

CLOSE SUPPORT PHOTO INTELLIGENCE FOR GROUND FORCES*

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ABSTRACT

The circumstances and the psychology surrounding tactical photo interpretation make it very different from other photo intelligence analyses. The interpretation in a tactical situation is primarily concerned with defenses, artillery, supply in forward areas and personnel concentrations.

The defenses of greatest tactical photo interest are those set up by infantry, such as machine gun positions and minefields. The search for guns is through specific counter-battery photographic techniques. The supplies sought are the small dumps of fuel, ammunition and other essentials for frontline troops. Personnel concentrations may be found despite the fact that people are rarely if ever seen on aerial photographs used for interpretation.

Tactical photographic intelligence is characterized by a sense of urgency; the effort is at a level which requires immediate use of the derived information.

The needs of tactical photo intelligence require definite principles of employment. The principles are grouped into: limitations related to the speed with which intelligence can be derived from photographs and still be tactically useful, the physical location of the effort, the nature of the intelligence environment, psychological factors, and choice of interpreters with suitable backgrounds.

Tactical interpretation loses value in direct proportion to increasing fluidity of the combat situation. This is due to an irreducible lag between the time the photographs are taken and the time they can be prepared for interpretation.

The interpretation is performed best as close as possible to the end users of the intelligence. The interpreter should have the viewpoint of the combat soldier. In addition, the interpreter must keep well informed on general intelligence matters. He functions best as an intelligence officer whose particular collection method happens to be photo interpretation. Field soldiers who have been taught photo interpretation are preferred for tactical work.

I

A DISCUSSION of tactical photo intelligence in terms of films and papers could be informative and perhaps even interesting. But to really understand the nature of this vital technique, one should take a look at principles of employment, at close support needs, and at the tactical interpreter's state of mind. The circumstances and the psychology of tactical photo intelligence make it so different from air photo industrial analysis, for example, that the relationship is no closer than cousins twice removed.

The interpreter in a tactical situation finds that he must run in four directions at once. This is because the items of greatest tactical interest which are also amenable to photo intelligence are:

1. Defenses, primarily those set up by infantry.
2. Artillery.
3. Supply in the field; fuel and ammunition and maintenance facilities.
4. Concentrations of personnel and areas where they may shelter.

Permanent fortifications like the Siegfried Line are not the initial concern

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of the tactical interpreter. These installations are studied and plotted long before they fall in the tactical area. He watches them of course, and they are the subject of lengthy conferences with the rest of the intelligence section. But what worries him most is that he will miss a newly laid minefield or fail to spot a machine gun position. He wants to know why trees are being felled on a certain hillside; is it for lumber, for log bunkers, or to clear a field of fire for a pillbox not yet erected? And what about the shallow pits in just the right place for mortars; are they new or is it just that the tree shadows fell differently in earlier photographs? These deadly minutiae, photographically on the hand-to-hand level, are the proper sphere of the tactical interpreter.

Artillery of course is a tactical weapon so there is no question as to where it must be detected. The same responsibility extends to tactical rockets (not the dramatic spaceship variety). Normally the tactical interpreter learns to search out artillery in two ways:

First of all, he commonly finds some guns as by-products; he is looking for a defiladed approach for a patrol perhaps, and he notices some objects too shapeless to be normal. Camouflage? Long slope nets would look like that, he thinks, and so might agricultural debris. On the other hand, these dots look too lonely, they are too queerly placed in the field to be agricultural, and look at the pattern they make. It is all very suspicious to the hypersensitive interpreter; even haystacks have been known to shoot. The pattern and the fine field of fire, the perfectly logical place for a battery, the shell reports coming from the area since the day before the picture was taken; these begin to point to a conclusion. Moreover, the dots have not been there before and no such agricultural activity is visible elsewhere. Guns it is.

Secondly, high priority demands are thrown at the interpreter to find particular guns or batteries which have distinguished themselves by being both painful and invisible. Out of this grows proper counterbattery technique. Indeed, hidden guns are so painful so often that some tactical interpreters become specialists and do only counterbattery work, leaving everything else to their assistants and colleagues.

As the interpreter looks farther behind the main line of resistance the objects of his intentions vary. For instance, he searches the side of a road for piles of ammunition and he looks for likely warehouses. Now he pauses at a wooded area with a road running through it; he has seen it many times before, and there have always been vehicles in the woods or leaving the woods or entering it. Through the trees he can pick out unmistakable track activity. This could be, he thinks, a roadside rest area. But it isn't. It is a fuel dump. Moreover, he reasons, by the pattern of the trackage there might well be some ammunition too; it is an unquestionable and irresistible target.

Tactically, the discovery of the day-to-day sustenance of the enemy is as important as spotting his guns. However in forward areas huge dumps are rare. So the photographic hunt for food, clothing, fuel and ammunition, degenerates into a never ending search for a multitude of small piles of material that the forward supply echelons deposit in woods, along roads, near convenient landmarks, for the daily or weekly requirements of the front-line troops. The interpreter watches these dumps grow and diminish and grow again; after they move he doggedly sets about finding them again.

And lastly there is the matter of personnel, the ultimate target. The tactical interpreter wants to find their hiding places, the bivouacs, billets, barracks and bunkers. He does it, moreover, with some success if he is skilled; this is a neat feat considering that he rarely if ever sees any people on his photographs.

Detection of personnel is self-limiting in that time is not wasted on unprofitable targets; they are invisible unless in good concentration. The interpreter looks for the effect that concentrations of personnel have on their environment, much as a physicist looks at a meson track on a photographic plate and, without ever having seen the meson itself, knows with absolute certainty that it has been there. At the same time, there are few important aspects of tactical photo interpretation which require a greater general intelligence sense.

Now the significance of these items of prime tactical photo interest is not limited to their own undoubted importance. Consider them from the viewpoint of the end users of the intelligence. If some of today's photographs bear the particular little dots that may mean mortars or machine guns or mines, it will help tonight's patrol not at all to learn about them tomorrow. And what of the anti-tank guns also newly visible? A tank raid kicks off in two hours. The cry is constant and unvarying, "we want to know *now*."

As a matter of routine, the tactical interpreter works with his customers sometimes literally hanging over his shoulder. There is always a deadline for warning one element or another and the interpreter regularly operates under the nagging pressure of a host of blobs and dots, all clamoring for attention by the same deadline. In the tactical situation moreover, the interpreter has a personal interest in his speed and thoroughness. It is entirely possible that a gun he does not find at four in the afternoon will blow him into the sky, trusty stereoscope and all, at nine in the evening.

The word which characterizes photographic counterbattery intelligence is "urgent." The guns which are particularly referred for photographic search are the ones that hurt most. They hurt most because they are not found easily or at all by other means. They are not found by other means because very often these guns have several prepared positions which they occupy in rapid rotation. These factors call for the utmost rapidity in discovery and report.

So if the interpreter is given a sortie on Monday, he must interpret it completely on Monday because the gun he finds on it on Tuesday has very likely either killed his friends or moved away. It is a fleeting target. Even on Monday, in fact, the signs of unusual personnel activity the interpreter finds may only be the evidences of the previous night's concentration and attack. He maneuvers around this by keeping a running file, available for instant targetting, of those places where men could advantageously and safely accumulate. But this strategem is itself a tribute to time.

The interpreter who is acquiring tactical experience learns quickly that his activities must be attuned to an urgent tempo, that is part of the technique. He works in tremendous spurts which are triggered by the arrival of each fresh sortie. He never has time for the studied subtleties of the grand plan or masterly revelations.

There is then an inescapable fact: the mistress of tactical photo intelligence is speed.

II

If a little thought is given to what the tactical interpreter does, tactical needs in other words, and how he does it, it can be seen that certain conditions would enhance effective operations. The principles developed here are controversial; some interpreters are opposed. Surprising unanimity exists however, among those interpreters who have actually worked in a tactical situation. These conditions, or principles or requirements fall into these general categories:

1. Limitations related to the speed with which intelligence can be derived from photographs and still be tactically useful.

2. The physical location of the effort; where should the interpreter interpret?
3. The nature of the intelligence environment in which the tactical interpreter operates.
4. Psychological factors differentiating tactical interpretation from other types.
5. How should tactical photo interpreters be chosen; should the requirements be different because of tactical demands?

Tactical interpretation is bound by the photographic process far more than is appreciated by strategic interpreters or experts on urban analysis. Limitations begin when the photo plane takes off on a mission. It takes time, a minimum of time, it is true, to actually take the pictures and return to the airfield. Much more time to make the prints. Meanwhile the newly photographed machine gun position has been manned and has picked off two men on patrol. The airfield, of course, is not on the front lines or even close to it, so it takes more time to transport the photographs (by now a very bulky package) to the interpreter. How much time is lost? There are too many variables to permit even an approximation of the average lag from the moment of exposure to the finished print under the interpreter's stereoscope. But as a working supposition it might be held that if the photographs were taken at ten in the morning, interpretation might begin at five or six in the evening.

This in turn leads to a number of tactical working habits. For instance, when there is only minor movement on the front, the value of photographic intelligence far outweighs the disadvantage of a time lag. But when the battle is hot, when the main line of resistance is moving rapidly, when it is fluid and wildly fluctuating, it takes too long to obtain the photos and squeeze the intelligence from them for the information to be trustworthy at the moment of report. There is a middle ground; good technique and efficient organization compress the time lag, so that photo intelligence retains its utility even when the situation becomes more and more fluid. But as a generalization it might be said that the real use of photo intelligence is before and between attacks, not during them. In a rapid advance, photo intelligence is not the most useful tactical information available.

This means that the tactical interpreter experiences cycles of feast and famine. When the front is fluid his interpretation activities are negligible. When it is static, they are overwhelming.

Now one way to shorten the time lag immediately comes to mind; why not let the interpreter do his work at the airfield where the photo plane lands? Why, in fact, should he do it anywhere else?

Let the nature of the tactical situation make the decision. For instance, it is much more effective if the interpreter personally assists in the briefing of a patrol than if a written report is all that is available. Writing a report, even a sketchy one, might in fact entail enough delay to counterbalance the gain made by stationing the interpreter at the airfield. So that if delay must occur either in delivery of the photographs or in delivery of the information, which is the least worst? Of the two, it is far better to deliver the photographs rather than the information.

The case for delivering the photos is made stronger by this fact: if the information is delivered, instead of the photos, the intelligence is derived by an interpreter far removed from the front. Not only is this inconsistent with good practice, but front line troops are usually suspicious of tactical decisions made in rear areas. Even if delivery of the actual photos takes much longer than the messaged information, the photos themselves are infinitely more useful.

In addition, the photos themselves are needed quickly by many people in

addition to interpreters. These include divisional and regimental commanders and air observers and a great many more. And there are frequent situations when, unexpectedly, the advice of a photo interpreter familiar with tactical concepts is needed on the spot.

There are too many arguments against permitting tactical photo interpreters to function in any place other than lower echelon headquarters. If an interpreter is primarily concerned with an area facing a division, for instance, he is most effective at division headquarters, not at corps or in some central photo installation. How else can he possibly understand what is expected of him, how he is to provide it, and how fast? The tactical interpreter should be as close as possible to the end users of his information.

The interpreter in a tactical situation dares not work in a vacuum. Look at the task. The interpreter does not actually see guns or trenches or wire under his stereoscope. He sees a miniature three dimensional illusion which becomes operationally meaningful only in the light of his training, his experience, his immediate environment and perhaps some chance remark he heard yesterday in the intelligence section. To make useful sense out of what he sees, the interpreter has to study the thinking of his enemies, he has to learn the characteristics and employment of their weapons and he has to know their collective habits. To do this effectively, and to keep his information current, he must be close to the enemy.

For instance, it may be a well known fact at the regimental level that the enemy is at the moment showing a particular preference for billeting in houses rather than bivouacing in the woods. If this fact is ever reported to higher headquarters at all, it will be contained as a sidelight in a lengthy intelligence summary which may or may not be seen by the photo interpreter. But this minor item is common knowledge at battalion or regiment or division and the interpreter can successfully target a group of buildings which arouse his suspicions, and which serve not only as a barracks but also as a command post.

The tactical interpreter works best when he functions as an intelligence officer whose particular collection method happens to be photo interpretation. He needs to keep abreast of order of battle, prisoner-of-war reports, documents reports, analyses of weapons, capabilities and intentions. These tell him where to look, why to look, and how to explain what he sees. He does not have to waste time, his scarcest commodity, on a millimeter by millimeter search of each print in a sortie.

Tactically, the interpreter must maintain his access to ground information and he must identify himself with other basic intelligence activities. Otherwise he can furnish only mechanical photo reading, not photo interpretation. The interpreter has to grasp the general intelligence picture and apply it to his own particular problem. The prerequisite is tactical erudition.

This explains a characteristic of ground force tactical interpreters; they are conversant with a great many intelligence matters which superficially would seem to be none of their concern.

Because of his physical location, because of the particular pressures under which he works, and because he often sees the results of his interpretation with his own eyes, the tactical interpreter feels that he has little in common with other interpreters farther to the rear. This may be, in part, the common attitude of combat men toward support troops but, even if it is, it enhances the tactical interpreter's worth.

Tactical interpretation cannot be performed successfully out of range of shells and bombs. The tactical interpreter must have the viewpoint of the

combat soldier, not only to understand his photo intelligence needs without being told, but also to understand the activities of the enemy. The reasoning that comes naturally at division or regimental headquarters is too often dismissed as "the working level mind" at Army Group. The recurring sudden crises which are a part of combat, and which demand the instant attention of an interpreter, may well be labeled bumbling at a theater center and be handled grudgingly, if at all, by interpreters unfamiliar with tactical events.

In view of these matters then, how should tactical interpreters be chosen? Should their backgrounds be different from the backgrounds expected of other photo interpreters?

There are differences of opinion among interpreters on this issue, too. This is due in part to the historical development of photo interpretation and of photogrammetry, which, for military engineering and peacetime uses, leans heavily on the earth sciences. Men learned in physiography, geology, geography, agronomy, forestry, and so on, are the largest peacetime advocates and practitioners of the aerial photo arts.

When a wartime need arises for men skilled in air photo use, these earth science specialists represent the nucleus of familiarity, and their views and practices affect procurement thinking. It is only human nature that men whose lives are devoted to an allied science will reason that photo interpretation is severely limited, or even impossible, without the basic knowledge that they themselves possess. The reasoning is self-perpetuating and becomes more firmly fixed as more and more earth science colleagues are brought into the field.

The tactical interpreter however, tends to take a somewhat different view. He generally feels that men with an earth science background can make excellent interpreters, but that for tactical work certain other requirements are desirable. *He* prefers field soldiers who have been taught photo intelligence techniques.

He reasons this way: tactical interpretation demands a state of mind and a combat attitude as much as it asks for specific knowledge. A geologist, for instance, can develop these attitudes if he lives and works in a combat situation, and he can learn the details and techniques as well as anyone else. But the old soldier, just like the geologist, need learn only the interpretation; he can do it as well without the geology background. The common denominator is the tactical sense, and considering that the areas of effort are detection of defenses, artillery, supplies and personnel, it can be argued that an earth science background is not as valuable as is often supposed.

Well, what about trafficability studies, pre-construction analyses, and similar needs? The tactical interpreter answers that engineers trained in photo interpretation are the best qualified, and that they can do work of this nature better than the interpreters with earth science backgrounds. He considers that the kind of non-engineer trafficability intelligence a tactical interpreter must furnish is as easily learned as is any other interpretation technique. It may well be so.

So the principles of employment work out to something like this:

1. Tactical photo intelligence loses effectiveness when the main line of resistance is moving very rapidly. Do not expect miracles when the battle is fluid.
2. The tactical photo interpreter should be located as close as possible to the end users of his intelligence.
3. The tactical interpreter should be provided with and should maintain a high level of current general intelligence information.

4. Tactical interpreters should feel an identity with the combat soldier and they should provide intelligence in accord with the combat viewpoint.

5. Greater use should be made of potential tactical interpreters with basic military arms experience rather than earth science backgrounds.

Close support photo intelligence for ground forces is an effective combat weapon and, like any other weapon, it should be used—not abused.

NEWS NOTE

U. S. ARMY ENGINEERS WILL USE HELICOPTERS FOR SURVEY TESTS

Surveying tests using helicopters over a 3,000 square mile area of barren terrain between Phoenix and Tucson, Arizona, will begin February 1st, the U. S. Army Corps of Engineers announced today. The Helicopter Survey Test, including approximately 30 men, mostly civilians, is a project of the Engineer Research and Development Laboratories, Fort Belvoir, Virginia.

Purpose of the test is to determine the feasibility of triangulation surveys across inaccessible terrain by simultaneous observations on a helicopter from several ground stations. Since most of the test will be conducted at night, a light suspended below the helicopter will be used as an observing target.

Triangulation stations from which observations will be made have been previously established in the rear and forward areas by the U. S. Coast and Geodetic Survey. By employing two-way radio communication, ground observers will make simultaneous determinations of directions from their stations to the helicopter with precision survey instruments.

The results of the test, longitudes, latitudes and elevations will be checked against previously determined results arrived at by conventional survey methods.

Field headquarters for the test will be located at Casa Grande, Arizona. The area selected for the test is about 30 miles wide and about 100 miles long. It is expected that the test will extend over a period of 45 days.