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5 September 1944.

SPECIAL REPORT

DEVELOPMENT OF CLOSE SUPPORT TECHNIQUE IN NORTH BURMA

1. Early Stages.

In November, 1943, the Chinese Army in India, under the Command of Gen. Stilwell, opened an offensive against Japanese forces occupying the Hukawng Valley. Initial base of operations was Singbwiyang, southern terminus of the Ledo Road, then still under construction.

Air force units in Assam at that time were:

Fighter Group - 3 squadrons of P-40s.
Fighter-Bomber Group - 2 squadrons of P-51s.
1 squadron of A-36s.

Prior to the opening of the land offensive, the fighter groups had maintained intercept alert in Assam Valley, patrolled the ATC sky route over Burma in protection of transports against attack by enemy fighters and had run heavy schedules of tactical missions against enemy communications, camps, dumps, etc. from the line Katha-Bhamo to the North.

There was no previous close support experience or pattern in the theater. Anticipating heavy demand for air-ground support, a series of conferences were held at once with Gen. Boatner, C.G., N.C.A.C., Ground Command, for the purpose of setting up the organization necessary to:

Receive all requests for close air-ground supports.
Screen the requests and eliminate those not suitable to air attack.
Convoy the accepted requests to air headquarters in form containing all information necessary to the proper execution of the missions
Establish necessary liaison with ground intelligence so that air headquarters would be fully apprised at all times of the practice positions of friendly troops, and, so far as possible, of enemy dispositions.

The necessary liaison to accomplish these ends was achieved by sending an air intelligence officer to G-2 and a staff operations officer to G-3. The intelligence officer kept Air advised of the ground situation. The operations officer screened and forwarded the request for close support.

2. Methods and Techniques Attempted.

a. Panels.

First means employed for indication to the fighters of enemy targets in close proximity to our front lines was the panel system. This called for the forward troops to lay out a panel indicating the position of the enemy installation to be attacked. Arrangements included:

Pointing the panel in the direction of the target.
Placing the panel a specified number of yards from the target.
Setting up the panel before the TOT, that is the time arranged for the arrival of the aircraft over the position.

Results obtained by the use of the panels were mixed. Where they could be properly laid, pilots received a fair approximation of the target location. However, the immediate terrain was not particularly suited to this type of signal. The Hukawng Valley is almost solid jungle, with trees rising to 150 feet. It was very difficult for the troops to lay the panels under those conditions. Even when the panels were laid, it was often difficult to see them from the air because of the heavy foliage.

It was apparent that it would be necessary to implement the Panel System. Conferences were held at once, and it was accordingly arranged to implement, and in many cases, to supplant the use of panels by the use of smoke shells.

b. Smoke Shells,

Plans for the use of smoke shells involved the following:

At a specified TOT, aircraft would arrive over a designated sector of the front.
Forward troops would then fire mortar smoke shells onto the position of the enemy target.
The pilots would locate the position from the risin smoke, would lay their bombs onto the position and usually strafe it heavily.

A smoke code was devised in connection with this procedure to enable the pilots to differentiate between smoke from our mortars and that from enemy mortars. Colored smoke was not available in this theater. A variety of smoke patterns were therefore used. These consisted, for example, of a quadrangle of bursts, with target in middle; or a triangle; or three bursts in row with center burst indicating target. The pattern to be used was prearranged and made part of the briefing on the mission.

This aid to the indication of close enemy targets bore excellent results on many occasions. Shortcomings, however, were quickly detected.

The thickness of the jungle often diffused the smoke and made it difficult to see from the air.
The jungle also made it difficult for the troops to do more than place the shells in the approximate position of the pinpoint target.
Frequently, our troops were not in a position to mortar at the TOT.
There was still danger of confusing the smoke of enemy shells with that of our own.

It was desired to devise a method of indicating to the pilots the exact, not merely the approximate, position of the jungle target, at the same time eliminating the element of danger to friendly troops because of the closeness of the support. At this point, A-2 at air introduced the system of relay of close support target by photo coordinate.

c. Pinpointing by Photo.

In order to make use of photography as the means of indicating the exact position of targets close to the front lines, the following factors had to be considered:

Anticipatory cover of the probable front had to be taken so that photos of a target area would be available to the troops when they reached it.
This required close liaison with troop headquarters on future strategy, and close study of enemy dispositions and movements.
It was necessary to establish a standard distribution of the photo cover to assure its availability in the right place at the time needed. This meant - to the ground troops, to air headquarters and to all squadrons participating in close support.
A standard method of reference to pinpoint on the photos had to be established.

Method of reference used was extremely simple, yet enables troop headquarters to refer to a minute point on any photo, even down to a single tree. A-2, using ordinary plastical, made and distributed to troops and squadrons a simple, transparent grid which divided the ordinary photo print into about 20 small squares. The horizontal lines of the grid were given numbers; the vertical lines letters. The number and letter of the two lines which crossed in the lower left corner of any square was obtained by dividing each side into ten equal parts, and reading right and then up. Since each copy of a photo was exactly like any other, the only information needed to pinpoint a target was its photo coordinates.

Each photo print had on it the mission number and the number of the print itself, if part of a series in the mission. Therefore, by merely giving the mission number, the print number and the photo coordinates, and exact location of a target was stated. By adding a description of the character of target, so that Air could determine the number of aircraft and the type of ordnance necessary, and adding also the location of nearest friendly troops and desired TOT, all information essential to the planning of the mission was at hand.

Anticipatory cover was at 1; 10,000 feet, which permitted sharp pinpointing. However, this was usually supplemented in air headquarters and in the squadrons by cover at 1;4,000 feet or lower for briefing purposes. With the advent of a tactical reconnaissance squadron, low level obliques also became available for detecting and pinpointing targets.

To assure speedy photo cover, and equally important, cover of precisely the right areas, and at the right altitudes, a detachment of a photo squadron and a photo intelligence detachment were placed at the disposal and under the supervision of air headquarters. A-2 screened all requests for photo cover, maintained a photo library, placed all orders for anticipatory cover and briefed the photo pilots before they went on their missions. Briefing was very important in jungle photography. It was even necessary to assign the hour of the day when certain types of cover was desired, because of the shadow factor.

Troop commanders were delighted with the opportunity photos presented to point out visually the enemy strongpoint holding up their immediate advance. Many close support missions were planned at joint staff conferences at which ground officers indicated their precise problems, outlined their own positions on the photos, pinpointed the Jap installations and joined in the planning of the air mission.

Pilots were enthusiastic over the use of photos in briefing on missions where a few hundred yards marked the difference between friendly and enemy troops. Photos enabled them to study in advance the jungle features which had to be identified in order to reach a pinpoint target. It is the great credit of the pilots, operating over dense jungle terrain at high speeds, that they developed an uncanny ability to pick out the various jungle features. Loops in rivers, turns in trails, varying shapes of groves, distinctions in the outlines of paddy fields or clearings, contours of small hills and even the difference in the foliages of the various types of trees, all details invisible to the inexperienced eye, were used as landmarks in the sea or jungle. Intelligence officers briefing cautiously on targets close to friendly troops stressed these features until the pilots had no doubt as to the position of all concerned.

Thus, in addition to giving photo coordinates, troops would describe the target as a "basha in the northwest corner of the clearing at _____" or "a row of slit trenches along the east fringe of the paddy field at _____" or even as a "mortar underneath the banyan tree at _____".

d. Radio Direction in Close Support.

In February 1944, a regiment of American infantry, containing men specially selected because of their experience in jungle warfare, joined the Chinese forces in the Hukawng Valley. This was a composite unit (Prov), (popularly known as "Galahad"). With their entry into the battle, the front quickly became fluid. These men, using quick thrusts and encircling movements, kept throwing the Jap into sudden traps. An ordinary practice was for a battalion (of Galahad men) to spear their way through and behind the Jap lines and then wait for the Chinese to close the gap. Meantime, they would receive all needed supplies by air drop and call for close support against the Jap attacking on all sides.

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They went into battle with their own air liaison teams each of which consisted of a communications officer and an air intelligence officer. When fighting became extremely bitter, flights of fighters were sent over their positions with instructions to contact the battalions air liaison radio. This was given a code name for the purpose. The enemy position causing most trouble was then pointed out to the pilots by description with relation to the nearest landmark or other identifiable feature. Pilots would then make a "dry" run over the point to make certain that instructions were understood and then be told to let their bombs go.

This type of mission was often run when the fighting was "hottest" or the situation so fluid that targets were selected as the fighters came overhead. Certain difficulties were inherent. It required that the liaison team be in a position to see both the planes and the target. It called upon the pilots to identify close targets in the jungle without previous briefing.

Nevertheless, it was a highly effective type of close support. It brought air power to bear against the enemy at a time and place when most needed by the troops. Air A-2 formed radio liaison teams for the Chinese troops and sent one in with each division. This enabled the Chinese to make use of the same type of support whenever the situation demanded it.

e. Combined Photo Pinpoint and Ground to Air Radio Direction.

This system combined the advantages of both aids described under "c" and "d". In short:

Troops reported the target by photo coordinate.
It was pinpointed on the photo, as was also the position of friendly troops.
The pilots were thoroughly briefed.
They arrived over target at an arranged TOT.
The ground-air liaison was contacted.
A dry run was made over the enemy position as briefed to the pilots.
Any error was corrected by the men on the ground.
The jungle position was then bombed.

It must be remembered that the actual targets were rarely visible from the air. The jungle offered the finest natural camouflage, and the Jap was never guilty of a breach of camouflage discipline. However, once the troops who were able to see the enemy positions from the ground, pinpointed them accurately on photos, it became merely a matter of thorough preparation and good dive bombing.

The fighters lent very heavy close support throughout the campaigns down the Hukawng and Mogaung Valleys. Typical targets were mortar and other artillery positions, dug-in machine gunpositions, slit trenches, road blocks, dug-in troop concentrations, any thing else standing immediately in front of the advancing troops and blocking their way. Results in general were excellent.

3 Close Support of Chinese and American Forces at Myitkyina.

a. Land Front.

On 17 May, 1944 the ground forces, supported by Chinese troops, siezed Myitkyina Main Airdrome. Immediately following its capture, troop carrier transports began landing heavy Chinese reinforcements and supplies. The troops deployed in the direction of the town of Mylikyina, and eventually established a continuous semicircle extending north, west and south. The Irrawaddy River bordered the town on the east.

The Jap surrounded the town with a cordon of dug-in strong points and held each one with his usual fanaticism. The battle took on the aspect of a seige, with our troops being firmly held on all sides.

It was anticipated that heavy demands would be made for close air support and detailed preparations were made to enable the execution of close support missions with the utmost speed and accuracy.

b. Air-Ground Support Organization.

It was decided that the men responsible for the planning of close-support missions should take up posts at the Myitkyina Airdrome where they would be in immediate contact with the ground commanders and in a position to coordinate and plan missions without the delay incident to communications between various headquarters. Accordingly, the Commanding General of the air force, directed his A-2 and A-3 officers to set up their offices at Myitkyina Airdrome. This was done and the closest liaison at once established with G-2 and G-3 of the Myitkyina Task Force.

At that time fighting was still going on within several hundred yards of the strip, and for that matter, during the entire battle of Myitkyina, the distance between the airfield and the front was always measured in yards. The field was only 2,500 yards from the town itself. The proximity of the battle front offered an excellent opportunity to establish a closely-knit, effective support organization.

The following channels were established:

The G-3 office set up telephonic communications to the battle front, down to company commanders.
The commanders at the front would call into the G-3 office the positions of enemy strongpoints.

G-3 would then decide which of these targets it wished subjected to air attack and assign priorities.
A conference was then held with A-2 and A-3 at which the suitability of the target for air attack was determined and a TOT arranged so that commanders at the front could be given notices of the time of attack.

The air office then planned the execution of the attack. This involved a determination of the number of aircraft which the particular target warranted, the bombs to be used, the technique and direction of attack, the selection of the unit to run the mission, the preparation of suitable briefing aids and briefings.

c. Aids Employed.

In order to furnish all concerned with a means of indicating the position of a target simply, precisely and visually, a photo mosaic of the entire front, including Myitkyina town, was prepared. Coverage was at 1;10,000 feet. A simple grid was printed on the mosaic, with horizontal lines bearing consecutive numbers and vertical lines bearing consecutive letters. The entire battle front was thus divided into small squares, each of which was simply described by the combination of the applicable number and letter. Each square represented an area approximately 660 yards square. In describing a pinpoint within the square, the same was divided into ten equal parts and the reference made by reading right and then up. In this way it was possible to point out a particular building or even a tree.

Copies of the mosaic were distributed to every company commander at the front, to the pilots for use in their planes, and all along the line in the support organization between the two. To cite a single example of its use - a commander at the front merely had to pick up his telephone to the G-3 office and say "The Jap has a 50 caliber machine gun emplacement at F5-14-8". To make more certain of mutual understanding he might add "Its under the left side of the solitary tree which stands just south of the road at that point".

The master mosaic was supplemented by low altitude coverage of the same area, and where necessary, by spot shots both vertical and oblique. In order to provide all photography necessary, without delay, a detachment of three P-40s a tactical reconnaissance squadron was ordered to Myitkyina. These brought with them a small field laboratory. Photographs cover could be ordered, and the prints produced, within a few hours. The air office ordered the missions and briefed thepilots on the precise cover desired. The P-40s were equipped with K-24s for verticals and K-17s for obliques. The verticals were shot at 5,000 feet or lower, depending on the target. The oblique were usually taken from between 50 to 100 feet.

It was common procedure for a company commander or his liaison officer to hustle back to the airfield and point out the pinpoint target on various photos, at the same time explaning the problems being encountered at the front and indicating the positions of his own troops.

Panels - As a further aid to the identification of the position of our troops nearest the pinpoint to be attacked, it was arranged that a white panel, approximately four feet wide and twelve feet long, be laid out just behind the slit trenches nearest to the target. This was done shortly before the time our aircraft were due to appear over the target.



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d. Aircraft Available.

As our troops advanced down the Hukawng and Mogaung valleys, new airfields were quickly laid out, suitable for use by both fighters and transports. One fighter squadron, first air squadron to return to Burma, was based at Shingbwiyang. This was a full squadron of P-40s. Another fighter squadron, a combination of A-36s and P-51s was put onto Tingkawk Sakan just before the assault on Myitkyina. Also there, was a flight of P-40s of a tactical reconnaissance squadron. After the airdrome at Myitkyina was captured, the Commanding General ordered a flight of 8 P-40s to that field. This was subsequently increased to twelve. Warning of the approach of enemy aircraft, both at Tingkawk Sakan and Myitkyina was practically nil.

On Assam bases were two more squadrons of P-40s and two more squadrons of P-51s. A number of these were committed to the alert of the valley. The use of the aircraft was contingent also upon the monsoon weather, which was just setting in.

e. Methods of Employment of Aircraft over Myitkyina.

Procedure One - Two different procedures were employed; one for aircraft based at Myitkyina Airdrome; the second for planes based at other fields.

The fighters based at Myitkyina Airdrome were probably based closer to their targets (the enemy front line) than any other air unit has been in the history of warfare. When the first flight reached the field, the nearest Jap installations was a machine gun position about 1,000 yards from the field that kept firing at the planes as they took off until they wiped it out with a dive bombing attack. Other enemy positions were just behind.

In the weeks of close support which followed, the pilots based on this strip were assigned the bulk of all missions in this sector, and were always given those closest to friendly troops. This because they developed a thorough familiarity with the front line and were based at the point where the most thorough briefing could be given.

It cannot be stressed too much that good briefing is the key to the success or failure of close support. There is no room for careless or inadequate briefing, since the slightest error may mean casualties among friendly troops. In briefing at Myitkyina, the finest intelligence data was available to the pilots. This included:

Complete description of the target.
Minute details on the positions of friendly and enemy troops.
The significance of the target in relation to the position of the troops.
The action our troops would take during the attack.
The action our troops would take following the attack.
Often, a description of the targets and the problems they presented, given by the troop commanders of their liaison officers.
Excellent and current photo cover.

[redacted]

Moreover, even after take-off, last minute changes could be communicated from ground to air.

This was followed by a discussion of operational details: Technique of attack to be employed, direction of bomb run, strafing, whether to be employed or not, if so, its direction, bombs and fusings.

Procedure Two - This was applied to planes based elsewhere than at Myitkyina. Since the 12 planes based there were not sufficient at all times to accomplish the numerous missions requested, it was necessary to call planes from Tingkawk Sakan, Shingbwiyang and even, on occasion, from bases in Assam.

This involved close support by radio direction and proved highly efficient. The fighters from other bases did not land at Myitkyina but came over the field at a prearranged time and contacted the ground-air liaison station there, called "Ground 21". Each of the pilots carried with him the photo mosaic of the battlefront described in para. 2c.

Each day, or from time to time during the day, the air office gave to the ground-air station a list of missions to be accomplished by flights from other fields. All information neccesary to the accomplishment of the mission was shown. Transmission of the mission to the flight overhead was simple, speedy and accurate. The flight was simply given the photo coordinate of the target plus any other descriptive matter that would eliminate any ambiguity. For example - "Bomb the building at eye-7-14-9. It's on the east side of the street at that point and 30 feet south of the street corner". Usually there was no strafing, since the object of the missions was the destruction of the pinpoints by either direct hits or near misses.

Radio directed flights at Myitkyina were not given the closest of the pinpoint targets. However, many of their targets were within 300 to 750 yards of friendly troops. The planes based at Myitkina were sometimes given targets within 25 yards of friendly troops and never inflicted a single casualty on them.

f. Effect of Proximity of Air Power to Battlefront.

The basing of aircraft at Myitkyina Airfield, while extremely risky, in view of the lack of effective air warning and the condition of the field, proved well worth the risk. To protect the airfield and other installations against surprise air attacks, intercept patrols were maintained in the area. These patrols were run by aircraft based on other fields, when weather permitted. When aircraft at Myitkina were used for this purpose the usual procedure was for them to first execute a bombing mission and then gain patrol altitude.

Speed of Support - The whole air support organization was so closely knit that a company commander could request a mission and see it executed within 30 minutes. The fighters were over their targets within a few minutes.



[redacted]

One of the pilots accomplished the record at the field completing a bombing mission in ten minutes. A good observation could lead to the destruction of an enemy installation or personnel concentration before there was opportunity to change its position.

Weight of Effort - During days of good weather, it was not unusual for a flight of 4 planes at Myitkina to accomplish a total of 20 sorties. Several of the pilots tied for the record of six missions in one day. The same flights were also able to fly when other fields were grounded by the weather - because they could take advantage of short breaks in the weather immediately over the field.

High Caliber Execution of Missions - The accuracy of the divebombing accomplished by the pilots at Myitkina was uncanny, and was generally regarded as more accurate than the artillery. This was due largely to the intensity of the work done there and to the thorough familiarity with the front lines which developed as a consequence. It was also the policy of the detachment commander there not to permit any pilot to remain who was not capable of the highest caliber bombing.

Many of the missions were dramatic, and as a consequence the morale of the pilots was kept at a high level. On one occasion the ground forces just north of the town were being held up by a string of six machine guns, embedded in deep entrenchments that started at the west bank of the Irrawaddy. The ground commander came to the airfield personnaly and presented his problem directly to the pilots. A mission was set up and the commander was asked if he wished to withdraw his men during the attack since they were less than 26 yards from the targets. He replied that the men had absolute confidence in the pilots and would stay in their trenches. In the course of the attack, the pilots dove to extremely low altitudes before releasing their bombs, using the basin of the Irrawaddy for extra pull-out space. The troops reported that the positions were knocked out by one flight which scored three direct hits. The nearest friendly troops were covered with dirt and debris from the former enemy positions, but none were hurt.

South of the town a Chinese division was being held up by a string of 3 heavy machine guns. These had inflicted no less than 400 Chinese casualties. The guns could not be detected except for the three holes through which their muzzles stuck out. A flight of four planes attacked the positions after careful planning. The Chinese commander later reported that each of the first three planes knocked out a position.

Incidents of this type occurred time and again in the course of close support in all the sectors. The attitude of the ground commanders toward the support rendered by the air force is clearly demonstrated in the letters and wires received from them from time to time.

g. Technique of Close Support Dive Bombing.

The pilots used a simple technique in dive bombing which, they maintained, if carefully applied, would keep the bomb strike, at worst, within 15 yards of the target.

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The angle of dive was 45 degrees. It was usually begun at 5,000 feet. In order to get the right angle of dive they used the simple expedient of getting the target within line of sight between the second and third wing guns. This assured the correct angle. Once in the dive, the greatest factor causing inaccuracy was drift. To prevent this, the pilots fixed their target between the center of their gun sight and the top rim of their air scoop. In this way the slightest drift could be detected and corrected at once. The pilots pulled out of their dive at above 1,000 feet.

On most of the missions, 250 pound, general purpose bombs were used. These were fuzed one tenth second delay to permit enough penetration by the bomb to dig into and blow out the enemy entrenchments. The pilots found that the penetration attained was sufficient to narrow the cone of the blast considerably. That is, the depth of the penetration was sufficient to channel the blast upwards in a cone rather than permit the usual blast dispersion in all directions. Therefore, it was found that blast effect could be easily avoided by simply leveling out and pulling away from the cone rather than following the usual procedure of pulling up and away.

h. Effect of Monsoon Weather on Operations at Myitkina.

In general, it was clear at dawn, and a flight took off very early to run an offensive reconnaissance of the roads leading to the front. The Irrawaddy was also covered in the immediate vicinity of the town. During the morning it usually clouded up and remained that way until noon.

In the early afternoon, it tended to clear and stay clear until evening. Most of the flying was therefore done in the afternoon. There were days when there was no flying at all. But that was unusual since, as has been mentioned before, it was possible to take advantage of even short breaks in bad weather. This advantage resulted in a far greater proportions of missions being flown from Myitkina than was possible at other fields. Yingkawk Sakan, for example, was only 20 minutes from Myitkina, yet the planes there were often grounded by heavy cloud between their field and target areas, even though the areas over the targets were clear at the time.

In all, the fighters ran 2,515 sorties over the Myitkyina battlefront between May 17 and August 3. While this averages 33 sorties per day, it does not at all reflect the true effort, since many of the daylight hours were non-flyable due to weather. To maintain the average, there was a continuous procession of flights over the front whenever weather permitted.

3. Battle of Moguang - Close Support of the IRP Brigades (Wingate Trained) The Chinese at Moguang.

a. Land Front.

Early in July 1944, allied forces in North Burma reached the outskirts of Moguang in a skillfully executed pincer movement. Columns of the famous Wingate brigades, moving north from the Indaw-Mawlu area, swung to the east of the town, penetrated the Pagoda Hill defenses and took up positions east and southeast of the town.



[redacted]

Simultaneously, Chinese forces moving south from recently captured Kamaing, approached the town from the north and the west.

Mogaung, which guarded both the railroad to Myitkyina and the road north to the Hukawng and Moguang valleys, was desperately defended by the enemy who, employing his usual tactics, dug himself into positions surrounding the town and within the town itself.

b. Close Support Organization.

TheIRP columns had flown into Burma well prepared for continuous air liaison, both from air supply and air support. Each column had with it an air liaison team and the necessary communications equipment. The air force had equipped the Chinese forces with similar teams and equipment.

Channels Established - Column commanders transmitted requests for air support to an indian division at Shaduzup. Chinese regimental commanders transmitted their requests to Hq. N.C.A.C. at Shaduzup. All communications were by radio. At Shaduzup, priorities were assigned to the various requests, which included not only the establishment of priorities on missions desired in the Moguang area but determination of the number of aircraft which should be allotted for close support at Mogaung as aginst Myitkyina, where the battle was proceeding at the same time.

After assignment of priorities, the missions were turned over to the air liaison officer at troop headquarters for screening and transmittal of necessary information to the air units.

c. Technique of Target Transmittal.

Photo Mosaic - As in the case of Myitkyina, a photo mosaic of the battle area at Mogaung was prepared and gridded. Copies of this key mosaic were distributed to the company commanders and to the pilots, and of course, all along the close support organization wherever needed. Targets were pinpointed on the mosaic by simply giving the proper photo coordinates. Whenever a request went to Shaduzup, it was accompanied by the photo coordinates so that the pilots, before taking to the air, had an opportunity to study the position of the target. However, at Mogaung, other aids were employed.

Radio Direction - Troops pinpointing a target also gave the position of their own air liaison team so that the flight of supporting fighters could first fly over the position of the ground radio and establish voice contact. It was an ordinary practice for the liaison team to"talk the pilots onto the targets". This was done despite the fact that the pilots had been briefed in advance and had a clear conception of the target's location. However, so close was the liaison between air and ground that corrections could be made during the attack itself. When the bombs of the first plane were off the target, the men on the ground would tell the next pilots in string to lay their bombs a specified number of feet to the right or left.

It was also the practice to receive alternate targets from the liaison team in those cases where attack on the original target was no longer desirable.

Smoke Shell - It was not uncommon, at Mogaung, to add the smoke shell to all other aids as a means of identifying the target. Thus, a flight overhead would be instructed to stand by while a smoke shell was fired. As soon as the smoke rose the man on the ground would inform the pilots of the position of the target with reference to the smoke.

In short, no effort was spared to make each mission count. The aids used for pinpointing the targets plus the aids used to correct any error in location or bombing made close support at Mogaung highly successful despite the fact that the pilots did not have the briefing facilities which were available to the pilots running their missions off Myitkyina to targets on that front.

During the period of close support at Mogaung, 423 sorties were run. Again the targets followed the usual pattern: artillery positions, machine gun nests, dumps, dug-in troop concentrations. It was rarely necessary to attack the same target twice.

4. Close Support of British Troops during a Campaign of Movement.

a. Ground Situation.

Following the capture of Mogaung, an indian division was charged with the mission of driving the enemy south along the Burma Railroad. In a war of movement, the ideal conditions which existed at Myitkyina for the creation of a support organization which made possible actual contact between troop commander and pilot, did not exist. However, if the problems presented were more difficult, they were also more representative, and the system employed will have more consistent use as allied troops continue to advance in Burma. Beginning at Mogaung, the troops pushed down to Sahmaw, next large town, then to Namkwin and so on down the railroad. The campaign continues and the scheme of close support is being used at the present time.

b. Support Organization.

The division was divided into brigades and each brigade into two columns. In the case of one brigade, one column was to advance down the railroad; the other down the main road. Brigade headquarters advanced behind the two columns at a distance of from one to five miles. In order to furnish adequate air support promptly upon request of the ground commanders and yet not be obliged to maintain fighters over the moving columns subject to call, the air force installed a tactical communications network within the brigade.

Each column was furnished an SCR 284 radio and a four man team. The team consisted of an air officer of an air support squadron and three enlisted men. The radios were transported by mules as the columns progressed. In addition, brigade headquarters was supplied with an SCR 284 radio for voices

communication, and an SCR 177A radio set for point to point transmission, together with the necessary operating personnel. The SCR 284 sets were tuned to the fighter voice frequencies and the 177A set was operated in the CW net in use by air force units.

As in the case of previous close support work, gridded mosaics were taken of the area over which the troops were advancing. Here again A-2 was careful to take photo cover in anticipation of needs so that there would be no delay. These mosaics were distributed to everyone concerned, including of course, all the air liaison teams in the chain.

Channels followed in requests for Support.

Column commanders called upon radio team chief attached to him for air support against a specific enemy strongpoint immediately in front of their path of advance. Such strongpoint was usually visible to the team chief and he was able to pinpoint it on his mosaic.

Radio team chief would then call the brigade headquarters radio team chief by voice in the clear over the SCR 284 advising him of the support requested.

The brigade commander and the air force representative with him would then decide whether the request should be honored.

The air force representative would then radio the forward echelon of the air force at Shaduzup, using CW in the clear over the 177A requesting a certain number of fighters, carrying a specific type bomb and a specific gridded mosaic which was described merely by an assigned number.

Air force headquarters would then dispatch the aircraft, at the same time supplying brigade headquarters with the estimated TOT.

Upon arrival of the flight in the vicinity of the front, the flight leader would call brigade headquarters (using the code name given it) and would then be given instructions to call the radio team of the particular column requesting the support.

Final briefing was received from the radio team of the column being supported. With the team up in the front lines, its chief was able to supply exact location on the mosaic plus details of terrain. If the team could not get within view of the target, a runner would manage to get back from the immediate front to supply any information that was necessary.

Here again, as at Mogaung, the liaison between air and ground was consistently so close during the course of the air attack itself that corrections could be made between bomb releases by the planes.

The system worked so smoothly that the air force was, and is, able to hit a pinpoint target at the front lines, using aircraft based 50 miles to the rear, within 40 minutes of the time of the initial request. The system is very popular with the ground commanders and has been outstandingly successful.

## CONCLUSIONS

The following factors are essential for effective close support aginst the enemy while affording maximum protection to friendly troops:

1. Complete air superiority.
2. Frequent, comprehensive gridded aerial photography - using verticals for orientation, low altitude obliques for target pinpointing.
3. Air-ground communication as close to the target as possible, with experienced men at the microphone (men who talk the pilots language).
4. Carefully briefed, well oriented pilots.
5. Air liaison officers with ground headquarters, with adequate communications facilities to forward and rear air headquarters.
6. Complete and current dissemination of friendly positions and enemy dispositions.