INTELLIGENCE PREPARATION OF THE BATTLEFIELD:
THE MARINE CORPS VIEWPOINT

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Introduction

Intelligence Preparation of the Battlefield (IPB) is a term much in vogue. In evaluating the utility of IPB, it is important to distinguish between four distinct elements of the IPB process: terrain analysis, decision point and time/space phase line methodology, doctrinal templates where established, and the creation of mission area overlays. It is important to understand that IPB is a process, not a substitute for analysis, and that the IPB process can not be accomplished without substantive data of two kinds: terrain data, and doctrinal data. It is essential to understand that the operator, not only the intelligence professional, must play a role in the IPB process; that IPB is labor-intensive; and that automation, while offering some help, is not a cure-all to the fundamental question that haunts every commander: "What is on the other side of the hill?"

IPB Basics

IPB was initially developed by the U.S. Army to defeat enemies with rigid and known doctrine (Soviets and North Koreans). Basic IPB doctrine is contained in FM 34-130, "Intelligence Preparation of the Battlefield".

There are four major IPB templates used to inform the commander:

♦ Doctrinal Template. How the enemy would like to fight if unconstrained by weather or terrain. This includes, when known, the enemy’s normal disposition of forces including the size of the front assigned to different units, and the general location of supporting units in relation to higher headquarters and the infantry units.

♦ Situational Template. How the enemy might have to fight given terrain and weather constraints. This is the intelligence estimate in graphic form.

♦ Event Template. Provides the information needed to project what must occur in relation to different enemy courses of action, i.e. indications of intent. It forms the basis for the collection plan.

♦ Decision Support Template. This is the operations plan (including enemy situation and friendly mission/concept of operations) is graphic form. It portrays who, what, where, when, and in what strength. It shows decision points, time phase lines, named and target areas of interest, and significant events and activities.
IPB Assumptions

IPB pre-supposes the following conditions, all of which are increasingly irrelevant in the era of non-conventional conflict:

- That the enemy has a doctrine
- That the enemy follows that doctrine
- That we know the enemy's doctrine in detail
- That we have an extensive knowledge of the weather and terrain in our area of operations

Terrain Analysis

The Marine Corps uses IPB, and has used aspects of IPB throughout its history. In earlier eras, and still today, IPB techniques focus on terrain analysis. Through review of maps, overflights in observation aircraft, and actual ground reconnaissance, Marines answered essential elements of information (EEI) pertaining to cross-country mobility, inter-visibility (line of sight) distance, cover (protection from fire), and concealment (protection from observation). Terrain analysis also seeks to identify mobility corridors for maneuver warfare, as well as sites which have military significance. Terrain analysis is a critical means of ensuring that combined arms targeting is focused on key terrain, avenues of approach and their related choke points, and essential military and line of communication (e.g. bridges) targets. It merits comment that terrain analysis is itself constantly subject to changes in technology as well as doctrine--instead of hilltops, defiles can become key terrain; as Nape of the Earth (NOE) flying increases, NOE mobility corridors and inter-visibility arcs must be identified.

Modified Combined Obstacles Overlay

Marine Corps instructors at the Navy-Marine Corps Intelligence Training Center (NMITC) have developed methods of teaching a quick-reaction IPB process. This begins with a Modified Combined Obstacles Overlay (MCOO) and then, with a friendly courses of action and enemy situation overlay, leads quickly to the creation of event and situation templates. The MCOO is an extension of techniques which have been taught by the Marine Corps for decades. For example, basic training includes instruction in the color coding of 1:50,000 scale maps to highlight ridge lines and streams.

Marines trained in the MCOO process have shown themselves capable of rapidly assessing the terrain to identify mobility corridors and avenues of approach,
key terrain, cover and concealment opportunities, and general cross-country mobility and inter-visibility (line of sight) constraints. Perhaps more importantly, they are also able to quickly create an overlay useful to the commander.

Decision Point, Time/Space Phase Line Methodology

Army intelligence has made an important contribution to IPB methodology by institutionalizing the process of calculating key decision points where the commander can take action with some assurance that the enemy's intent is known, and also phase lines where the enemy can be expected to appear given a pre-determined rate of advance.

In the past, Marines typically identified the location and form of transport available to various enemy units, and the time it would take them to reach Marine units. The Army contribution is an important one because it facilitates the establishment of named areas of interest (e.g. intermediate crossroads where one can determine which mobility corridor the enemy will use) and target areas of interest (specific choke points to be attacked once the enemy's choice of mobility corridor is known).

The next step in refining the IPB process is to calculate the starting point, speed, loiter time, and launch distance of available combined arms systems, in order to most efficiently apply available combat power. It will be a few years before we are able to fully automate this idea; the idea is noteworthy because it is a precursor to the day when IPB is fully integrated into operations. The "sensor to shooter" connection will take place in real-time and near-real-time, with little or no distinction between intelligence (observing the battlefield) and operations (acting upon the battlefield).

Doctrinal Templates

The use of doctrinal templates is helpful when years of study have established an enemy's doctrine with sufficient confidence to assure such templates are accurate. Doctrinal templates seek to take an enemy's known table of organization and establish where an enemy would normally position their related forces. For instance, if a division headquarters can be located, and one has a doctrinal template, the general location of the division's artillery batteries can be surmised, and reconnaissance used to confirm specific locations.

This is the most overrated and misunderstood aspect of IPB, because it assumes both a conventional enemy, and the availability of knowledge of the enemy's doctrine. It took forty years for the Army to develop doctrinal templates on the Soviets. We do not have doctrinal templates for the armed forces of Third World countries (or allies who could conceivably become opponents), nor are we
likely to establish doctrinal templates for non-conventional enemies such as those represented by terrorist groups, narcotics gangs, and guerilla organizations.

It should give us pause that our non-conventional as well as our conventional enemies undoubtedly have doctrinal overlays for our forces.

On a positive note, experience has shown that historical pattern analysis, at a very high level of detail (individuals, specific vehicles down to the individual horse or donkey), can yield patterns of movement, including preferred routes and times, which constitute non-conventional doctrine. However, it is important to emphasize that such analysis requires a basic investment of time and attention before a "critical mass" is reached. In other words, if on-going encyclopedic intelligence about LIC enemies is not being maintained by someone, forces arriving in the area will of necessity have to go through a period of time when basic collection and data base building must occur. Until that basic data base is established, it will be difficult if not impossible to do analysis.

Low Intensity Conflict Order of Battle

The difference between conventional order of battle (OOB) intelligence and low intensity conflict (LIC) OOB can be characterized as the difference between "top down" and "bottom up" collection and analysis. Conventional OOB, available only for conventional enemies that have been studied exhaustively (e.g. the Soviet Union but not most regional actors), begins with an encyclopedic data array which assumes that all known units remain available to the enemy. As battle occurs, battle damage assessments (BDA) are made, and personnel and equipment casualties subtracted from the existing OOB. In conventional OOB, the emphasis is on military units and major items of equipment.

In LIC, this is not possible. Both OOB and doctrine--to the extent doctrine exists--must be established from scratch, or through a "bottom up" approach. This is extraordinarily important to intelligence planners and programmers because it requires different intelligence organizations, training, and equipment. Essentially, through comprehensive observation of the area of operations, including extensive coverage by human assets, the intelligence professional must gradually piece together an understanding of individual personalities and their inter-relationships with one another, as well as piece together what food, clothing, equipment, sanctuaries, and so on are available to them.

LIC OOB cannot be reliably established through technical means, as the latter were designed for tracking obvious conventional equipment, and are virtually useless in tracking "low slow singletons", either on the ground or in the air.
LIC IPB

Marine staff at NMITC have made significant contributions to the LIC IPB chapter in the forthcoming Army publication FM 34-7 "Intelligence and Electronic Warfare Support to Low Intensity Conflict". Specifically, they consolidated and refined a number of lessons learned from previous conflicts, to include original work on portable terrain modeling systems. Marines also coordinated comments on the volume as a whole. LIC IPB is an area in which the Marine Corps has excelled; LIC-related EEI for constabulary and expeditionary operations can be found in the now-famous "Small Wars Manual" developed by the Marine Corps in the 1930's. The foundation of War Game ORANGE, a thorough understanding of operational geography in the Pacific, was the original work of a Marine.

Mission Area Overlays

Overlays are not new. However, the Army’s IPB process, especially as refined by the Army Intelligence Agency (AIA) Intelligence and Threat Analysis Center (ITAC) during Desert Shield/Desert Storm, has significantly increased general understanding of the utility of overlays in helping the commander shape and exploit the battle area. When added to our standard terrain analysis overlays (which include variable hydrography depending on the season and weather), overlays for helicopter routes, artillery, mine warfare, bio-chemical warfare, and so on can be very helpful in identifying employment opportunities and constraints, and orchestrating the combined arms team as it engages the enemy.

It is important to understand that the IPB process, and the creation (and duplication) of overlays at the 1:50,000 scale, is a very labor-intensive process. Although a skilled individual can create a single over- lay in less than half an hour, it takes almost as much time to make a duplicate. When ten to twenty duplicates are required, and the situation changes so frequently as to require new overlays on a regular basis, this becomes such a time-consuming and logistically difficulty to support activity (because overlay plastic is bulky and difficult to move around) that many commanders forego the convenience of illustrated overlays. Even when automated—and we as well as other services are automating this process—the equipment to produce overlays will only be at the regimental/group level, and the time required to produce the overlays will be constrained by the relatively slow speed of color plotters.

In the case of the Army, personnel structure has been provided at the corps and division levels to support the labor-intensive IPB production process. The same is not true of the Marine Corps, where intelligence structure is not only austere, but intelligence manning is severely constrained (not enough "faces" to fill too few "spaces").
With experience individuals learn to integrate their understanding of the situation into an internal mental picture which is then "projected" on to the map. This is helpful in extremis. However, the IPB product is so useful—as useful as true image is to a pilot or ground commander—that any technology which permits IPB products to be rapidly created and exploited at the lowest possible tactical levels (down to the platoon) merits pursuit. The primary constraint at the lower tactical levels, besides cost, is the weight, bulk, and printing time associated with color printers.

Our commitment to the IPB process is worth stressing. The Commandant of the Marine Corps, addressing the Marine Corps Command & Staff College on 15 August 1991, stated that the Marine Corps would "do IPB". Our implementation of this direction has focused on ensuring that Marines understand the process and develop the products, but also strive to meet the substantive needs of the commander for fused analysis. IPB is not a substitute for analysis.

**IPB Automation**

Few people seem to be aware that the Intelligence Analysis System (IAS) developed by the Marine Corps Systems Command (MARCORSYSCOM) in response to requirements originated in the Fleet Marine Force (FMF) and validated by the Marine Corps Combat Development Command (MCCDC), has eased the task of fulfilling the IPB analysis functions described above.

The Army HAWKEYE system was influenced by Army intelligence personnel who worked with a prototype of IAS. There is little substantial difference between the HAWKEYE and IAS "toolkits", outside of the addition of Army doctrinal templates to HAWKEYE. IAS, and its sister system in the USMC Intelligence Center, the Marine Corps Intelligence Center Information System (MCICIS) both integrate geographic information systems and digital mapping data. Other Marine Corps systems which integrate digital mapping data—when it is available—include the Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) and the Tactical Aviation Mission Planning System (TAMPS).

On the Army side, both ITAC and Forces Command (FORSCOM) have developed superb technical capabilities allowing imagery to be annotated and related overlays to be constructed, all at the 1:50,000 scale, and both disseminated electronically. This is a feature whose importance cannot be understated, for it truly enables intelligence production facilities at fixed sites to provide fused all-source tactical products to individual pilots and ground commanders operating on a fluid battlefield where tactical intelligence centers cannot maintain such sophisticated automation capabilities. It is however totally dependent on the availability of digital imagery and collected information about enemy OOB, as well as secure communications and remote printing capabilities.
Also, as should be clear throughout this paper, existing automation processes—both Army and Marine Corps—founded on the "old IPB" which assumed a conventional enemy, are not well suited for the kind of pattern analysis and in-depth detail that is necessary for LIC IPB.

**IPB's Achilles Heel**

The utility of IPB, whether manual or automated, is absolutely dependent on the degree to which hard-copy and digital mapping data is available. This is the "achilles heel" of IPB. The hard-copy maps and the digital mapping data needed for expeditionary operations, including humanitarian assistance missions and non-proliferation raids, simply do not exist.

As one officer put it, "IPB (mapping data) is near the bottom of the food chain when it comes to asset allocation from the national level on down". Translation: "Worst case" contingencies, predominantly associated with the Soviet Union, have consumed virtually all of the national reconnaissance resources upon which map-making depends. Priorities for Third World countries have been so low in relation to Soviet-type contingencies that the maps—literally—do not exist for much of the Third World.

As determined by the USMC Intelligence Center in a study published by MCCDC in 1990, of 69 countries then of interest to the Marine Corps, 22 had no 1:50,000 scale maps available, 37 had old maps (i.e. not showing roads and airfield constructed in past ten years) for ports and cities but not maneuver areas. Of the ten remaining, while complete coverage was available, the maps were old and therefore unreliable in terms of cultural features.

Apart from the issue of hard-copy maps (and the time-consuming process of putting them together in tight quarters aboard ship, or ashore under austere circumstances), there are tremendous deficiencies in both the availability of digital data, and its dissemination. At this time, units with equipment to process digital data consider themselves lucky to receive Digital Terrain Elevation Data Level 1 (DTED 1). DTED 1 has no cultural (man-made), vegetation, or hydrographic features—only elevations. What units actually require, and rarely obtain, is Digital Feature Analysis Data (DFAD) Level 3 (DFAD 3). This level of data included locations, vegetation, drainage, urban areas including prominent buildings, and major features such as powerlines and radio towers.

**Generic Showstoppers**

Apart from the fundamental deficiency with respect to hard-copy maps and digital mapping data, there are two generic showstoppers which will constrain the utility of IPB for expeditionary operations in the Third World:
Existing national and defense intelligence capabilities are unsuited for the collection of intelligence about individual personalities and their capabilities in a LIC or non-conventional environment. In addition to needing an extraordinary increase in national (or defense) clandestine human intelligence capabilities deployed overseas, we need a very substantial increase in tactical sensors and scouts; linguists; and automated logbooks/digital cameras to be used by individuals at fixed guard posts and observation posts. The doctrinal templates for Third World IPB simply do not exist, and are unlikely to ever exist because LIC OOB is a "come as you are pick up game". The nature of the enemy will vary from place to place and situation to situation.

The foundation for evaluating LIC information to produce fused intelligence does not exist. Our national and defense intelligence analysts generally lack the in-depth knowledge of the cultural, political, economic, demographic, and geographic realities within which any collected information must be appraised. Perhaps worse, the databases about individual personalities, especially personalities outside the capital cities, does not exist. It will take years to build up this capability within government, assuming (with great skepticism) a firm commitment from intelligence community managers to ensure analysts are afforded opportunities for travel and training pertinent to their responsibilities.

Conclusion

IPB should be regarded as a three-level process: maps constitute the first level. We don't have them. OOB, the identification and placement of specific individuals and equipment on the battlefield, constitutes the second level and requires near-real-time collection and reporting capabilities which do not exist today for the "low slow singleton" target environment. The third level is much more subtle and requires an understanding of culture, training, attitude, and intent such as can be achieved only through a lifetime of study.

IPB as a concept is not new. However, some of the methods are. The Marine Corps uses IPB, and has made original contributions in this area. Deficiencies in Third World and non-conventional forces intelligence will continue to constrain the utility of doctrinal aspects of IPB in Third World LIC environments.
Contributions to this paper were made by LtCol Paul Leon, LtCol Paul Nagy, Major Pat Carey, Major Floyd Houston, and Major Richard Lake. Please address comments to Mr. Steele at (703) 693-5422.
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