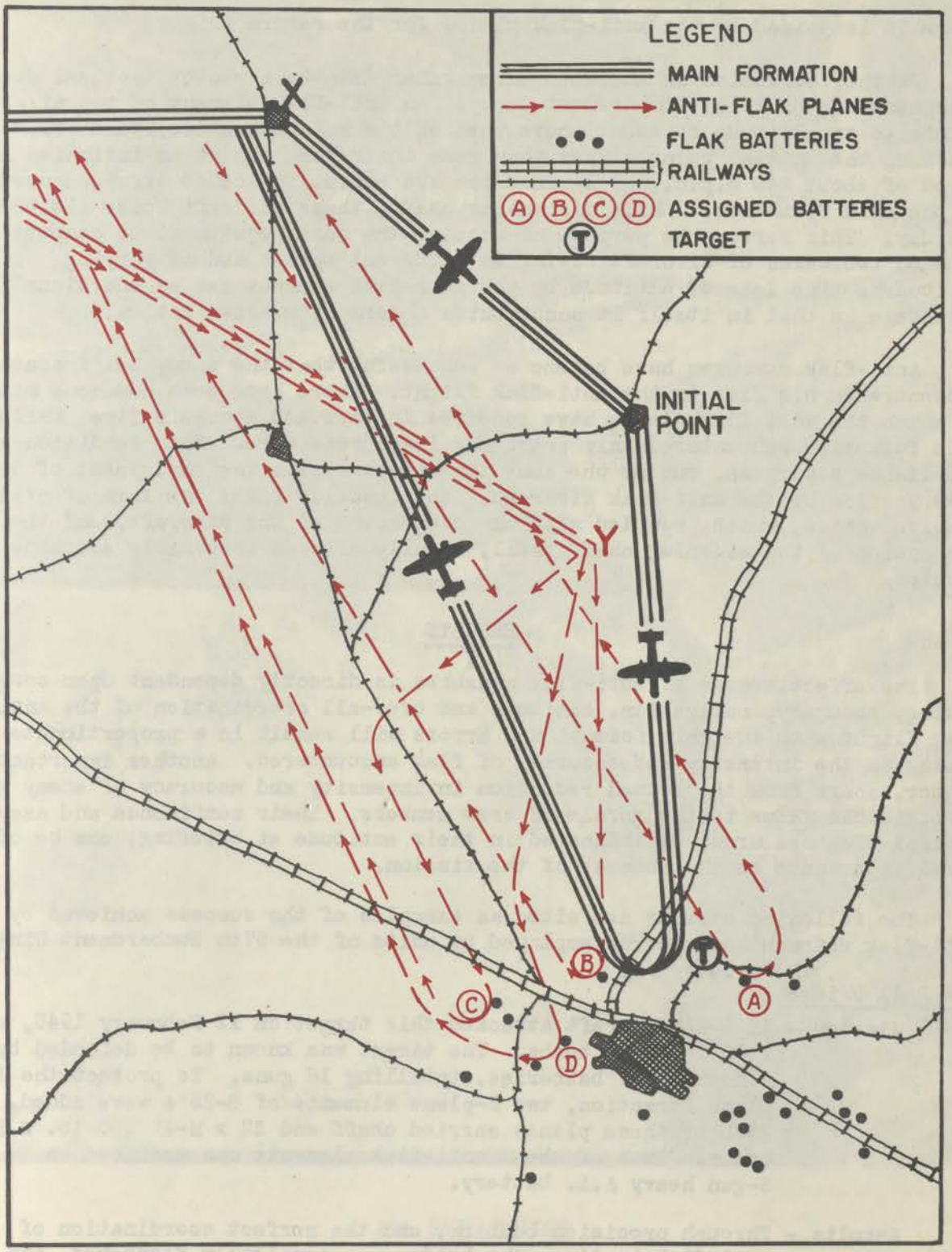
Since the timing of the chaff-dispensing and phosphorus bombing must be perfect in order to achieve the maximum effectiveness, the approach of the anti-flak formation, and its distance ahead of the bombers, must be carefully planned and efficiently executed.

When the pinpoint location of the gun position is accurately known, as is usually the case, the anti-flak flight is sent in about 6 miles ahead of the main formation. This amounts to a time spacing of about two minutes at the indicated air speed now used by the B-25 aircraft. This distance was selected because the German 88 mm gun normally opens fire on our aircraft at a range of about 5.3 miles. This spacing is usually gained at the initial point by cutting off a corner of the formation's briefed course. When that is not possible, a dog-leg is arbitrarily established on the route, just prior to the initial point, in such a manner that the anti-flak planes can continue on course and be sure that the required spacing has been gained. This latter method accomplishes another purpose in that it gives the bombardier an opportunity to work a double drift problem in the close vicinity of the target. When more than one anti-flak element is employed, the elements separate at the initial point and proceed directly to their assigned individual targets, joining up as soon as possible after the breakaway. When the timing is correctly executed, the phosphorus bombs will burst just before the main formation comes within range of the guns.

The anti-flak elements always fly a very loose formation on their approach to the target. Chaff dispensing is begun when the anti-flak planes are 8 miles from the gun-defended area. At this point the main bombing formation is 14 miles from the gun-defended area, and 20 miles from the actual gun positions. Chaff is also often dispensed by the lead element of the first flight of the main formation, and by the rear element of each flight, in order to cover succeeding flights.

In the diagram on the opposite page these tactics are pictured.

The four known gun positions are shown as points A, B, C, and D, each of which is attacked by one element of anti-flak planes. Three of these elements have left the main formation shortly before reaching point "X", while the fourth element has left the formation at point "X". By turning inside the route of the main formation, the desired spacing has been gained. Upon reaching point "Y", the anti-flak plane elements have split up and attacked their assigned targets. The main formation has gone to the initial point, turned on to the bomb run, bombed its target, broken away and turned back to point "X",


LEGEND
MAIN FORMATION
ANTI-FLAK PLANES
FLAK BATTERIES
RAILWAYS
A B C D ASSIGNED BATTERIES
T TARGET
INITIAL POINT
Y
A
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where it is joined by the anti-flak planes for the return flight.

Further confusion is added to enemy radar data by a recent tactical development of the 321st Bombardment Group. An anti-flak element of two aircraft climbs to an altitude somewhat above that of the main formation, just prior to reaching the initial point. They then make their bomb run at an indicated airspeed of about 240 m.p.h., as against the 195 m.p.h. indicated airspeed used by the main formation. While dispensing chaff, these aircraft loose altitude rapidly. This serves the purpose of forcing the radar equipment to compute data on two waves of aircraft flying at different speeds and at varying altitudes. The loss of altitude by the anti-flak element has an additional advantage in that in itself it constitutes a form of evasive action.

Anti-flak measures have become so successful that the enemy has frequently concentrated his fire on the anti-flak flight. There have been numerous missions on which the anti-flak planes have received intense and accurate fire, while the main formation encountered only scant and inaccurate fire. This condition accomplishes a purpose, but at the same time necessitates the employment of defensive tactics by the anti-flak aircraft. This usually takes the form of mild evasive action, which, coupled with the dispersion of the aircraft, and the protection of the widening chaff trail, usually affords reasonably adequate protection.

RESULTS

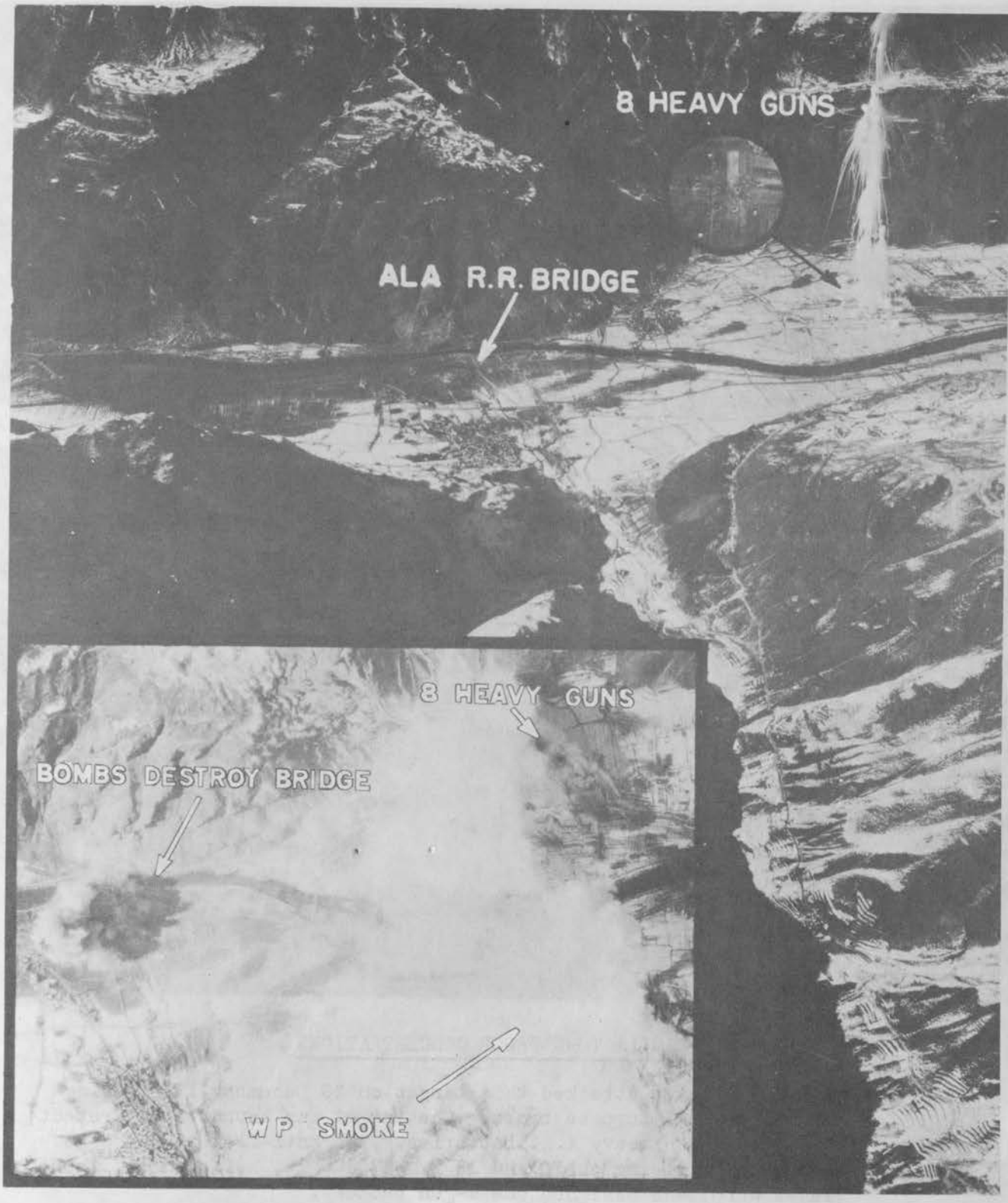
The effectiveness of anti-flak measures is directly dependent upon correct timing, accuracy, navigation, altitude and over-all coordination of the anti-flak flight with the main formation. Errors will result in a proportionate increase in the intensity and accuracy of flak encountered. Another important factor, apart from the actual reduction in intensity and accuracy of enemy gun fire, is the value to the morale of crew members. Their confidence and assurance in anti-flak measures, as indicated in their attitude at briefing, can be of vital importance to the success of the mission.

The following attacks are cited as examples of the success achieved by anti-flak defense measures as employed by units of the 57th Bombardment Wing:

Ala Rail Bridge

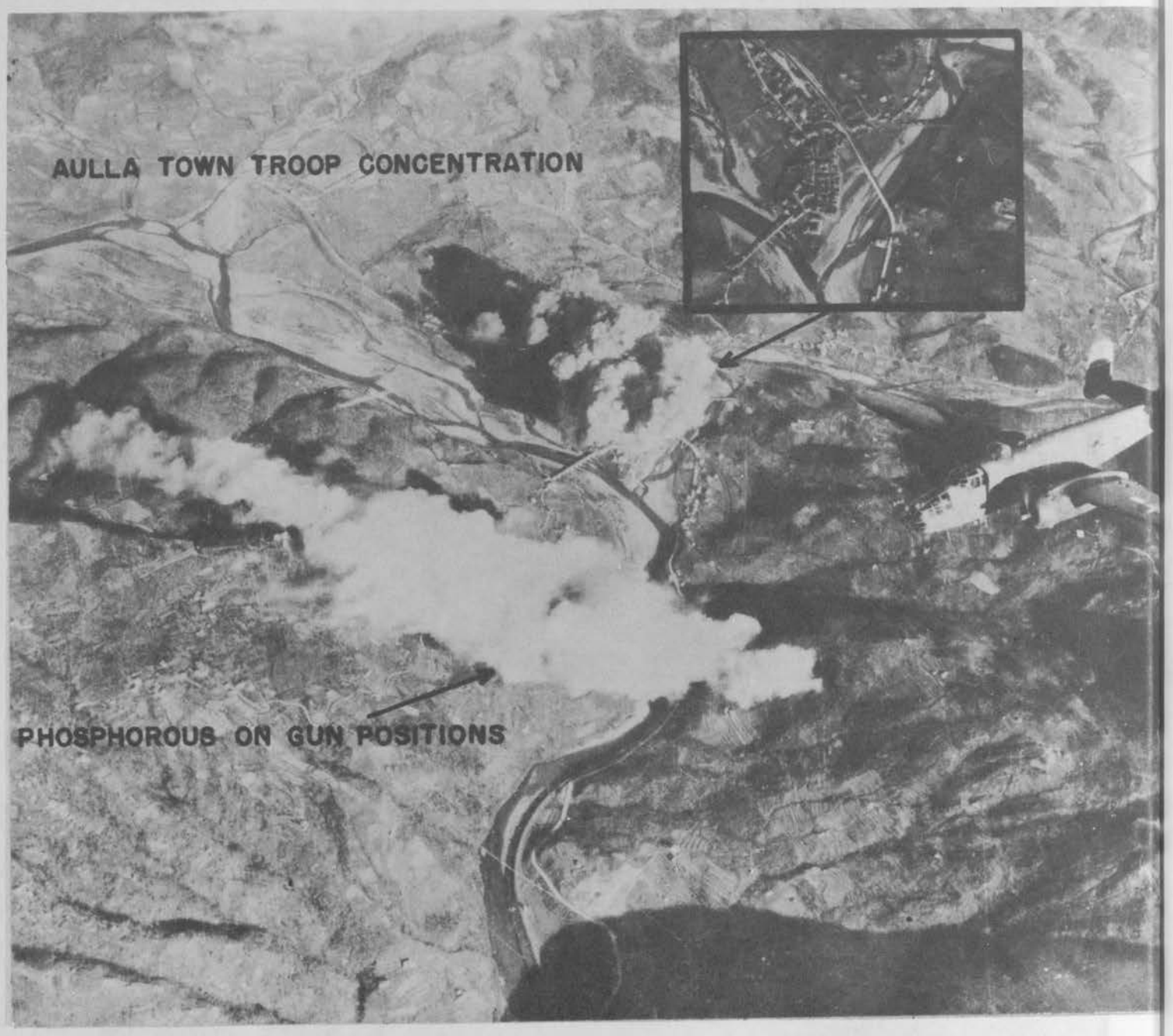
Mission - 18 B-25 aircraft attacked this target on 12 February 1945, using 1000 lb. G.P. bombs. The target was known to be defended by 2 heavy A.A. batteries, totalling 16 guns. To protect the 18 plane formation, two 3-plane elements of B-25's were added. Each of these planes carried chaff and 22 x M-47 100 lb. W.P. bombs. Each of these anti-flak elements was assigned an 8-gun heavy A.A. battery.

Results - Through precision bombing, and the perfect coordination of anti-flak tactics, the bridge was completely destroyed, and only scant, inaccurate flak was encountered. Not a single aircraft was damaged.



ALA RAIL BRIDGE

The target is shown before and during attack. This is an example of perfectly aimed phosphorus bombs. As shown in the smaller insert, the northern heavy gun battery suffered direct hits from "air burst" phosphorus bombs. The southern battery, not shown in this photo, received similar treatment.

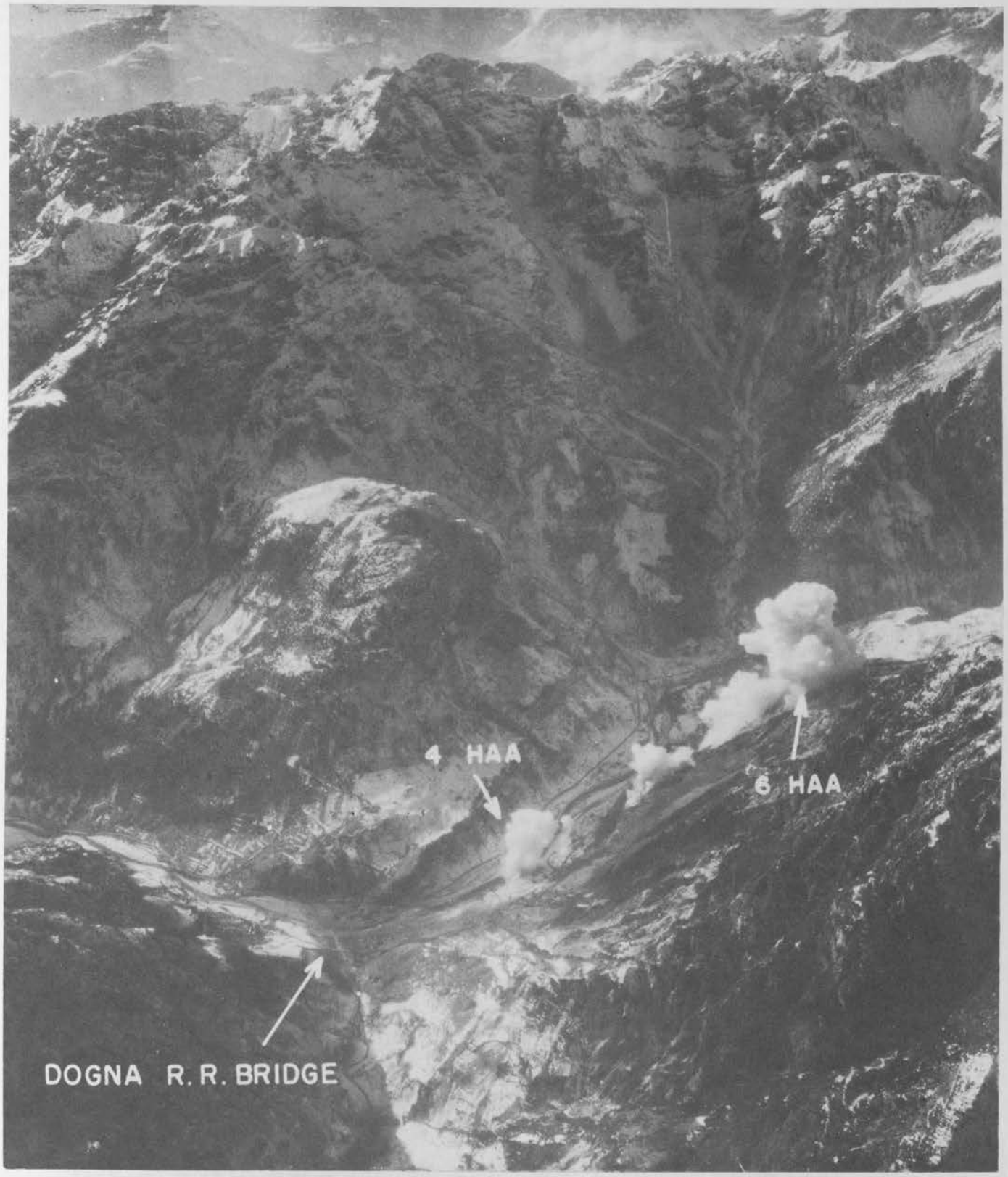


AULLA TOWN TROOP CONCENTRATIONS

Mission - 24 B-25 aircraft attacked this target on 26 December 1944, using 500 lb. general purpose bombs. The target was known to be protected by two 4-gun heavy A.A. batteries. Two anti-flak planes were used, each carrying chaff and 12 x M-47 100 lb. W.P. bombs. These planes were each assigned one 4-gun battery.

Results - The above photograph shows an excellent concentration of bombs covering the entire target. Ground sources stated that over 300 Italian Alpine and German troops were killed.

The A.A. positions were so thoroughly covered with phosphorus that only scant, inaccurate flak was encountered. Not one of our aircraft was damaged.



DOGNA RAIL BRIDGE

This bridge was attacked on 17 February 1945 by 18 B-25's, accompanied by 5 B-25 anti-flak planes. The A.A. batteries, whose positions are indicated in the picture were so well covered by phosphorus bombs that only scant inaccurate flak was encountered.

II. TACTICS AND TECHNIQUE EMPLOYED BY LIGHT BOMBERS OF XXII T.A.C. IN NIGHT INTRUDER WORK

By the middle of 1944, the urgent need for round-the-clock air attacks aimed at the destruction and interdiction of enemy supply columns was felt in the Italian Theater. By that time, Operation "STRANGLE" had demonstrated the feasibility and practicability of isolating an entire front by the tactical employment of air power against the enemy's lines of communication. This operation consisted of a two-month all out effort by day against rail and road bridges, highway choke points, marshalling yards, previously established stock piles and ammunition dumps, in addition to the destruction of road and rail transport when observed. The brilliant break-through by our ground forces from Cassino and Anzio, against an enemy whose supply reserves were so depleted that only initial resistance was encountered, was convincing proof of the success achieved by Operation "STRANGLE". However, one fact was clearly established — the enemy by moving entirely at night was able to meet his daily supply requirements and to maneuver his troops in the forward areas. As one general put it, "We had eight short stops and no third baseman". The task of "holding down third base" fell to the 47th Bombardment Group, equipped with A-20 type aircraft.

Operating Procedure

Before going into the operating procedure and attack techniques employed in night intruder work, it may be well to point out at the outset that, since the 47th Bombardment Group is the first American intruder unit to go into operation, the present tactics employed are formulative and subject to constant revision.

The operating area is divided into zones, each of which is roughly 50 miles square. Whenever possible, each zone is bounded by easily recognizable features, such as large rivers, mountain ranges, large cities and coastline. The A-20's take off at 10 minute intervals, with the first aircraft arriving in enemy territory just at dark, and the last one returning across the bombline just at dawn. (Obviously the interval between take-off varies with the season, since there are 14 hours of darkness during December as contrasted with an 8 hour night in June.) Each plane is assigned either a special target or a zone in which to reconnoiter. Approximately 75% of the nightly effort consists of armed reconnaissance within the zones, the primary objective of which is the destruction of road and rail traffic. Special targets include the Po River crossings, bridges and airdromes, as well as radar-controlled attacks in the Bologna Area in conjunction with the modified SCR 584 equipment.

The squadrons are briefed in their respective areas, using the daily Operations Order published by Group Headquarters. This contains all take-off and landing times, routes, altitudes and all zone or special target assignments. In addition, any special instructions pertaining to a given nights' operations are issued in this order.

A SQUADRON BRIEFING

Weather briefing must be very thorough. In addition to the regular forecast, a single plane performs an afternoon reconnaissance of the entire target area, reporting by radio the exact conditions encountered every 15 minutes. After the flying begins at night, a continuous and accurate weather picture is obtained at the interrogation. Alternate airdromes are a very important consideration. The present four-point arrangement is ideal with Borgo (Corsica) to the west, Ancona to the east, Pisa to the north and Tarquinia to the south. Each crew is instructed prior to take-off which alternate to use if the base should become weathered-in.

Interrogations are held at Group Headquarters so that later sorties may be diverted onto a target, should an especially lucrative one be reported. If the assigned zone is found to be weathered-in, a crew may enter an adjacent zone for a period not to exceed 15 minutes. If the weather is generally bad, or if a pilot is unable to locate a target in his assigned zone, he will climb back to the radar station rendezvous point and request a target from the SCR 584 set.

Bombloads, Fuzings and Bombsight

Aircraft assigned to zones carry 10 x 260 lb. fragmentation bombs with instantaneous fuzings. This bomb has been found to be extremely effective when used against M/T.

Night attacks on airdromes are normally of a harassing nature, and for this reason 500 lb. butterfly bombs are employed. The individual 4 lb. bombs have a mixed fuzing, and one-third of these are anti-disturbance bombs or booby-traps. This type of bomb is also used against repair units known to be working on a specific bridge, destroyed or damaged as a result of the day effort.

On all other special targets, including radar installations, 500 lb. G.P. bombs are used with fuzings that range from instantaneous up to 72 hour delay, depending upon the effect desired.

The British bombsight Mark-IX-E is now used exclusively. The Norden sight proved unsatisfactory due to its small field of vision at low altitudes; furthermore, distortion of lights was also encountered through the optical instrument. Since the Mark-IX-E was designed primarily for night use, it is working out very satisfactorily.

AN ARMORER PULLING THE BOMB SAFETY PINS JUST BEFORE TAKE-OFF

Tactics

In discussing tactics, it must be pointed out that moon phase and cloud conditions determine the attack techniques. Assuming in all cases that the weather is CAVU, the moon period for the first quarter to the last quarter will be discussed first.

During this period navigation is accomplished by map reading and the aircraft is pinpointed at all times. As soon as the assigned zone is reached, the pilot lets down to altitudes of from 5,000 feet to the deck, depending upon his experience in night work, and a search for M/T or rail movement begins. Since the enemy moves in blackout during this period, it is necessary to fly as low as possible in order to locate targets. Conversely during the black periods, the enemy must use lights, and it is possible to spot these convoys at altitudes of 8,000 to 10,000 feet.

When a suitable target is located, the pilot and bombardier set up their bomb-run directly into the moon, so that the target is always illuminated by the "moon path" along the ground. A very long, straight and level bomb-run is used. The number of bombs dropped on a single run, as well as their spacing, depends upon the size and disposition of the target. In attacking special targets during the moon period, the same general procedure is used, except that since these targets are generally well defended, the attack is made by using a shorter bomb-run and more altitude.

Night strafing is very effective. This is done only during the moon period, and after all bombs have been released. Fixed nose guns must be depressed to the maximum; four degrees of depression is sufficient, however eight degrees has been found more desirable. The guns when in the depressed position allow the pilot to make a long, shallow, diving pass at the target, firing continuously. The direction of the strafing attacks are along the length of the target and, if possible, up-moon. At the completion of the pass, an abrupt turn away from the moon path is recommended for the following three reasons: (a) to avoid silhouet-

ting the aircraft between target and moon, (b) to allow the turret gunner to bear effectively on the target, thereby covering the breakaway, and (c) such a turn constitutes good evasive action, if the aircraft draws ground fire during the actual pass.

Night skip-bombing has been found to be the most certain means of destroying railway engines and rolling stock. Due to the bad depth perception, even on the brightest nights, however, this is extremely dangerous, and only the one or two top crews in the squadron are permitted to attempt it. For this type of attack, the aircraft is loaded with 4 x 500 lb. G.P. bombs with 8 to 11 second delay fuzing. Since a bombardier is unnecessary, the solid nose gun model plane is used. The pilot descends to a railway line known to be active, and cruises along or near the tracks until the tell-tale arching smoke column gives away the position of the train. He then moves well out to the side of the train and begins a shallow dive from approximately 300 feet directly at the engine. At point blank range, two bombs are released and the pilot pulls up and away. All guns are used to cover the approach and the break away. The result is most devastating, but again it should be emphasized that this type of attack is extremely dangerous.

During the two week period, throughout which there is no moon, the tactics employed are much simpler. The crews navigate by time and distance to their zones at altitudes that will allow them to safely clear all terrain features enroute. It is for this period during the month that the zones are inclosed by readily recognizable landmarks. Once within the zone, the crew can roam about in search of a target and still remain oriented.

The German, when forced to use lights, generally uses them only on every fourth vehicle. This is an important factor, both in attacking and reporting the road movement. Railway movement is always blacked out, and therefore it is never located during the dark-of-the-moon period. No low-level attacks are made and no strafing is attempted during this period. All attacks within the zones are made on lights from altitudes of 5,000 feet and up. Against special targets, precise navigation is required, and only the most experienced crews are given these assignments during the dark-of-the-moon period.

Use of Sector Control Stations

The Sector Controllers are real friends of the night intruders. All night long they are on hand to pass or receive target information, to help crews locate themselves and to advise them in cases of bad weather or steer them onto alternates. The Sector Controller at Florence even acts as traffic regulator in filtering aircraft through to the SCR 584 for radar runs. It is of primary importance that new crews are fully indoctrinated with the functioning of these Sector Controllers, not only for personal safety reasons, but also for offensive purposes.

To illustrate one of the many examples of the close coordination between the Sector Control Station and a night intruder aircraft, the following may be

considered a typical case — "Muffit 100", assigned to the Brenner Zone, locates a convoy of 200 plus M/T moving south out of Verona. He immediately calls one of the Sector Controllers, giving him the approximate number of M/T sighted, their location and their direction of movement. The Sector Controller passes the exact message by telephone to Group Operations, and the operations officer on duty immediately rings the control tower officer, instructing him to "air brief" the next four aircraft taking off on this target. As a result, 30 minutes after the convoy is first located, it is under continuous attack by fresh planes.

ONE OF THE AIDS IN LOCATING THE HOME FIELD

The Sector Controller informs the night intruder when enemy fighters are in the area. In a few cases, pilots have been startled into immediate action when suddenly informed by the Controller that an enemy fighter was on his tail.

Enemy Opposition

Up to the present, the only enemy night fighters encountered in Northern Italy have been single engine type aircraft, which presumably are not equipped with radar. Although these fighters have made several attacks, no damage has been reported to date, and in every case the fighter was easily shaken off by evasive action.

Enemy flak at night, both light and heavy, is generally inaccurate. Over well defended targets at altitudes of under 5,000 feet, damage and possibly some losses have been sustained. (The term "possibly" is used, since the cause of the failure of crews to return is seldom definitely ascertained.) This is due, however, to the quantity of flak rather than to its quality. On the other hand, at altitudes of above 8,000 feet flak is rarely encountered by single sorties. An attack in strength on key points, regardless of altitude, will normally bring a violent reaction from the enemy flak batteries. Since the ground defenses depend upon barrage, rather than tracking fire for effectiveness, the best evasive action is to calmly but quickly leave the area of the barrage. In any case, do not attempt to climb out — always hit the throttles and drop the nose.

In summing up the hazards encountered in night intruder operations in general, it has been found by experience in the 47th Bombardment Group that if a pilot studies the weather situation and conscientiously applies himself to instrument flying practice, he can pretty well ignore enemy action, and he will probably live to be an old and experienced night intruder.

Close coordination between the night intruder aircraft and the Sector Control Station is of great importance.

Information obtained by interrogations of returning crews will, in many cases, determine the targets for later missions.

III. TACTICAL TRIALS OF ME-109G: COMPARISONS MADE WITH SPITFIRE IX AND MUSTANG III

In accordance with instructions received from the Air Ministry, Central Fighter Establishment has made a series of tactical comparison trials of the ME-109G vs. the Spitfire IX and the Mustang III.

General Description of the ME-109G

The ME-109G is a small, low wing, single seater, single engined, short range fighter, with fittings under the fuselage to enable it to carry a jettisonable fuel tank. A 250 H.G. bomb may be carried under the fuselage in place of the fuel tank. The undercarriage is fully retractable and the tail wheel partially retractable. This aircraft has a re-designed fin and rudder which is approximately 1½ square feet larger in area than those fitted to earlier Marks.

The power unit is a DB.605A-1 engine which develops approximately 1550 h.p. at 22,000 feet.

The armament consists of 2 x 13 m.m. M.G's mounted above the engine, 1 x M.G. 151/20 m.m. cannon firing through the airscrew hub, and 2 x M.G. 151/20 m.m. cannon in under-wing gondolas.

The all-up weight of the aircraft with full war load, including pilot, is approximately 7,488 lbs., and the wing loading is 43.6 lbs/sq.ft.

SIDE VIEW of the ME-109G

Tactical Comparison with Spitfire IX

Speeds: The ME-109 was compared with a Spitfire IX for speed and all-round maneuverability at heights up to 25,000 feet. Up to 16,000 feet the Spitfire holds a slight advantage when using 18 lbs. boost, from 16,000 to 20,000 feet the ME-109 gains slightly in speed, and at heights above 20,000 feet the Spitfire again leads in speed to the extent of approximately 7 m.p.h. When 25 lbs. boost is employed in the Spitfire it is about 25 m.p.h. faster at heights below 15,000 feet and 7 m.p.h. faster at heights in excess of 15,000 feet.

Climb: The climb of the Spitfire is superior to that of the ME-109 at all heights. It has a particularly marked advantage below 13,000 feet using 18 lbs. boost, and this is more pronounced when using 25 lbs. boost. When both aircraft are pulled up into a climb from a dive, the performance is almost identical, but when climbing speed is reached the Spitfire slowly pulls away.

Dive: Comparative dives between the two aircraft have shown that the ME-109 can leave the Spitfire without any difficulty.

Turning Circle: The maneuverability of the Spitfire IX in this respect is greatly superior to that of the ME-109, and it easily out-turns the ME-109 in either direction at all speeds.

Rate of Roll: Here again the Spitfire has a marked advantage at all speeds.

Range and Endurance: Refer to table.

Tactical Comparison with Mustang III

Speeds: The comparison between the Mustang and the ME-109 showed that the Mustang possesses the advantage in speed even at 16,000 feet (the rated altitude of the ME-109). At this height the Mustang was approximately 30 m.p.h. faster than the ME-109 and at 30,000 feet the advantage in speed possessed by the Mustang increases to 50 m.p.h.

Climb: The ME-109 has a slightly better rate of climb up to 20,000 feet, but between 20,000 and 25,000 feet the Mustang has a very slight advantage. When the aircraft are dived and subsequently climbed there is very little to choose between their performance.

Dive: The comparison of the respective merits of the two aircraft in dives proved that the ME-109 is steadily out-dived by the Mustang III, and as the dive is prolonged the Mustang gains appreciably.

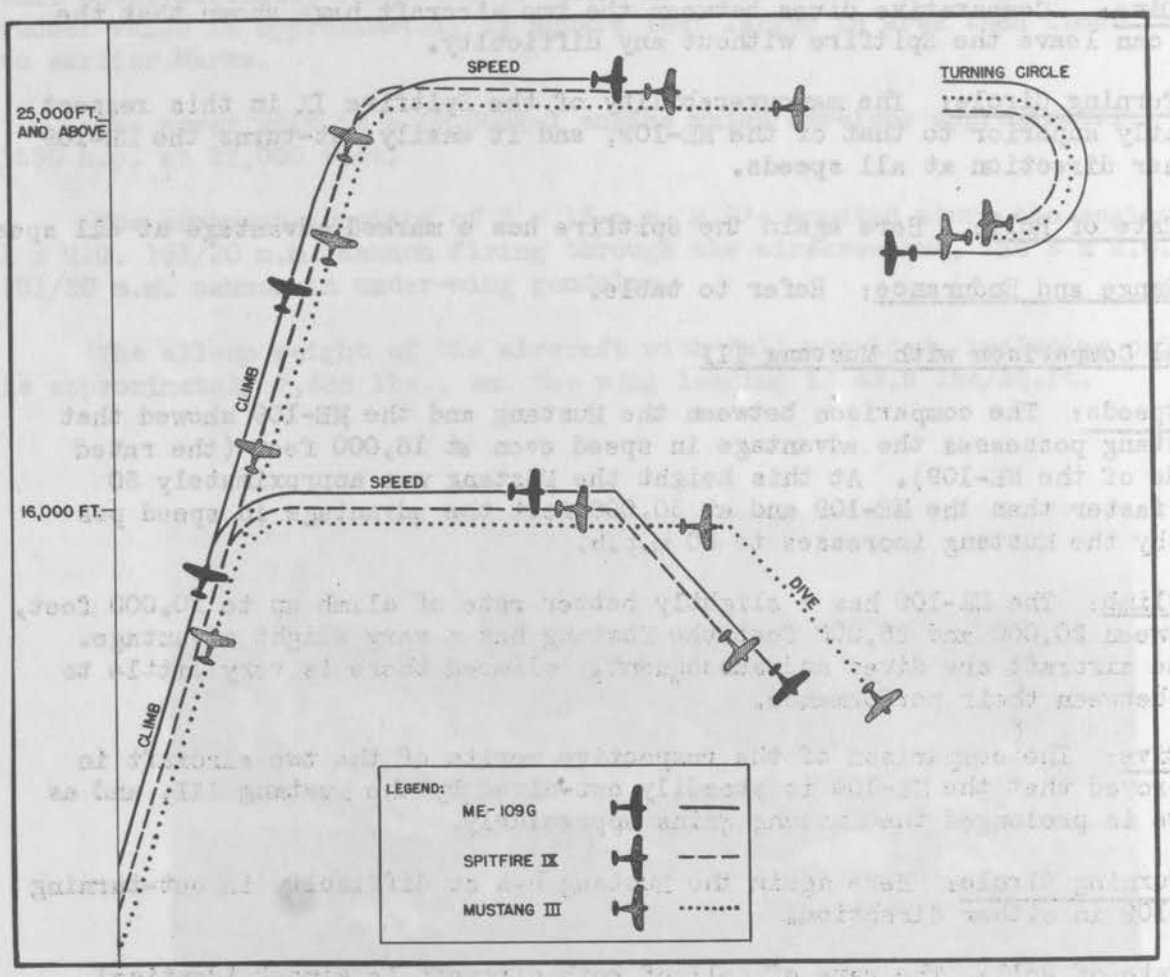
Turning Circle: Here again the Mustang has no difficulty in out-turning the ME-109 in either direction.

Rate of Roll: The rate of roll of both aircraft is almost identical.

Range and Endurance: In view of the fuel capacity of the Mustang III, the ME-109 is obviously at a great disadvantage as far as range and endurance are concerned.

RANGE and ENDURANCE TABLE

AIRCRAFT	Fast Cruising Miles	Fast Cruising Hours	Max. Range Miles	Max. Range Hours
ME-109G	450	1.4	615	3.1
With 66 gal.drop tank.	795	2.6	1045	5.3
SPITFIRE IX	365	1.1	420	1.6
With 90 gal.drop tank.	785	2.5	900	3.8
MUSTANG III	690	1.8	890	3.6
With 2x62½ gal. tanks.	1180	3.5	1445	7.1



The above chart shows the relative basic maneuver performances of the three planes. This has not been drawn to scale, but is offered merely as a visual means of comparison.

Conclusion

From the foregoing, it is apparent that the performance of the ME-109G is inferior in all respects, with these exceptions:

a. It has a greater dive acceleration than the Spitfire IX.

b. It has a slight advantage in speed over the Spitfire IX, when flying at altitudes of from 15,000 to 20,000 feet.

c. It has a slight advantage over the Mustang III in rate of climb, when flying below 20,000 feet.

IV. PHOTOGRAPHIC WORK BY LIGHT AIRCRAFT

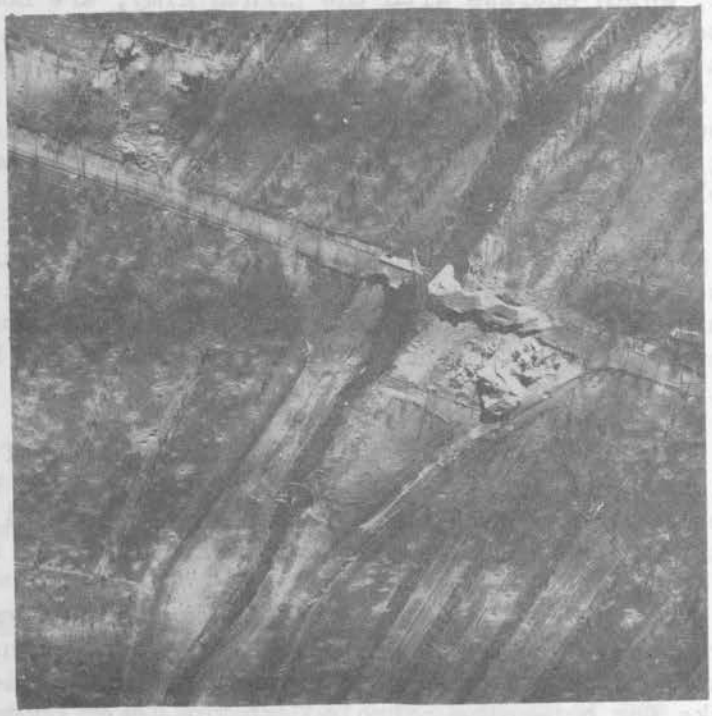
Air Observation Post (A.O.P.) Squadrons under the command of Desert Air Force have recently been equipped to do photographic work. (See previous article in December issue of the Monthly Bulletin, p.80). These A.O.P. Squadrons, which operate with the Eighth Army, are now being used to take large-scale photographs of enemy forward positions, and much useful data has been obtained as a result. The aircraft employed are Austers Mark III and Mark IV, which are equipped with hand-operated cameras, either F.24, F.20 or F.8. The Squadron is equipped with a mobile dark room constructed on a 3-ton chassis, with processing and printing facilities. Three enlisted men have been trained to do the developing and printing of the photographs.

On each sortie approximately twenty exposures are normally taken, and these can be processed, printed and dispatched to the originator of the demand within about five hours after the request is received. In this way, Division Commands, Corps Commands and forward troops may have quick reports on enemy positions immediately prior to assault.

It has been found that these light aircraft can operate in weather conditions, such as low cloud or light rain, where heavier aircraft are unable to take off. They normally fly at an altitude of 1,500 to 2,000 feet, and the pictures may be either obliques, near-verticals or verticals.

On the following page two photographs of enemy forward positions are reproduced. The upper photograph is a typical near-vertical shot, which has been found of great value in providing information of enemy positions and tracks for out-going patrols. In the lower photograph is a typical oblique view; these provide valuable data for the Royal Engineers, so that the right type of stores and equipment for repairing bridges may be brought up during an advance.

Left: Typical near-vertical photograph of enemy forward defense locations, showing defense installations and tracks.



Right: Oblique shot, showing bridge in enemy forward defense locations. Photographed for the Royal Engineers.

V. TROOP CARRIER OPERATIONS IN THE BALKANS DURING 1944

FOREWORD

The general picture of Troop Carrier operations in the Balkans during 1944 was presented in the January issue of this Bulletin (p.75). Describing the situation in that region, and the resultant need for resupply and evacuation operations, the introductory article covered the manner in which these requirements were met, and the accomplishments of 51st Troop Carrier Wing units, in particular those of the 60th Troop Carrier Group.

Fully 80% of all missions flown by the 51st Troop Carrier Wing in support of Balkan resistance movements were supply drops, more often than not combined with nickelling over areas enroute to or from the principal target. It is that type of mission that is discussed in this issue, to be followed next month by an article on landing missions behind enemy lines, and the important role played by radio aids in this field of Troop Carrier activity.

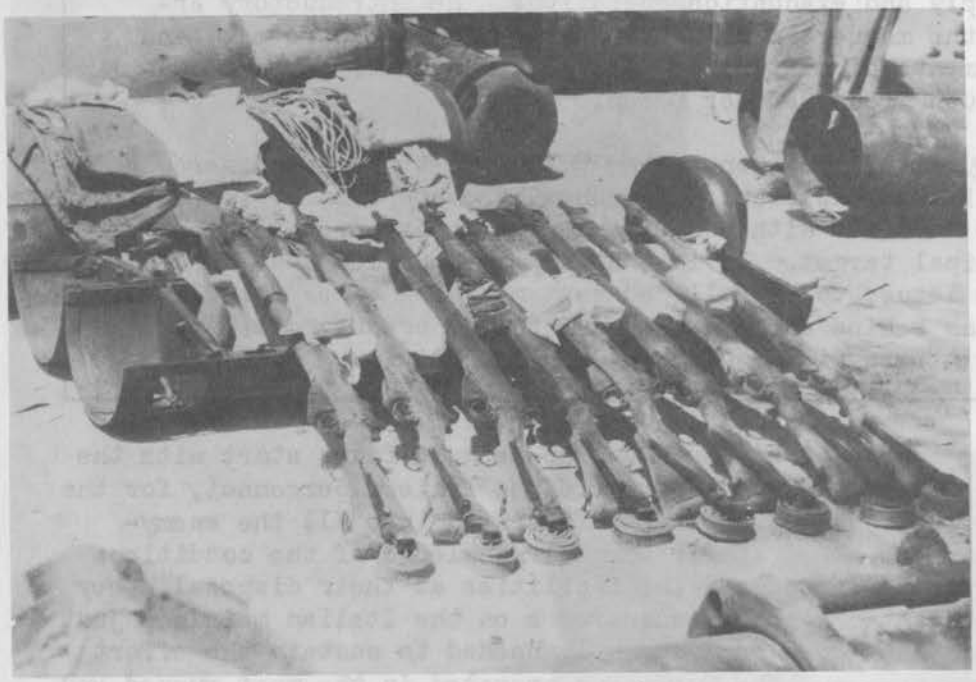
In tracing the course of any supply drop we must first start with the request originating in the field. Highly trained liaison personnel, for the most part British, were constantly being infiltrated into all the enemy-occupied Balkan countries. With their special knowledge of the conditions prevailing in a particular area, and the facilities at their disposal, they could quickly make known to Allied Headquarters on the Italian mainland just what supplies or personnel were most urgently needed to sustain the effort against the occupying forces. The Partisans operated in the most rugged and barren regions of the Balkan peninsula, they lacked adequate transport or lines of communication to more productive areas, and were constantly under enemy pressure. Hence their very survival depended upon the prompt satisfaction of their needs. As these needs became known, and as the results of each drop were observed, radio messages were sent back by Force 399, "A" Force, No.1, Special Force., I.S.L.D. and O.S.S. teams to their respective rear headquarters, whose representative submitted their requests to the Balkan Air Force, which, in turn, established a daily list of priorities. This was turned over to the 344 Wing (RAF), under whose operational control the Troop Carrier Units were working. A daily meeting of Operations, Intelligence, Meteorology and Loading Officers was held, to set up each night's operations, limited only by two constant factors — weather and available aircraft. The number of aircraft dispatched to a given target was dependent on the following variable factors:

a. The relative tactical importance of each target, balanced against the number of aircraft available for the night's operations.

b. The weight of the stores desired at each target.

c. The number of hours of darkness available for operations (missions were flown by unarmed and unescorted C-47's).

Once the over-all picture of the night's operations was determined, a critique was held by Squadron Operations Officers before the missions were assigned to particular crews and aircraft. The assignments depended on the peculiarities of the target and the experience level of the pilot.



Left: Arms, ammunition and clothing, packed in containers which will form external load.

Packing and Loading

In the meantime the central Packing Station at Brindisi was busy preparing loads for the night's work. Partisan workers, supervised by Allied officers, occupied a number of warehouses, in which material was stored according to type. The main categories being arms, ammunition, food and clothing. A large stock of "standard packs" was kept on hand, as experience showed a constant demand for certain stores. Since there was always a backlog of requests from the field, any special items, such as radio equipment, explosives, medical supplies and lubricants, could be packed and stored separately, to await the first sortie to the particular area involved.

Each morning the Air Loads Section received the program for the night's operations, established a maximum load for every aircraft, and dispatched by

truck a checker with each load list to collect from the various warehouses the containers required. Regular stops were made at the Parachute Shed, and at the Post Office, for even in the lonely mountain regions of Albania, Allied personnel must receive their mail. Finally, a crew of loaders was picked up and all was in readiness for the containers to be transferred to the proper aircraft, where final checks were made by the Air Loads supervisor and the crew chief of the individual plane.

Briefing

The very nature of these operations required that briefing be done in two distinct stages. Over a period of months the nightly average of sorties made by the 60th Troop Carrier Group was around thirty, and missions were sometimes flown to more than twenty separate targets in one night.

Individual crews were briefed on the route and target of each drop, and it was essential that each pilot be as fully briefed, and as confident, as the flight leaders in other types of air operations. With this in mind, Group Intelligence Officers developed a "Target Information Sheet", prepared daily for each pilot and distributed through Squadron Intelligence. The pilot's name, aircraft number, code name of mission and load number were given. The target was located by geographical and grid coordinates, described in relation to the nearest settlement, and pinpointed on a 1:100,000 scale map. Information was included concerning fire signals, dummy signals, letters of the day, from air to ground, and ground to air at the target, estimated time of return to base, nickelling target, existing radio facilities at the target, and miscellaneous information concerning target obstructions, elevations, recommended direction of run, flak en route, and so forth. On occasion, pilots were assigned an alternate target,when weather appeared doubtful and similar requests had been made by two teams in the field.

Ample opportunity was afforded each pilot to digest this detailed information, and discuss it with his Intelligence Officer, before the final, general briefing of all crews took place at Group Headquarters. Held shortly before the first scheduled take-off, this meeting provided pilots with last minute weather forecasts, operational instructions as to take-off, tactics, etc., a brief presentation of the latest intelligence as it might effect crews coming into contact with the enemy, with friendly convoys, or with friendly bomber and fighter formations operating in the same areas, and finally, a word by the Air Liaison Officer representing the packing unit providing any necessary technical information concerning packing, method of dispatching and recommended dropping heights for the various components of the loads. Escape and evasion procedure was reviewed and amended periodically at these briefings by Intelligence Officers, who had occasion to see the fruits of their efforts.

On many nights principal targets would be visited by from five to eight aircraft, and in some instances as many as fifteen aircraft were dropping on the same pinpoint. In such cases their take-off times, and the times over target, had to be spaced thirty minutes apart (twenty minutes when more planes were involved), so that not too many aircraft would be circling in the same

limited target area at the same time. No accidents were ever caused by lack of air discipline, but this had to be rigidly maintained as regards traffic patterns and altitudes going in and out of the DZ (Dropping Zone) area, especially on non-moon nights with no lights being used.

Limits of Operating Range

In some cases C-47's dropped their supplies as far as 445 miles from the base, but 300 miles was considered the maximum range for normal missions. The extra time allowance had to be made for accurate location of the target in the bad flying conditions so prevalent most of the year in the rugged Balkan terrain. In many instances, pilots made several run-ins from a coastal check point (the most reliable at night, when the break between land and water can usually be discerned) to insure that the cause for not locating the DZ was not navigational error. Often it was necessary to "stooge" around the target area for a full hour, waiting for fires to be lighted in answer to the plane's signal. Not infrequently, the ground forces were unable to respond within that time, or other conditions prevented a ready drop, and the "stooging" went on for an additional hour. The longest mission was 8½ hours, and the longest uninterrupted stretch of instrument flying was 5 hours.

Route and Approach

The route followed was seldom a direct one from base to target, but was planned to avoid flak-defended areas on the Balkan mainland, and among the enemy-held islands off the Dalmatian coast. Diversions were made to confuse the enemy radar systems, which had good coverage in this area. Landfall was made at points along the Balkan coast and at altitudes exceeding 6,000 feet, dead reckoning being used from there on in to the DZ. As explained in the previous article on these operations, most of the drop zones were located in low-lying areas of the most mountainous regions, where they were as inaccessable to the enemy as possible. It was up to the pilot to clear the peaks in order to reach his target, then, after identification, circle to lose altitude until he was 600 feet or less above the DZ. In advance of the run-in, an air to ground letter of the day was flashed in Morse code by Aldis lamp or flashlight, and upon seeing it the ground team was to signal the proper letter in answer, and light a prescribed number of fires representing a third letter of the alphabet. Each one of these signals was changed daily. Frequently the fires were lit as soon as the aircraft was heard approaching, and they served as a useful navigational aid. Occasionally, fires already lighted were hastily extinguished, indicating that enemy forces were dangerously near and that the supplies dropped might fall into the wrong hands.

It was rare indeed that Allied material was dropped to the enemy, for even if by superior force he had succeeded in chasing the Partisans from the DZ after the fires were lighted, no loads would be dropped unless the correct letter was flashed from ground to air as well. A captured document, published many months ago in the M.A.A.F. Weekly Intelligence Summary, clearly proved that our recognition system was well known to Nazi forces in the Balkans, but

A "V" of nine fires was one of the means of target identification on this particular mission. Typical of many resupply DZ's, this one is well hidden among the surrounding Yugoslav hills, inaccessible to the enemy.

the knowledge did them little good when they could not turn it to their own advantage.

Target Run and Drop

If all conditions for target identification were fulfilled, the pilot would let down as described for the first run-in. Usually several runs over the DZ were required to put the entire load in a restricted area, since all

packs carried inside the plane had to be unloaded by hand. Some drops were free, others by parachute, depending on the nature of the stores. On moonlight nights free drops were made from as low as 100 feet, parachute drops from 250 feet or more, depending on the weight of the bundles or containers. The heavy external containers were always jettisoned first, in order to lighten the weight of the plane, making it more maneuverable. Winds could almost always be expected, and the pilot could not make free drops and parachute drops from the same point and still put all his load in the target area. Correction in position was made on each succeeding run, taking into account wind drift and the increasingly lighter weight of the bundles (heavier ones always went out first). This maneuvering was not easy in frequently turbulent air, at such a low flying speed. Seldom could level runs be made over the targets, sunken as they were among the hills that offered protection to the guerrilas but were a constant hazard to the C-47's.

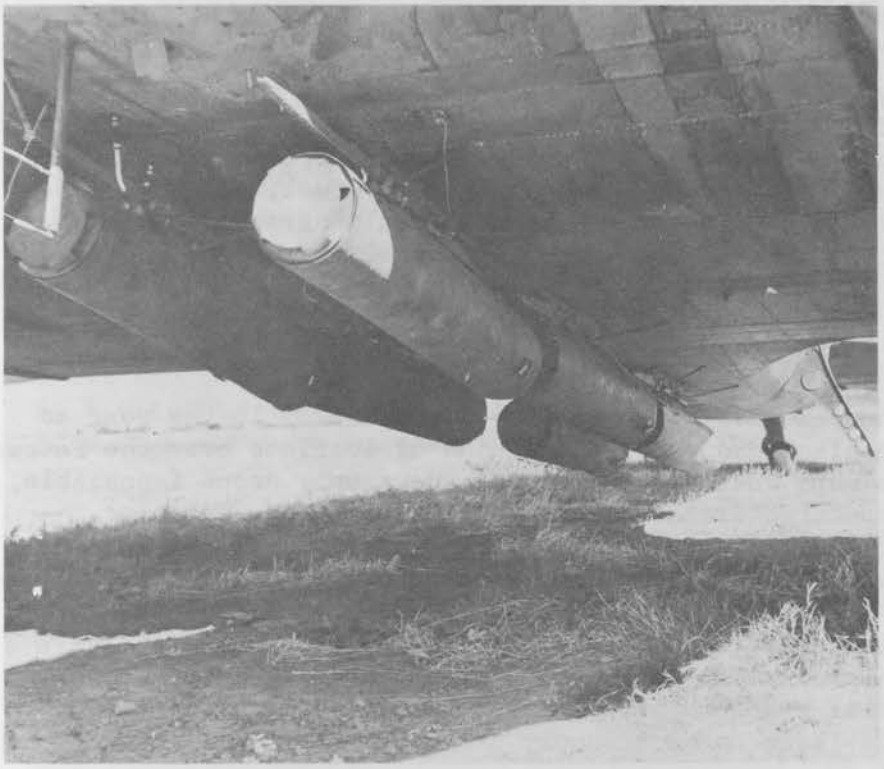
Almost all the responsibility for the accuracy of the drop fell upon the pilot, whose signals determined the actions of the unloading crew. Alerted during the approach to the target, the crew chief would station himself, with the Yugoslav dispatcher and the radio operator, near the open rear door. A red light, flashed at this station by the pilot, gave a final alert five seconds before the signal to drop. This was a green light, also flashed by the pilot. At that the crew chief released, in braces of two, the containers slung under the fuselage, and during each succeeding run the packages constituting the internal load were pushed out, until a bell signal halted dropping for that particular run. It was the goal of each pilot to avoid dispersal of the load as much as possible, and some ground crews even went so far as to report fires extinguished by the bundles, so accurate did the drops become. One hapless ELAS officer was killed by a direct hit as he stood among the fires he had helped to light.

Lessons Learned

Occasional difficulty was experienced at first, in throwing long, lightweight bundles out the cargo door. These were swept up by the slip-stream and caught in a balance on the left horizontal stabilizer. No aircraft are known to have been lost on this account, but several came perilously close to disaster before the bundle could be shaken loose. Later on this danger was practically eliminated by better packing, and by tying light bundles to heavier ones. The back section of the cargo door had to be reinforced by fixing a cable between its front edge and the floor, a measure made necessary when longer packages and bundles were found to push against this section as they entered the slip-stream.

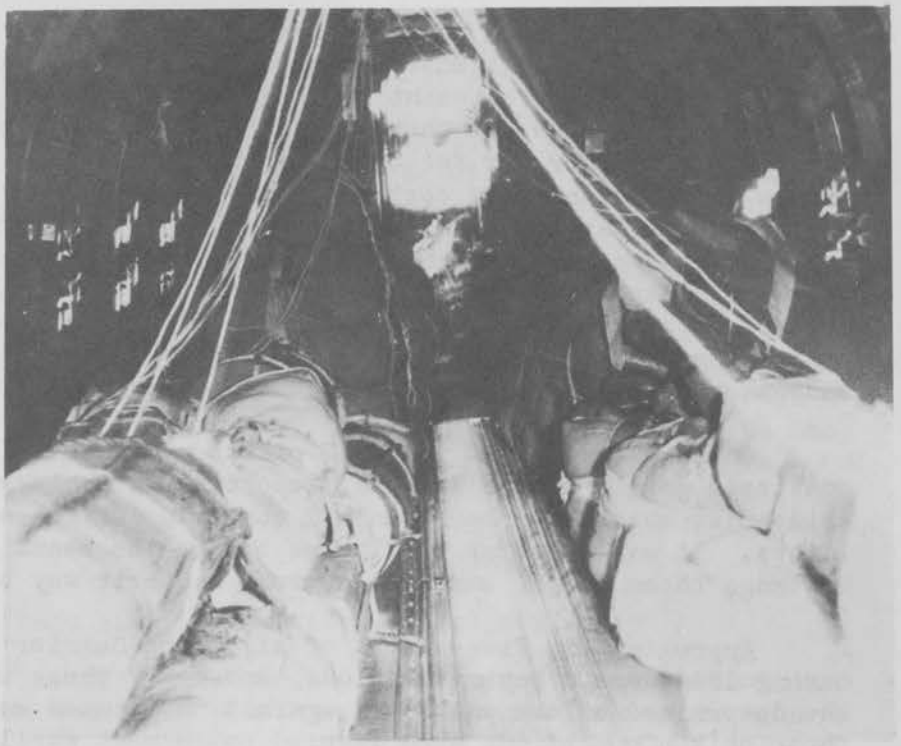
"Joes"

Highly important was the human cargo often dropped by Troop Carrier over Partisan territory. Personnel who were thus infiltrated into enemy-occupied countries came to be known as "Joes", and many hundreds of these parachuted from our C-47's. Most of them were trained British or American personnel, some



Left: Six containers are electrically released, usually in braces of two, during the first run over the target. This leaves for succeeding runs the lighter packages and bundles forming the internal load, which are pushed out by the crew.

Right: Bundles and packages make up internal load. Packages are dropped by parachute, and seen here are the parachute static lines attached before take-off. Bundles are merely thrown out the cargo door.



of them women, whose main job was to organize new dropping zones or landing strips, and to distribute supplies once they had been delivered. Equipped with radio, they acted as the liaison between their respective rear bases and the isolated fighting forces in the Balkans, ordering stores, arms and ammunition for delivery where they were most needed. "Joes", anywhere from one to fifteen at a time, had to be dropped from an average height of 700 feet, and at a speed as low as 110 m.p.h. It was agreed that no personnel would parachute when the wind was blowing more than 25 m.p.h., and ground personnel flashed the necessary warnings to the aircraft.

Nickelling

Missions were assigned exclusively to nickelling as early in the year as 22 February 1944, when one plane dropped 4,500 pounds of leaflets over the Patras area of Greece. On nights when weather conditions made supply drops impossible, nickelling over heavily populated areas was accomplished by dead reckoning. However, the great bulk of the 429 tons of nickels dropped by C-47's over the Balkans during the year was made up of small parcels thrown out on the return from a resupply mission. Nickelling targets, being in more thickly settled areas, were apt to be in better defended areas, and it was safer to drop the important load first, then proceed to the second target, usually not far off the return route. No special problems were presented by nickelling operations, which became a routine side-issue to most supply drops.

Return to Base

Upon their return to base, pilots and navigators were interrogated by their Squadron Intelligence Officers at the Group Interrogation Center. An Air Liaison Officer representing the packing unit was present during the questioning of each crew, so that he might inform the loads agency of results, and of requirements for the following night's operations, at the earliest possible time. In the event that certain important loads were known to have been dropped away from the target, details were transmitted to crews in the field, giving approximate location, height, heading and indicated air speed at the time of the dropping. Experience showed that the field, by calculation from such data, was able to recover loads blown several miles from the reception party. Information concerning ground reception, enemy activity in the DZ area, A.A. fire, weather and other pertinent subjects was carefully collected.

On an active night the C-47 pilots would have flown to a number of widely scattered points in the Balkans, reporting on their return the times and locations at which they had seen M/T convoys, for the enemy usually drove with lights. It was a matter of minutes before the Beaufighters, Spitfires or Mustangs based on the same field, were on their way to attack.

Approximately five-sixths of all Troop Carrier's missions over the Balkans during 1944 were dropping missions, and it is these that contributed the most to the determined effort put forth against the common enemy by our Partisan allies. These Balkan operations were carried out almost wholly under British supervision, and, as they developed, they became international in character, making use of Russian and Italian, as well as British and American, aircraft and personnel.

BOMB DAMAGE EVALUATION

TEST OF FRAGMENTATION BOMBS AGAINST A GERMAN 75 MM GUN

Because of the small size of the target area which they present, enemy gun positions are among the most difficult targets which units of M.A.T.A.F. are called upon to bomb. In the majority of cases, the enemy places his guns in revetments with heavy walls built of earth, stones or sandbags; and only in very rare instances will a gun be damaged as the result of a bomb-strike outside one of these revetments. Normally, in order to put a gun out of action, a hit has to be scored inside the revetment. Thus, the effective target area is limited to the inside of the emplacement, which for the average gun is an area only about 30 feet in diameter.

With small bombs, more individual packages of explosive can be carried in a plane than in the case of large bombs. For example, a P-47 type aircraft can carry 40 x 20 lb. fragmentation bombs, 12 x 90 lb. fragmentation bombs or 2 x 500 lb. G.P. bombs. Hence, under normal conditions, the use of light bombs greatly increases the likelihood of scoring a direct hit on a small target. The question arises, however, will the 20 lb. fragmentation bomb put a gun out of action if a direct hit inside the emplacement is scored, or if this is not the case, will the 90 lb. fragmentation bomb produce the effect desired?

A 20 lb. Fragmentation bomb, ready for detonation, 15 feet from the German 75 mm anti-tank gun.

In order to answer this question, the following test was carried out. A German 75 mm anti-tank gun was chosen as the object to be tested and 12 x 20 lb. fragmentation bombs and 6 x 90 lb. fragmentation bombs were statically detonated near the gun. The bombs were evenly distributed over an area corresponding in size to the inside of an average gun revetment. After each detonation, the extent of the damage caused was determined.

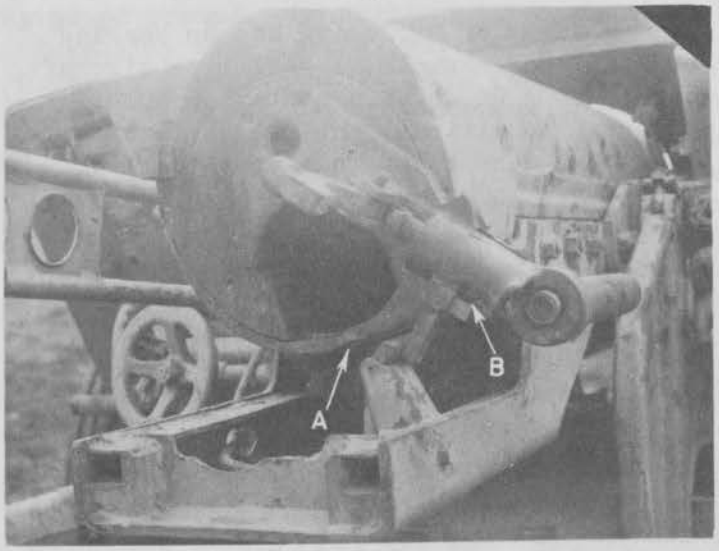
The results of this test may be summarized as follows:

a. A hit with a 20 lb. fragmentation bomb inside a gun emplacement in about one-half the cases will not prevent the gun from continuing to fire, and will only occasionally necessitate the removal of the gun to a repair shop.

b. A hit with a 90 lb. fragmentation bomb inside a gun emplacement will nearly always stop the gun from continued firing, and will in at least one-half the cases necessitate the removal of the gun to a repair shop.

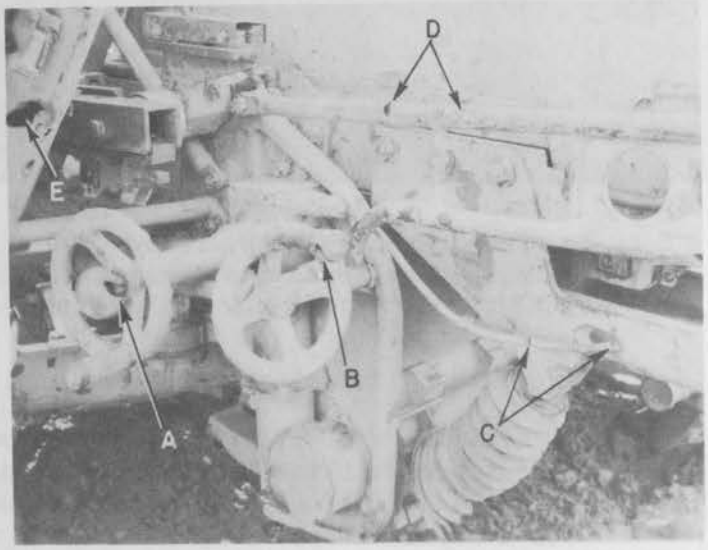
On the basis of these results, it may be concluded that the 90 lb. fragmentation bomb is the lightest bomb which, in the majority of instances, will put a gun out of operation if a direct hit within the emplacement is scored. Therefore, of the two types of light bombs, the 90 lb. fragmentation bomb is by far the best choice for attacks on gun positions.

EFFECTS OF 20 LB. FRAGMENTATION BOMBS

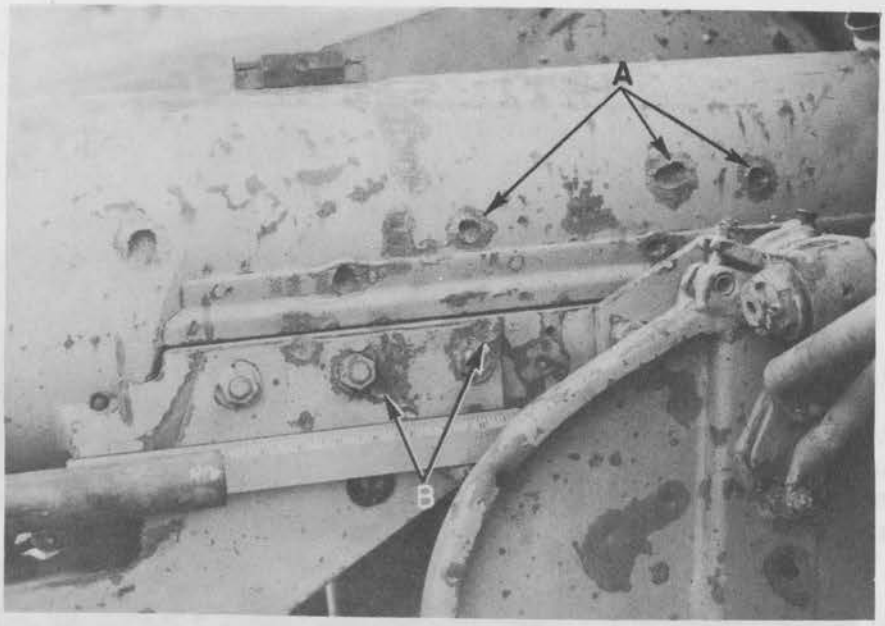


Left: Some parts of a gun are vulnerable even to lighter fragments. Hit "A" dented the breech ring and hit "B" locked the firing mechanism. Both hits, however, could easily be repaired by the gun crew.

Right: The 20 lb. Frag. bombs scored an appreciable number of hits on the trigger release "A", on the traversing handwheel "B", on the trigger cable "C", on the shoulder guard "D" and on the sight carrying box "E", but these hits were concluded to be more a nuisance than a real damage.



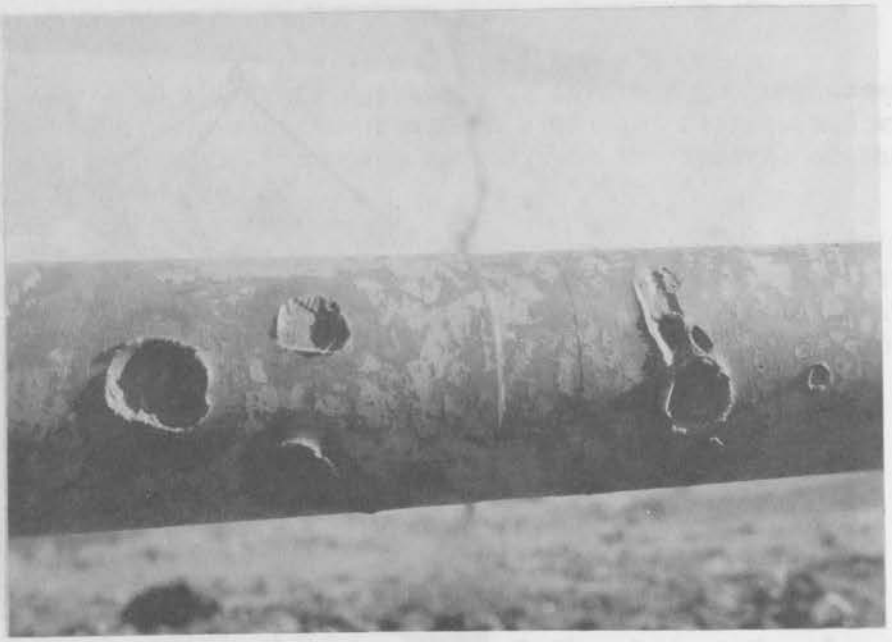
EFFECTS OF 20 LB. FRAGMENTATION BOMBS



Most of the major parts of a gun are too heavy to be damaged by 20 lb. Frag. bombs. Some hits on the tube "A" and on the cradle "B" produced only shallow dents, which did not prevent the gun from firing.

EFFECTS OF 90 LB. FRAGMENTATION BOMBS

Even the heaviest parts of this gun may be damaged by a 90 lb. Frag. bomb. A fragment "A" completely perforated the cradle and blocked the recoil.



Several hits on the tube by 90 lb. Frags. produced bulges in the bore. On firing, the shell would not be able to pass and the gun would blow up.

A detonation of a 90 lb. Frag. bomb at a distance of 7½ feet put the gun completely out of action.

SECURITY NOTES

SECURITY CLEARANCE OF CIVILIAN EMPLOYEES

With the advance of the Allied Armies into new territory the problems of security assume ever increasing importance. In most instances, the new locality has long been under enemy control, and the civilian population thoroughly indoctrinated with enemy ideology. We are well aware that the enemy Intelligence organizations have anticipated our coming and have taken pains to provide us with interesting moments by leaving a clandestine "Welcoming Committee" of espionage and sabotage agents. Fully aware of the situation, our own Counter Intelligence and Security organizations, operating through CIC and FSS, are continually endeavoring to ferret out individual agents and to disrupt their espionage network.

In the ranks of the civilian laborers, employed by our various units, enemy sympathizers can frequently be found. Even though they themselves may not be actively engaged on hostile missions, a deep-seated antagonism and hatred for the Allies may prompt them to render aid to enemy operatives, and to pass on to them information gleaned in the course of their work. Certain agents themselves will, if opportunity permits, make every effort to secure employment with Allied organizations. It is obvious, therefore, that the optimum degree of security can only be achieved when a well-planned and properly executed system of security clearance of civilian employees has been established.

It is recognized that slightly different procedures are employed by RAF and U. S. Army Air Force agencies in effecting security clearance, although the desired end is necessarily the same. It is believed, however, that the procedure hereinafter outlined, as prescribed for AAF units, will likewise be of interest to RAF organizations and personnel.

The Commanding Officer of each unit of the Twelfth Air Force is responsible for the security clearance of every civilian employed by his organization. Memorandum No. 46, issued by Headquarters, Army Air Forces, Mediterranean Theater of Operations, on 11 August 1944, expressly outlines the procedure to be followed by all concerned in the employment of civilians at all AAF headquarters, installations and air fields. It expressly requires that all civilians employed, and who have not already been investigated, will be checked forthwith to determine their qualifications with respect to security.

Not all employees require a full investigation by the Counter Intelligence Corps, however, for it is not intended that charwomen and ordinary laborers shall be included in the same category with others whose duties are of a more important nature. Regulations provide that the investigation

given such "mine-run" employees will consist of a record check with the local civilian or military police agencies. Request for this record check will be made by the Intelligence Officer of the employing unit.

It is obvious that a unit in the field will not possess as adequate means for security checking as will a headquarters situated in a large city. No matter how small the nearest town, it will always have a representative of the Carabinieri or Questura. Such Italian authorities can almost always furnish first-hand information on the subject's background, both politically and morally. Particularly is this true in Italy, where police authorities have long maintained records on everyone. Much can be gained by the maintenance of proper liaison with these Italian officials.

Other civilian employees will be engaged, however, for the performance of duties whereby the individual may have access to classified information. Further, it must be remembered that much classified information may be overheard and passed on by those having a knowledge of English, even though limited. Hotel employees and waiters in an officers' mess are frequently in excellent position to acquire military information. For such individuals the security clearance must go further than a mere record check, and special investigation by the CIC is required. Request for such investigation will be made by the Intelligence Officer of the employing unit to the nearest office of CIC.

After security clearance, each civilian employed should carry a proper pass containing full information and a complete description of the individual. The pass must set forth the conditions upon which it is issued, should be carried at all times, and should contain a direction that it must be surrendered immediately upon the termination of employment. For maximum effect passes should be printed in both English and the native tongue.

To properly fulfill the responsibility chargeable to his commander, the unit Intelligence Officer must establish a system whereby haphazard or "hit-and-miss" screening of civilians is eliminated. Full recourse must be had to the available security agencies, inasmuch as the shrewdest Intelligence Officer cannot determine whether an individual is a proper subject for employment simply by interrogating him (usually through an interpreter.)

It must never be forgotten that a single lapse of precaution, a single divergence from the established rules may result in the employment of a security hazard. More than once, persons who should never have been so employed have been discovered working for our units; in several cases confessed enemy agents have actually obtained employment with Allied commands. This could never have happened had an adequate security clearance program been in effect.

ESCAPE AND EVASION

STRATEGY

The fighter pilot, after completing a strafing pass, encountered intense 20 mm flak at 3,000 feet. The gas tank, supercharger and engine were hit, causing the engine to fail. The pilot, who discovered that his chute pack had caught in the armor plating, was unable to bail out and made a belly-landing in an open field. Although somewhat dazed from the crash, he removed himself from the plane and hurried to a farmhouse, where a friendly family gave him civilian clothes. Soon word was received that Fascists were approaching the area, and he was forced to make an immediate departure on a bicycle, which was provided by the farmer. The Fascists attempted to follow, but friendly civilians picked the pilot up in their automobile and drove him to a mountain hide-out. Here he met a British subject, who moved him to an Allied Mission. He was made comfortable and placed on a priority list to be taken across the lines.

During the next week, when an Italian guide was attempting to escort the airman and several other evaders through the lines, the party was attacked by Germans. The guide was killed and the balance of the group was captured and taken to a German Interrogation Center. Here the prisoners of war were held for six days, during which time they were intermittently interrogated in a courteous, friendly manner. In addition to general questions, which pertained to when and where shot down, type of aircraft, why subject airman was wearing civilian clothes, etc., the interrogator was primarily interested in obtaining knowledge of Partisan localities, and the names of the civilians who had assisted the Allied personnel. One trick was pulled by the interrogator, who was a very amiable, likeable sort of fellow. After many hours of friendly discussion, he said in an off-hand way, during a period of joviality, "I am coming to England after the war; how about a few addresses?" These were casually supplied by the English prisoners of war, and the pilot states that, because of the extreme friendliness of the interrogator, he, himself, would have given his home address had the German asked the same question with reference to America. During one of these conversations the German officer displayed reams of notes, which he stated were the result of other interrogations.

On the seventh day, the prisoners of war were placed in a truck, which headed north. After arriving at a large Italian city, they were turned over to the Gestapo, who began a very thorough search of the captives. The pilot immediately pleaded diarrhea, and during his visit to the latrine, he concealed his penknife and hacksaw in the room. These articles were retrieved the following morning on the same pretext, and on his trip back to the prison cell, he brought with him a three-foot strand of wire, which he had removed from the plumbing fixtures in the latrine. The group immediately began to plan their break-away and decided to make an attempt after the noon meal. If sufficient headway could be made, the Germans, because of their dread of Allied air ac-

tivity (which normally reaches its peak at approximately midday), probably would not attempt following them by motor vehicle. At 1400 hours the escape was successfully made. The American pilot slipped the wire through a crack in the door, and with the hooked end managed to pull back the bolt. With his saw blade, the second door was opened by removing the screws which fastened the lock to the door. He took with him six British ground force personnel, who followed him and the highest ranking British Officer in groups of two's at five minute intervals. Once outside the building, the party jumped into a mill stream, the high banks of which afforded a certain amount of concealment. With the exception of one British soldier, all of the members of the party were wearing civilian clothes, and although they were observed by many Italians, the enemy seemed completely unaware of the break-away.

The escapers headed north, forsaking the cover of the mountains to the south on the basis of the assumption that the enemy would search for them in that area first. After walking for one hour, they convened and then discovered that only five of the original group of seven had managed to escape successfully. A highway was crossed by going through an underpass to avoid being seen, and they moved south towards the mountains. That night an Italian family took them in, and on the following day two members of the same family guided them along the route to the Allied lines. While resting at one point, the party was attacked by fifteen Italians, but they screamed "Americanos," "Englais", and managed to emerge unscathed. The attackers proved to be Partigiani, who, after they were reasonably sure of the identity of the group, took them to a house and served them a banquet. Several days later, the escapers arrived at an Allied Mission, where preparations were made to cross the lines. Guides were procured and the party was safely conducted to Allied territory.

Comments by E & E Officer

a. This officer displayed exceptional courage, resourcefulness and brilliance in executing his escape plan. Each move was shrewdly thought out, after carefully weighing the capabilities of his German captors. His confidence in his own ability and his previous training were, of course, the deciding factors.

b. On his return from enemy territory, this pilot brought with him much valuable intelligence concerning the enemy installations in the area in which he had traveled. From the moment he touched ground in enemy territory until his return to the Allied lines, this officer changed his role from that of an airman to that of an intelligence agent. He is one of the very few Allied Air Force personnel who has been alert and observant. At every opportune moment he studied his surroundings, and thereby gained much useful knowledge concerning the enemy defenses in Northern Italy. The war did not end with the loss of his aircraft; at that moment this officer became an Allied Agent, who had landed safely in enemy territory.

PRISONER OF WAR CAMP AT MANTUA

This photo, taken by the 57th Bomb Wing during the attack on the Mantua/East Rail Bridge on 24 February 1945, discloses a new development by the enemy in marking Prisoner of War Camps. As seen from the air, this marking consists of the letters "POW" separated by light-colored bands, on the roofs of the five large buildings. The roofs of two of the small buildings are also marked "POW", and those of the other three are painted white.

A print showing this same camp covered with snow was attached to E & E Bulletin No. 54, dated 25 February 1945.

AIRCRAFT RECOGNITION

GERMAN TWIN ENGINE FIGHTER DEVELOPMENTS

The Luftwaffe has developed few notable additions in the twin engine field. Two new types, the HE-219 night fighter and the wooden FW-154 are covered in this report, as well as modifications of the old "standbys". The older "standbys" have been retained and improved in performance and fire-power. The recognition changes entailed in these improvements have been few, and in most cases affect the basic silhouettes only very slightly. As mentioned in the previous article on "German Single Engine Fighter Developments" in the January issue of this Bulletin, many different armament changes have been encountered — airborne rockets, mortars, large caliber cannon, upward and sideward firing remote control guns, and recoilless guns, to mention a few.

HEINKEL 219 — NIGHT FIGHTER.

This night fighter is basically of monocoque construction and is built in two sections, consisting of nose cockpit and main fuselage structure. The crew consists of two men — pilot and radio-observer — who sit back to back. They gain entrance through roof of cockpit.


HE-219

Latest reports give the engines as DB 603 in-line inverted "V" liquid, developing 1750 hp at sea-level on take-off. The engines are completely detachable. These engines give the HE-219 a maximum speed of approximately 435 mph. The landing speed is reportedly about 100 mph. To shorten the landing and take-off runs a dual-wheel tricycle landing gear is installed.

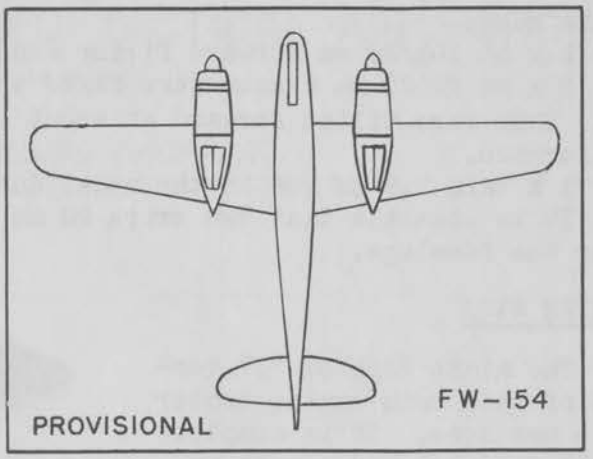
The HE-219 has a wing span of 60 feet 8 inches and a length of 51 feet. There is a report of an increased wing span version with apparently redesigned outerwing panels and pointed wing tips. The new span is slightly over 70 feet.

The armament varies on different versions, but on the A-0 it consists of:
4 x 20 mm cannon in detachable fairing under fuselage. Total of 1200 rnds.
20 or 30 mm mainplane guns with a total of 600 rnds.

Some recent sub-types reportedly carry two MK 108, 30 mm "astral" guns firing upward and forward. They are fired by the pilot and are fitted directly behind the cockpit, firing at an angle of 65° upward and forward. The pilot's protection consists of a bullet proof glass windscreen and armor plate.

FOCKE WULF 154

Earlier models of the "V" series were fitted with DB 603 or Jumo 211 engines, but it is claimed Jumo 213 engines with frontal radiators are to be used on the production model. Previous reports mentioned the possible installation of BMW 801 radial engines. The nacelles are fully under-slung, and about 5 feet from the fuselage. Three-bladed wooden propellors are mentioned.



The FW-154 "V" series is constructed of wood, except for light alloy control surfaces. Early models had a cockpit roof of plexiglass panels and a blacked-out nose. Latest models, it is reported, are equipped with a round plexiglass panel in the nose and a single, molded plexiglass sheet for the roof. The crew, consisting of two, sit side-by-side.

Combinations of 20 mm and 30 mm cannon have been reported as the armament, as well as rocket tubes under the wings. The tricycle landing gear retracts hydraulically, the wheels each doing a half-turn. Fuel is carried in one fuselage and two wing tanks.

The FW-154 has a span of between 52 and 54 feet, and a length of between 39 and 41 feet. The tail unit is described as resembling a scaled-up version of the FW-190. The maximum speed is believed in the neighborhood of 400 mph at 20,000 feet.

MESSERSCHMITT 210

An ME-210 equipped with a 50 mm cannon slung under the fuselage was recently captured and examined. This indicates the possible future use of this new airborne cannon.

MESSERSCHMITT 410

The only external difference between the ME-210 and 410 is an increase of about 8 inches in the length of the 410's engine nacelles.


ME-410

Although the fitting of 30 mm cannon in the ME-410 had been reported, it was not proved until a recent captured model was examined. The following arrangement was found:

2 x 30 mm cannon probably under the fuselage in fairing.
4 x 20 mm cannon in the nose.
1 x twin 7.9 mm gun in top rear of cockpit.

The lateral remote controlled barbettes were thought to be omitted. This omission had been encountered before in an A-3 photo version. The A-3 also had a 7.9 mm gun at the rear of the cockpit.

MESSERSCHMITT 110

Although forward-firing 30 mm cannon and almost vertically firing 20 mm cannon were previously found fitted in the ME-110, it is thought that the recently examined ME-110 G-4/R-3 night fighter is the heaviest armed ME-110. The armament of this aircraft consisted of the following:

2 x MG 151/20 mm forward firing cannon in the underside of the fuselage in the nose.

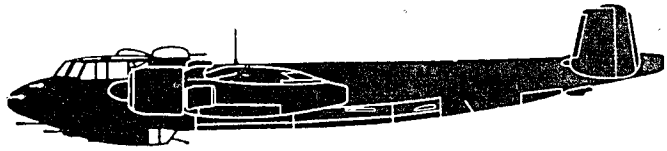
2 x MG 108/30 mm forward firing cannon on top of the nose.

2 x MG FF 20 mm cannon were fixed to the bulkhead behind the rear cockpit. They were tilted forward at about 15° from the vertical, firing upward and forward.

1 x twin 7.9 mm gun in the usual dorsal position firing rearward.

It is possible that two extra 20 mm cannon could be fixed in a fairing under the fuselage.

DORNIER 217J



Do 217J (2-BMW801)

The night fighter "J" version of this twin engine bomber has a new nose. It is completely blacked out and sweeps up to a point. (See illustration) The armament consists of:

4 x 20 mm cannon fixed in upper nose.

4 x 7.9 mm guns fixed in upper nose.

1 x 13 mm gun in turret top rear of cockpit.

1 x 13 mm (probable) bottom rear of cockpit.

Preliminary examination of another DO-217 night fighter revealed the most powerful upward-firing guns on any German aircraft. It consisted of:

6 x (probable) 37 mm cannon grouped in a circle in the fuselage just forward of the trailing edge of the wing. The barrels project about 1 inch above the fuselage.

4 x 7.9 mm guns in the nose.

2 x 7.9 mm guns in the wings, outboard of engines.

A turret was observed over leading edge of wing.

A parachute dive brake of heavy silk was fitted in the tail fuselage extension. This is the first time this type of tail brake has actually been encountered. For several years experiments had been carried out testing its effectiveness.

JUNKERS 88

The JU-88, although of pre-war design, still constitutes the bulk of the German Bomber Force. Several modifications have turned this twin-engine bomber into a fighter for both day and night duties. These modifications in brief are:

Sub-type - C-1 - Fighter developed from A-1 with Jumo 211 engines. 3 x 7.9 mm guns and 3 x 20 mm cannon in nose.

C-6 - Fighter developed from A-4, crew of three. Metal panelled nose. Increased armament and BMW 801 engines. Gun gondola is on starboard side.

C-7 - Report of possible rearward firing guns.

E - Unreliable report that this is a fighter with BMW 801 or 803 engines.

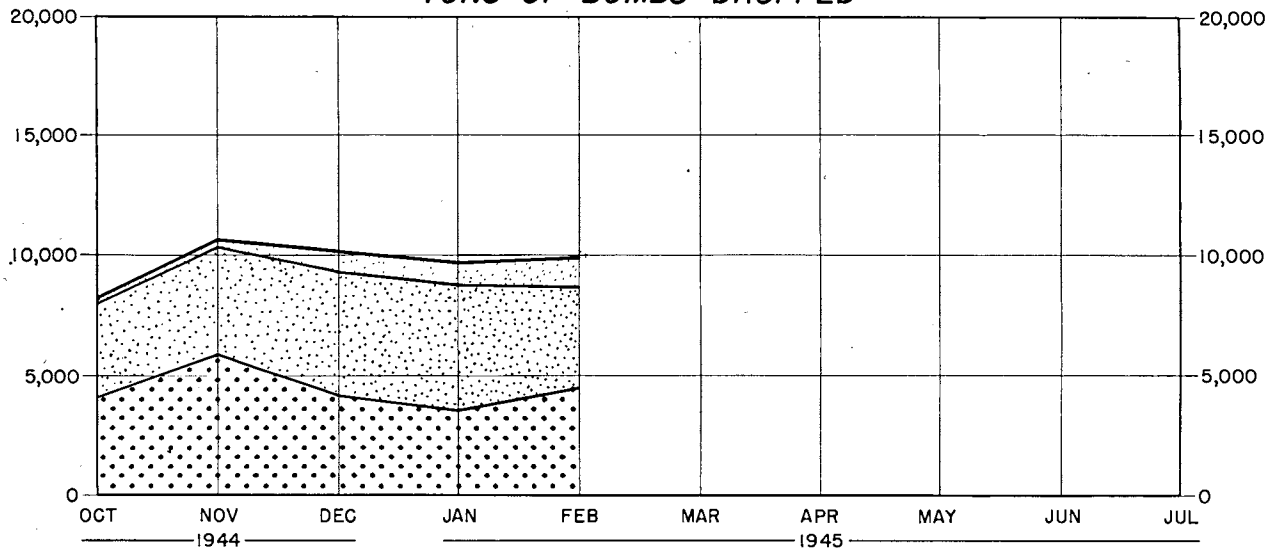
G - It is reported that this fighter is fitted with BMW engines. The armament is heavier than the C-1 and may include 30 mm cannon. Part of the armament is carried under the fuselage, a fairing set on the port side.

P - Little is known of this sub-type, but it is believed that the armament may include 75 or 88 mm cannon.

MEDITERRANEAN ALLIED TACTICAL AIR FORCE

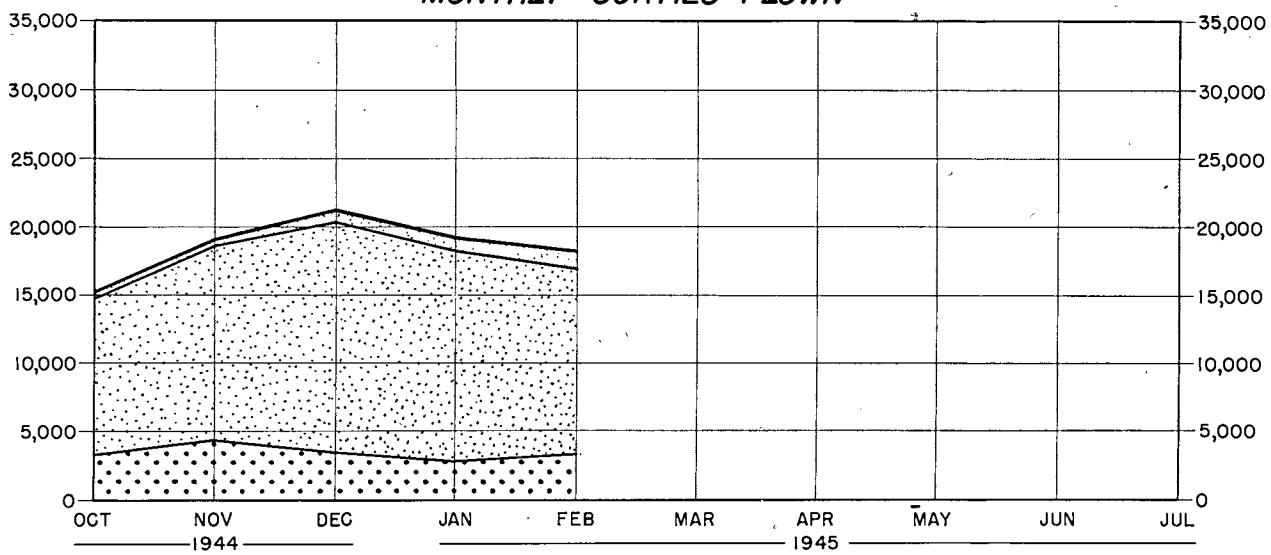
OCTOBER 1944 — JULY 1945

TONS OF BOMBS DROPPED



MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
MEDIUM & LIGHT BOMBERS	4,036	5,926	4,202	3,521	4,479					
FIGHTERS & FIGHTER-BOMBERS	3,981	4,381	5,186	5,231	4,177					
LIGHT BOMBERS (Night Operations)	205	364	717	993	1,341					
TOTAL	8,222	10,671	10,105	9,745	9,997					

MONTHLY SORTIES FLOWN



MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
MEDIUM & LIGHT BOMBERS	3,231	4,456	3,452	2,792	3,343					
FIGHTERS & FIGHTER-BOMBERS	11,647	14,284	16,921	15,443	13,605					
LIGHT BOMBERS (Night Operations)	234	387	783	892	1,269					
TOTAL	15,112	19,127	21,156	19,127	18,217					

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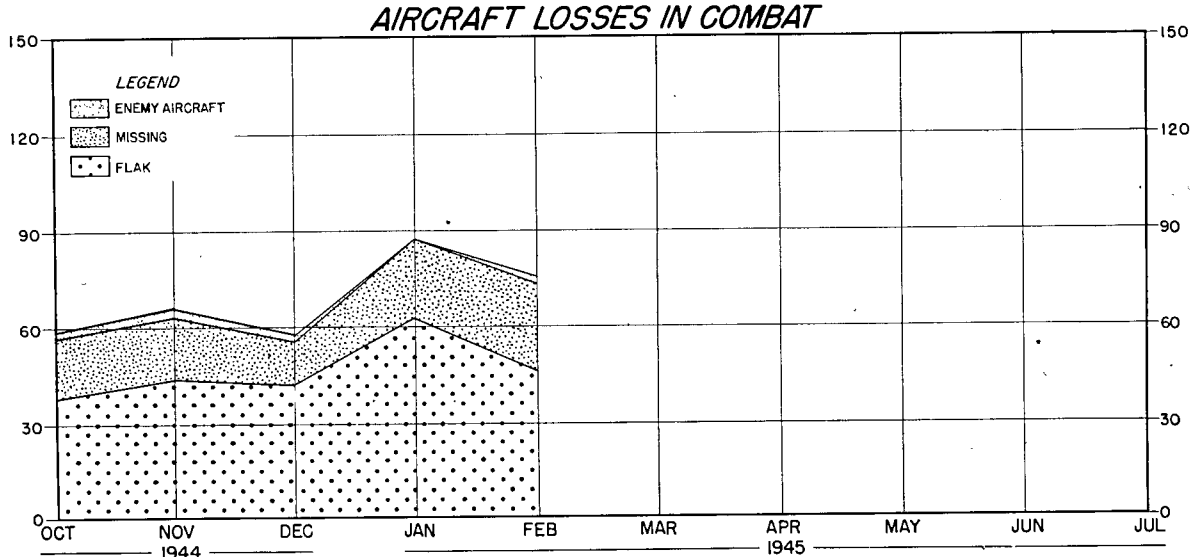
MEDITERRANEAN ALLIED TACTICAL AIR FORCE

OCTOBER 1944—JULY 1945

AIRCRAFT LOSSES IN COMBAT

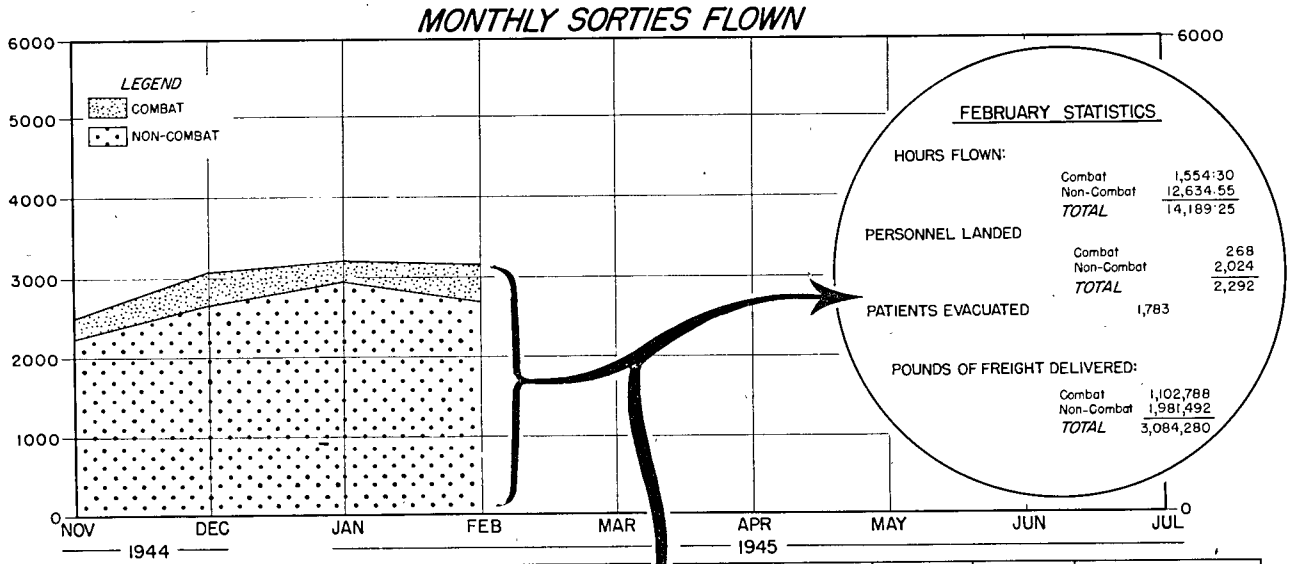


MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	MONTH
FLAK	38	44	42	62	45						FLAK
MISSING	19	19	14	25	28						MISSING
ENEMY AIRCRAFT	2	3	2	—	2						ENEMY AIRCRAFT
TOTAL	59	66	58	87	75						TOTAL

51st TROOP CARRIER WING

NOVEMBER 1944—JULY 1945

MONTHLY SORTIES FLOWN



MONTH	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	MONTH
NON-COMBAT	2,248	2,651	2,938	2,704						NON-COMBAT
COMBAT	278	425	268	489						COMBAT
TOTAL	2,526	3,076	3,206	3,193						TOTAL

23rd SCU

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