Tests of Truth

Both inductive and deductive reasoning involve three basic tests of truth that intelligence analysts employ to determine the truth of propositions.

Correspondence Test of Truth

The theory that truth is a statement that corresponds to reality is known as the correspondence test of truth. An analyst, who is studying an information report, notices that the presented information is the result of first-hand observation. Knowing the source to be professionally competent, the analyst assumes that every statement in the report corresponds to reality.

In the example, the statements or other evidence corresponded to reality. To test the degree of correspondence, observations are required. These observations must be tested by additional observations. The chief criterion in observations is objectivity, and using a mix of collection assets can attain greater objectivity.

Analysts naturally place more confidence in one source or system than another. In the case of the UAV report verses the pilot's report, the analyst had more confidence in the UAV's ability to observe the target from multiple aspects. The UAV-derived information had more credibility than the pilot's report, because the pilot may have only had a fleeting glimpse of the target while trying to egress. When a variety of sensors tend to corroborate each other, confidence in the conclusions increases.

The correspondence test of truth requires observations to test whether or not, and to what extent, statements correspond to reality. One problem with this theory is that the threat seldom permits direct observations and often goes to great lengths to prevent direct observations or to deceive those observations.

Example: Correspondence Test of Truth.

Pilots returning from an interdiction mission claim three tanks destroyed. The squadron chief interrogated each pilot separately and they gave substantially the same report.

Assuming the pilots' claims are accurate, then it would reflect reality. By reporting battle damage assessment of three tanks probably destroyed, the squadron chief is adhering to the correspondence test of truth.

Despite the fact that all pilots of one flight claimed three tanks destroyed, the MAGTF commander wants more supporting evidence. To provide confirmation, the MAGTF G-2 plans an UAV mission over the area where the tanks were reportedly hit. Both the commander and the G-2 are placing more credibility in visual evidence, because it is believed to be more objective and less prone to human error. This ignores the fact that video requires interpretation, and this interpretation involves a degree of subjectivity.

Humans must interpret all images. When humans interpret images, they use subjective judgment. One of the weaknesses of the correspondence test of truth is that observations are required to establish the truth. Invariably, these observations must be tested by other observations.

The UAV tape revealed three badly damaged tanks in defilade. The MAGTF battle damage assessment analyst considers the UAV report along with the pilot debriefs. Based on the combined information, the analyst reports three tanks confirmed damaged.

Coherence Test of Truth

This test of truth uses consistency with other ideas or facts to validate statements. Where direct access to the threat is denied, the coherence test of truth becomes necessary. The coherence theory refers to how consistent different pieces of information are in relation to each other. An analyst considering a new piece of information

that corroborates known information would place more credibility in the new information and the conclusions drawn from it.

In the realm of theory, intelligence usually works with some factual basis for most inferences or conclusions. The coherence test of truth supplements the correspondence test of truth.

Example: Coherence Test of Truth.

In the latter part of September, the commander in chief's intelligence staff considered the following information:

- The ACME coalition countries normally conclude a training cycle with a large-scale combined exercise (historical record).
- Visitors to Coyote Land reported being denied access to certain areas in the vicinity of Road Runner in the western Tunnel Province (confirmed report).
- Reports indicate certain infantry, armor, and engineer units from Tasmania, Elmer Land, and Chickenhawk have moved from their garrison locations (unconfirmed reports).
- All commercial air traffic to Road Runner will be restricted for a period of 2 weeks, starting 1 October (confirmed report).

The intelligence staff concluded that this year's ACME exercise will take place in or near Road Runner, Tunnel Province, during the period 1 to 14 October. Although no one piece of information pointed directly to this conclusion, all pieces of information seemed consistent with each other as well as to the conclusion.

Pragmatic Test of Truth

This test proposes that a given statement is true if it works in practice.

A practical tool, the pragmatic test of truth has some weaknesses. First, the results may only appear to justify the means used to achieve them. Second, a successful outcome may be attributed to other factors that could have produced the same outcome. In the Admiral Scott example, the use of radar-controlled guns may have produced the same result no matter what formation was used. Lastly, an unsuccessful outcome does not necessarily imply that the means used were unsound; again, other unknown factors may have contributed to the unsuccessful outcome.

Example: Pragmatic Test of Truth.

Prior to the Battle of Cape Esperance in World War II, Admiral Norman Scott organized a task force into a long, single column. Admiral Scott believed this line-ahead formation would be effective against the Japanese units' night tactics. In the ensuing battle, Scott sank two Japanese destroyers and severely damaged two cruisers. After the battle, Admiral Scott concluded the original line-ahead formation theory was indeed effective. By combining radar-controlled fire control systems with line-ahead formation, Admiral Scott believed any night battle could be mastered.

SECTION III. PITFALLS OF ANALYSIS

The application of logic and reasoning is a mental process that is subject to numerous influences. Intelligence analysts involved in discerning facts, inferences, and conclusions are prone to the influences that shape and mold their view of the world and their ability to reason. These influences are referred to as pitfalls of analysis. To minimize their impact, analysts must be able to recognize these pitfalls in their own analysis and the analysis performed by others. Logical

fallacies and biases are two general categories of analytical pitfalls.

Logical Fallacies

Logical fallacies are errors in the reasoning process caused by the failure to apply sound logic. Though usually committed accidentally, these fallacies are sometimes used deliberately to persuade, convince, or deceive. Omission and assumption are two categories of logical fallacies.

Omission

Fallacies of omission leave out something important. The argument may omit a consideration of many cases; it may omit a consideration of a hypothesis that would account for the same conclusion; or it may omit something unfavorable to the argument. Fallacies of omission can occur in many forms.

Oversimplification

Oversimplification is a generality that fails to adequately account for all the complex conditions bearing on a problem.

Example 1: Oversimplification.

"Air power and the M1A1 tank won the Gulf War." This statement ignores the fact that the attack aircraft and the M1A1 tank were only two of many weapons systems and other capabilities used to provide critical support and ultimate success during the Gulf War.

Oversimplification results when one or more of the complex conditions pertaining to a certain situation are omitted and includes—

- Ignoring facts.
- Using generalities.
- Applying an inadequately qualified generalization to a specific case.

Example 2: Oversimplification.

An ordnance specialist inspecting a captured, hand-carried, surface-to-air missile launcher concludes that the threat has no effective low-level air defense. The assessment is based on the fact that the launcher is equipped with antiquated guidance mechanisms. The ordnance specialist's conclusion omits the following considerations:

- That the launcher was planted by the threat to give a misleading picture of their true capabilities.
- That the threat abandoned the launcher because it was ineffective and more capable systems were available.
- The weapon may have been deliberately doctored to mislead weapons experts.

Other weapons (e.g., antiaircraft artillery, small arms) can be very effective in some situations.

Hasty Generalization

Conclusions drawn from samples that are too few or from samples that are not truly representative are hasty generalizations.

Example: Hasty Generalization.

After interrogating an enemy prisoner of war (EPW), the interrogation officer reports the threat's morale as extremely low and that surrender is imminent.

In this case, the interrogator is making a hasty generalization because the sample population considered (one EPW) is too small.

Composition

The fallacy of composition is erroneously reasoning from the properties of a single entity to properties of a group.

Example: Composition.

During a skirmish with a Viet Cong battalion, a single EPW was captured. This EPW was suffering from malaria, malnutrition, and low morale. It was noted that the EPW was equipped with a semiautomatic weapon of World War II vintage. After a brief interrogation, the intelligence analyst reported the enemy battalion recently engaged was starving, diseased, and poorly armed.

The intelligence analyst failed to consider that—

- Only one prisoner was captured because he was too sick to keep up with the rest of the battalion.
- The weapon of early vintage did not necessarily make it ineffective.
- Few captured prisoners have high morale; in fact, low morale could just as easily result from being captured as it could contribute to being captured.

In this example, besides falling prey to hasty generalization, the analyst also demonstrated the fallacy of composition by applying the properties of a single prisoner to an entire enemy unit.

Division

The fallacy of division erroneously assumes that the characteristics of a group exist in every member of that group.

Example: Division.

Members of the threat guard's brigade had never surrendered in previous combat. After a recent engagement, an EPW stated he was a member of the guard brigade. The interrogator doubted the EPW's statement because personnel from that brigade never surrender.

In this example, the interrogator committed the error of division by assuming that since no guard brigade personnel had ever surrendered, the EPW could not be from that brigade. The analyst took the characteristics of a unit and uniformly applied them to every member of that unit.

Special Pleading

In special pleading, only one side of an argument is presented.

Example: Special Pleading.

At the conclusion of a staff study, the staff members, who are proponents of the proposed COA, are directed to list the pros and cons of the proposal.

Arguments for the proposal:

- Job requires little to no increase in manpower.
- Job can save the Government 2 million dollars.
- Risk to personnel is minimal.
- Equipment is readily available.
- Little special training is required.

Arguments against: None.

By omitting arguments against the COA, the staff committed the fallacy of special pleading. This fallacy also arises when the many interacting forces that give rise to a situation (i.e., cause and effect) are ignored.

Post Hoc

In the fallacy of *post hoc* ergo *propter hoc* (before the event, therefore caused the event), consideration of other factors that might have accounted for the same result are omitted. Post hoc fallacies often occur when trying to establish cause and effect.

Exa.nple: Post Hoc.

An aircraft equipped with a new jamming pod was not fired on while flying over threat-controlled territory. It was concluded that, since the aircraft was not intercepted or fired upon, the jamming pod was extremely effective in suppressing threat electronic systems.

The conclusion may or may not account for the aircraft not being attacked. Other considerations include—

- The threat was obtaining electronic intelligence on this new pod.
- The threat recently relocated several surface-to-air missile units and did not want to reveal their new positions.

False Dilemma

The fallacy of the false dilemma omits consideration of more than two alternatives.

Example 1: False Dilemma.

"Either we attack at dawn or the enemy will be too strong."

The two words that generally warn of a potential false dilemma fallacy are "either" and "or." False dilemmas exclude middle alternatives and consider only options of two extreme positions.

Example 2: False Dilemma.

An intelligence staff officer reports to the commanding officer that the enemy has only the capability to either defend in place or retreat. The intelligence officer committed the fallacy of false dilemma by failing to anticipate or ignoring that the enemy could—

- Attack if they were willing to accept high casualties.
- Withdraw to an alternate defensive position.
- Conduct a delaying action.

Assumption

Fallacies of assumption relate to begging the question, stating hypotheses contrary to fact, poisoning the well, and misusing analogies. All of these fallacies implicitly or explicitly involve assumptions, which may or may not be true.

Begging the Question

This fallacy occurs when a speaker gives what is assumed to be a legitimate response to a question but it is merely a rephrase of the question.

Example 1: Begging the Question.

When asked why the enemy was not pinned down by fire, the platoon leader replied: "Our suppressive fire was inadequate."

The fallacy in this response is that by definition suppressive fire pins down the enemy or is intended to pin him down. Since the platoon failed to pin down the enemy, the inadequacy of this fire was self-evident.

Example 2: Begging the Question.

A pilot reporting to a debriefing officer stated: "In response to your questions about whether or not all of my bombs landed on target, I'd like to say that as soon as I completed my pass there were two large secondary explosions."

The pilot begs the question by shifting attention from the primary issue to a secondary one. The response did not address the question that was asked.

Stating Hypotheses Contrary to Fact

This fallacy occurs when someone states decisively what would have happened had circumstances been different. Such fallacies involve assumptions that are either faulty or simply cannot be proven.

Example: Hypotheses Contrary to Fact.

If we had not supported Castro in his revolutionary days, Cuba would be safe for democracy today.

Besides being a gross oversimplification, the assumption made in the statement cannot be verified.

Poisoning the Well

This fallacy seeks to discount evidence before it is presented, most often by discrediting the source.

Example 1: Poisoning the Well.

An ardent spokesman against the value of strategic bombing states: "You can't trust that man's testimony regarding the effectiveness of strategic bombing; he's employed by the Air Force."

The speaker is trying to discredit contrary evidence by creating the specific impression that the testimony is biased because the testifier represents a certain organization.

Example 2: Poisoning the Well.

One intelligence analyst says to another analyst engaged in pilot debriefs: "Be careful with this man; it is his first mission."

This statement intends to discredit evidence before it is presented. It pleads against the subject by assuming that the pilot's lack of experience will result in bad information.

Misusing Analogies

Analogies are strong tools that can impart understanding in a complex issue. In the absence of other evidence, intelligence analysts may reason from analogy. Such reasoning assumes that the characteristics and circumstances of the object or event being looked at are similar to the object or event in the analogy. The strength of a conclusion drawn from analogy is proportional to the degree of similarity between two objects or events. The danger in reasoning from analogy is assuming that because objects, events, or situations are alike in certain aspects, they are alike in all aspects.

Conclusions drawn from analogies are inappropriately used when they are accepted as evidence of proof. Situations may often be similar in certain aspects, but not in others. When one generalizes indiscriminately from analogy to real world, this is misusing analogies. One method for weakening an analogous argument is by citing a counteranalogy. A counteranalogy weakens the original analogy by citing other comparisons that can be made on the same basis.

Biases

A subjective viewpoint, bias indicates a preconceived notion about someone or something. Although biases interfere with successful analytic thinking, they can have a positive influence on analysis. With a lack of information, a preconceived notion can give the analyst a starting point for thinking about a situation. However, biases generally have a detrimental impact because they obscure the true nature of the information. Intelligence analysts must be able to recognize cultural, organizational, personal, and cognitive biases and be aware of the potential influence they can have on judgment.

Cultural

Americans see the world in a certain way. The inability to see things through the eyes of someone from another country or culture is cultural bias. Biases interfere with the analyst's ability to think the way an enemy commander might think or to give policymakers informed advice on the likely reaction of foreign governments to American policy. Also known as mirror imaging, cultural bias attributes someone else's inten-

cultural bias attributes someone else's intentions, actions, or reactions to the same kind of logic, cultural values, and thought processes as the individual analyzing the situation. Although cultural bias is difficult to avoid, the following measures can lessen its impact:

- Locate individuals who were born or raised in the analyzed country or culture and—
  - Include them in the analytical process.
  - Ask their opinion about likely responses to friendly actions.
  - Take care when using their opinions, since they may be subject to biases regarding ethnic groups or cultures in the region and their knowledge may be dated or inaccurate.
- Locate regional experts such as foreign area officers and regional area officers who have lived or traveled through the area and are somewhat conversant regarding the culture. Assess the quality of the information provided against the level of knowledge and experience the individual has for that culture or region.

Organizational

Most organizations have specific policy goals or preconceived ideas. Analyses conducted within these organizations may not be as objective as the same type of analysis done outside the organization. Groupthink and best case are organizational biases that can affect subjective internal analysis.

Groupthink

This bias occurs when a judgment is unconsciously altered because of exposure to selective information and common viewpoints held among individuals. Involving people outside the organization in the analysis can combat this bias.

Best Case

This bias occurs when an analyst presents good news or bad news in the most optimistic light. The judgment is deliberately altered to provide only the information the commander wants to hear. Analysts can avoid this bias by having the moral courage to tell the commander the whole story, good and bad.

Personal

Personal biases stem from past experiences. If a thought pattern previously led to success, the analyst tends to follow that pattern. Even if the situations have nothing in common, the tendency to follow past successful methods is very strong.

Cognitive

The all-source intelligence analyst evaluates information from a variety of sources (e.g., HUMINT, SIGINT, IMINT, open source). The degree of reliability, completeness, and consistency varies from source to source and even from report to report. This variance often creates doubt about the reliability of some sources. Cognitive biases that affect the analyst include vividness, absence of evidence, oversensitivity to consistency, persistence of impressions, dependence on memory, and acceptance of new intelligence.

Vividness

Clear and concise or vivid information has a greater impact on analytical thinking than abstract and vague information. A clear piece of information is held in higher regard than a vague piece of information that has more value as evidence. Analysts must consider that an enemy may use deception to portray vivid facts, situations, and capabilities that they want the friendly intelligence effort to believe.

Absence of Evidence

Lack of information is the analyst's most common problem, especially in the tactical environment. Analysts must do their best with limited information and avoid holding back intelligence because it is inconclusive. To avoid this bias, the analyst should—

- Realize that information will be missing.
- Identify areas where information is lacking and consider alternative hypotheses.
- Adapt or adjust judgments as more information becomes available.
- Consider whether a lack of information is normal in those areas or whether the absence of information itself is an indicator.

Oversensitivity to Consistency

Consistent evidence is a major factor for confidence in the analyst's judgment. Information may be consistent because it is appropriate, or it may be consistent because it is redundant, is from a small or biased sample, or is the result of the enemy's deception efforts. When making judgments based on consistent evidence, the analyst must—

- Consider if the evidence represents all available information and intelligence. If it does not, or if it is not known, then the confidence level will be low, regardless of the consistency.
- Be receptive to information that comes in from other sources regardless of whether it supports the hypothesis or not.
- Be alert against confirmatory circular reporting, which is intelligence already obtained by the unit that is then reformatted by other units and intelligence organizations, modified slightly, and disseminated back to the unit.
- Know, to the degree possible, the original source for all intelligence to ensure that a circular report is not used as confirmatory evidence for an intelligence estimate or conclusion.

Persistence of Impressions

When evidence is received, there is a tendency to think of connections that explain the evidence. Impressions are based on these connections. Though the evidence eventually may be discredited, the connection remains and so do the impressions.

Dependence on Memory

The ability to recall past events influences judgment concerning future events. Since memory is more readily available, it is easy to rely on memory instead of seeking a proper sample to predict events.

Acceptance of New Intelligence

Often newer intelligence reports are valued more than older intelligence reports, which can occur when the intelligence collectors or sources are different.

Example: New versus Old Intelligence.

A ground reconnaissance team reports at 1300 that an enemy mechanized column is moving along a line of communications (LOC) at a given speed and direction. Later, at 1325, an AV-8B in-flight report indicates that the enemy column is moving along a different LOC.

In such cases, the newer intelligence report should be assessed against the full tactical context, and not simply its timeliness, to preclude incorrect intelligence interpretations.

Using the above example, follow-on coordination with the better situated ground reconnaissance team, capable of observing the same LOC and enemy targets for a greater period of time, may lead to a very different intelligence interpretation.

SECTION IV. DECISIONMAKING

One aim of intelligence analysis is to allow the commander to make timely and informed decisions by providing the right elements of available information at the right time and place. Gaining more information can reduce uncertainty, but a decrease in uncertainty occurs at the expense of time. Uncertainty and time always influence the commander's analytical and intuitive decisionmaking ability.

Analytical

In analytical decisionmaking, several options for solving the problem at hand are identified, studied, and compared to arrive at the best solution. Basically, comparing multiple options concurrently produces the optimal solution. This approach to decisionmaking tends to be methodical and time-consuming.

Intuitive

In intuitive decisionmaking, the commander assesses the situation in an effort to recognize a pattern; once a pattern is identified, experience and judgment guide the commander in evaluating the key elements of the problem and rapidly determining a satisfactory solution. The intuitive approach focuses on situation assessment instead of on the comparison of multiple options. Generally much faster than analytical decisionmaking, intuitive decisionmaking aims at finding the first solution that will satisfactorily solve the problem.

Comparison

Each analytical and intuitive decisionmaking approach has strengths and weaknesses. Although conceptually distinct, the two are rarely mutually exclusive. Intelligence supports analytical decisionmaking by helping to identify available options and by providing the estimates and studies for comparisons of those options.

Intelligence supports intuitive decisionmaking by providing the knowledge that helps the commander recognize emerging patterns. The process of intelligence analysis employs both analytical and intuitive decisionmaking to arrive at the conclusions presented to the commander. The IPB process, particularly if the various types of products are prepared in detail, is a distinctly analytical process. The decision support template derived from the IPB process, however, is a tool that facilitates intuitive decisionmaking. Generally, the analytical approach conforms well to the prehostility or contingency planning phase, while the intuitive model is usually more appropriate during execution of tactical operations.

The challenge for the intelligence analyst is knowing how much and what kinds of information the commander requires. Too much information may only confuse an intuitive decisionmaker and information requirements will change continually. Too little information for an analytical decisionmaker may result in procrastination and the continual demand for more information. The key to overcoming these challenges is a solid understanding of the commander, constant interaction through training and exercises, and a well developed process for identifying information requirements.

CHAPTER 5. INTELLIGENCE PREPARATION OF THE BATTLESPACE

An analytical methodology, IPB is employed during operations to identify, assess, and reduce the effects of enemy, environment, and terrain uncertainties on friendly and threat forces. The IPB process analyzes the threat and environment in a specific geographic area to determine and evaluate the threat's capabilities, vulnerabilities, and probable COAs. Designed to support staff estimates, planning, and decisionmaking, IPB results are incorporated into the intelligence estimate, which provides knowledge-based intelligence that can be visualized and absorbed by decisionmakers. See appendix A for a detailed outline of the intelligence estimate format. The formatted graphics and images provided through the IPB process help the commander to rapidly visualize, assimilate, and apply intelligence in the decisionmaking process. This enhances the commander's ability to discern patterns as they emerge and to conduct recognitive or intuitive decisionmaking, thereby increasing operational tempo.

Operations and intelligence must have a common focus to successfully apply the interactive IPB process. See FM 34-130/Fleet Marine Force Reference Publication (FMFRP) 3-23-2, *Intelligence Preparation of the Battlefield*, for a detailed discussion of the IPB process.

The IPB requirements for a humanitarian assistance operation differ significantly from a combat operation against a conventional armed force. In a given situation, a unit or staff section may prepare some or all IPB products. Determining which products to prepare and identifying their relative priority depends on the factors of METT-T and command guidance.

The IPB process develops tailored, mission-focused, knowledge-based intelligence that is incorporated into a variety of intelligence products. Intelligence preparation of the battlespace provides intelligence in graphic and image formats that help the commander rapidly visualize, absorb, and apply the intelligence in the decisionmaking process. Numerous standard overlays and graphics are associated with the IPB process; however, each situation is unique. A modified combined obstacle overlay and threat doctrinal template that support conventional operations may be of limited use in military operations other than war (MOOTW). The type of products generated as a result of IPB vary based on the—

- Size of the unit.
- Time available.
- IRs.
- Characteristics of the mission and AO.

The IPB process defines the battlespace environment, describes the battlespace effects, evaluates the threat, and determines threat COAs. These steps are discussed in this chapter and remain constant regardless of the type of mission or size of the staff section; however, the application of the steps varies with each situation. This chapter also goes into detail about the decision support template and discusses the abbreviated IPB process.

SECTION I. STEP 1—DEFINE THE BATTLESPACE ENVIRONMENT

The first step of the IPB process identifies the physical space and specific features of the environment or activities that may influence friendly and enemy COAs and commander's decisions. When defining the battlespace environment, intelligence analysts conduct the following procedures.

Identify Significant Characteristics of the Environment

Characteristics of the battlespace environment that will influence the commander's decisions or affect the COAs available to friendly forces or the threat are of special significance. During a humanitarian assistance operation, for example, the location and activities of civilian relief organizations might be a significant characteristic of the battlespace. During support to counterdrug operations, significant characteristics might include narcotics production or weapons trading. During a conventional war, typical characteristics may include location and activities of enemy reserves, reinforcements, and long-range fire support. When identifying significant characteristics of the battlespace, intelligence personnel consider threat forces and other aspects of the environment that may have an effect on accomplishing the unit's mission. Depending on the situation, these environmental aspects may include—

- Geography (e.g., area terrain and weather).
- Population demographics (e.g., ethnic groups, religious groups, age distribution, income groups).
- Political or socioeconomic factors (e.g., the role of clans, tribes, gangs).
- Infrastructures (e.g., transportation, telecommunications).
- Rules of engagement or legal restrictions (e.g., international treaties, agreements).
- Threat forces and their capabilities (e.g., paramilitary and unconventional forces).

Initially, each environmental characteristic is examined in general terms to identify its significance to the command and its mission. Identifying the significant characteristics of the battlespace environment helps establish the geographical limits of the AOI and directs analytical efforts in steps 2 and 3 of the IPB process. It also helps identify uncertainties or gaps in the type of information and intelligence required to complete the IPB process and answer the PIRs and IRs (see fig. 5-1).

Identify the Command's Area of Operations and Battlespace Limits

The AO represents an area assigned to a commander with authority and responsibility for the conduct of operations (see fig. 5-2). The limits of the AO are normally the boundaries specified in the OPORD or higher headquarters execute order that defines the command's mission.

Area of Influence

This is the geographical area where a commander is able to influence operations through C2 of maneuver or fire support systems. Based on the range of organic or supporting weapon systems, the area of influence may extend beyond the AO.

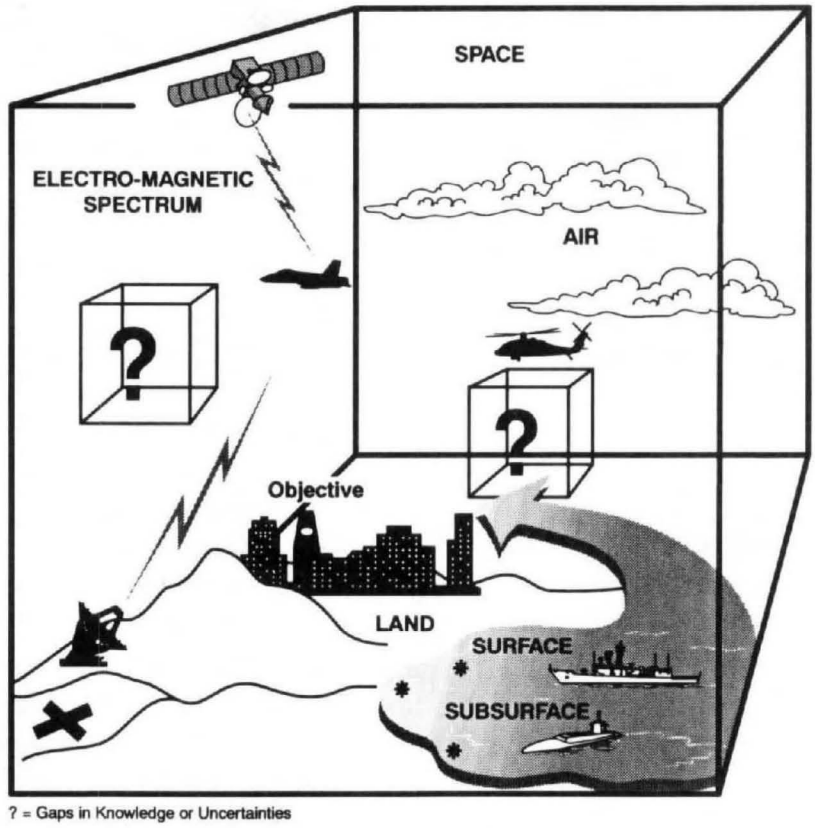

Figure 5-1. Battlespace Examination.

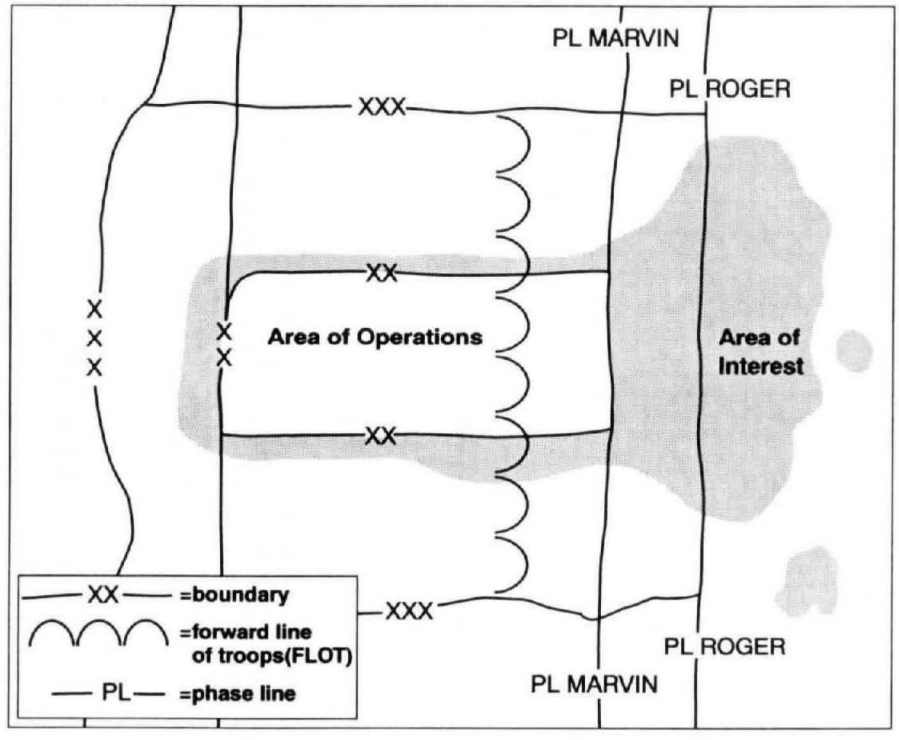

Figure 5-2. AO and AOI.

Area of Interest

The commander selects the AOI based on the estimate of the situation. The dimensions are not constrained by the organic ability to acquire information on that area. The AOI must extend, in as irregular a shape and as far as needed, in all directions to safeguard the command from surprise (see fig. 5-2). The AOI must be viewed in terms of width, depth, height or airspace, and time.

Battlespace

The battlespace is all aspects of air, surface, subsurface, land, and space, as well as the electromagnetic spectrum, the information environment, and other dimensions which encompass the AO, the area of influence, and the AOI. Figure 5-3 depicts many of these battlespace dimensions and factors.

Establish the Area of Interest Limits

The AOI is the geographical area from which information and intelligence are required to permit planning or successful conduct of the command's operation. The command's AOI is generally larger than its AO. The limits of the AOI include each of the characteristics of the battlespace environment identified as exerting an influence on potential COAs or command decisions.

The limits of the AOI are based on the ability of the threat to influence the accomplishment of the command's mission. The geographical locations of other activities or characteristics of the environment that might influence COAs or the commander's decision and the resulting changes in the command's battlespace must be considered when establishing AOI limits.

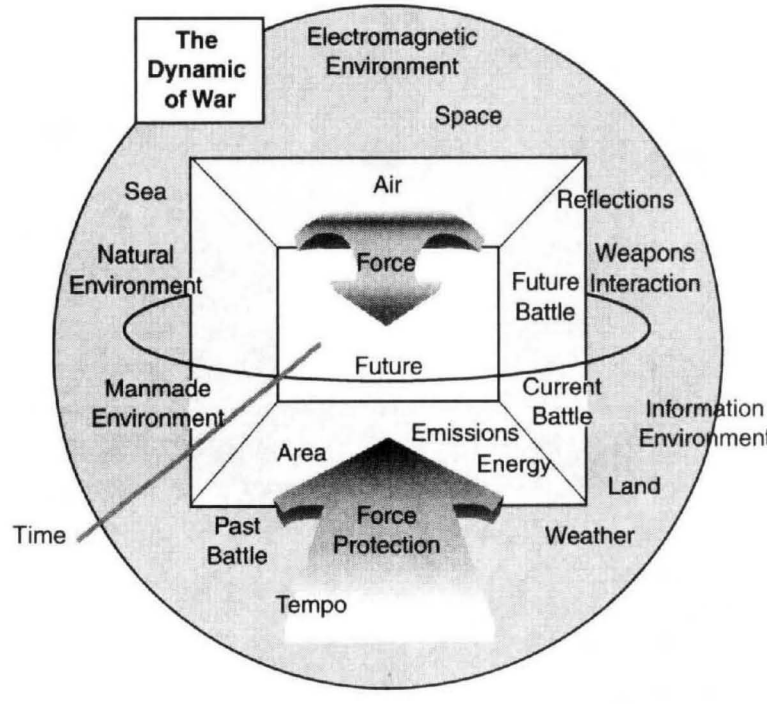

Figure 5-3. Battlespace Dimensions and Factors.

Areas of interest can be divided into several components (e.g., ground, air, political). Altitude must be considered in the air AOI when the projection of air power is of interest. When an air defense-related IPB is conducted, the AOI should extend upwards to the maximum service ceiling of the threat's aircraft. When an aviation-related IPB is conducted, the AOI should extend to the maximum service ceiling of friendly aircraft or the maximum effective altitude of threat air defense systems, whichever is greater. When space-based IPB is conducted, the AOI must extend to the maximum effective altitude of relevant space-based systems. Although AOIs may be developed separately, at some point they must be considered as an integrated whole.

One of the primary considerations in establishing the limits of the AOI is time. The time limit is based on the threat's ground and air mobility and the amount of time needed to accomplish the friendly mission. For missions of relatively short duration, such as the evacuation of noncombatants or raids, the AOI may be relatively small and usually includes only immediate, direct threats to mission accomplishment. A helicopter raid where the MAGTF has air superiority might have an AOI that includes only air defense systems within the range of the engagement area and the air routes. Some long-term missions, such as peacekeeping, will result in an extensive AOI that considers political, economic, and conventional military factors.

Since the limits of the AOI are based on threats to mission accomplishment rather than strictly terrain considerations, the limits may cross into neutral countries. If developments in a neutral country might influence accomplishment of the unit's mission, that country must be included in the AOI.

Identify the Detail Required for the Time Available

The time available for completion of the IPB process may not permit the luxury of conducting each step in detail. The focus must be on the parts of IPB that are most important to the commander in planning and executing the mission. Identifying the amount of detail required avoids wasting time on developing more detail than necessary in each step of the process. For example, the situation may require detailed threat analysis only on selected areas within the command's AO based on the assigned mission or other METT-T factors. Some geographical areas or threat forces within the AO may require only a summary type evaluation of their effects or capabilities.

Evaluate Existing Intelligence Data Bases and Identify Intelligence Gaps

Data bases may only contain some of the intelligence and information required to evaluate the effects of each battlespace characteristic and each threat force. This is especially true of the majority of countries where the MAGTF may conduct operations in the future. Identifying the intelligence gaps early allows the intelligence analysts to initiate action required for collecting intelligence and filling the gaps, to perform the necessary production, and to disseminate the intelligence products in a timely manner. When evaluating existing data bases, intelligence analysts must—

- Identify and prioritize the intelligence gaps in current holdings, using the commander's PIRs and intent to set the priorities.
- Identify any gaps that cannot be filled within the time allowed for IPB.
- Inform the commander and operators of unfilled gaps so that reasonable assumptions can be formulated.

Collect the Required Intelligence and Materials

Ideally, intelligence operations enable the analyst to develop estimates of the battlespace and the threat that match the actual situation. In reality, intelligence will never eliminate the unknown aspects or uncertainties that concern a commander and staff. Intelligence analysts must be prepared to fill in the gaps with reasonable assumptions and estimates. When collecting the required intelligence and materials, intelligence analysts must—

- Initiate collection or requests for intelligence to fill the gaps and to conduct IPB.
- Prioritize collection against all identified significant characteristics of the battlespace.
- Initiate action on identified IPRs and continuously update the IPB products as additional intelligence is received.
- Inform the commander as assumptions are confirmed during the initial mission analysis and IPB process.
- Re-examine the evaluations and decisions on which proven invalid assumptions were based.

SECTION II. STEP 2—DESCRIBE THE BATTLESPACE EFFECTS

The second step in the IPB process is to determine how the battlespace environment affects both threat and friendly operations. This evaluation step begins with an analysis of existing and projected conditions of the battlespace environment and determines how those conditions will affect friendly and threat operations and broad COAs. Intelligence analysts describe the battlespace effects by analyzing the battlespace environment, such as terrain, weather, and other battlespace characteristics, and by describing the battlespace effects on threat and friendly capabilities and broad COAs.

Analyze the Battlespace Environment

The degree of detail in the analysis varies depending on the area of the battlespace environment being evaluated. Generally, the AO is evaluated in more detail than the AOI. Additionally, the focus varies throughout each area. For example, rear areas within the AO may require a different focus than areas near the main battle area. Certain areas or subsectors affect various types of operations to varying degrees. During the evaluation, intelligence analysts must identify areas that favor each type of operation (e.g., offensive, defensive, force protection, peace enforcement). Terrain, weather, and other characteristics of the battlespace are analyzed as part of the IPB process.

Terrain

Terrain analysis is the means to determine which friendly COAs can best exploit the opportunities the terrain provides and how the terrain affects the threat's available COAs. The best terrain analysis is based on a reconnaissance of the AO and AOI. Analysts must identify gaps in knowledge of the terrain that a map analysis cannot satisfy and use the identified gaps to guide reconnaissance planning and to focus on areas most important to the commander and the mission.

The members of intel bn's topographic platoon usually conduct the major portion of the terrain and hydrographic analysis and development of supporting GEOINT products. They also receive

support from Army topographic units operating as part of or in support of the joint force. Topographic personnel work closely with weather personnel and weather analysts to ensure that terrain analysis incorporates the effects of current and projected weather events.

The National Imagery and Mapping Agency (NIMA) produces specialized maps, overlays, and automated data bases for specified areas of the world to aid in map-based evaluations. The tactical terrain analysis data base consists of selected terrain information that is limited to natural and manmade features of tactical military significance, which can be exploited by terrain analysts to satisfy military requirements. Specialized NIMA products address—

- Cross-country mobility.
- Transportation systems (road and bridge information).
- Vegetation type and distribution.
- Surface drainage and configuration.
- Surface materials (soils).
- Ground water.
- Obstacles.

Terrain analysts must ensure that the analysis includes the effects of existing and forecasted weather on the military aspects of the terrain, because changes to the battlespace environment may change the terrain analysis evaluation results. Analysts express the results of evaluating the terrain's effects by identifying areas of the battlespace that favor, disfavor, or do not affect each broad COA. These conclusions are reached through analysis of the military aspects of the terrain and evaluation of the terrain's effects on military operations.

Analyze the Military Aspects of the Terrain

Terrain analysts evaluate the following military aspects of terrain to determine the effects on military capabilities:

- Key Terrain—Any locality or area (natural or manmade) that the seizure, retention, or control of will afford a marked advantage to either combatant.
- Observation and Fields of Fire—Observation is the ability to see the threat either visually or through the use of surveillance devices. Fields of fire are areas that a weapon may effectively cover with fire from a given position.
- Cover and Concealment—Cover is protection from the effects of direct and indirect fires. Concealment is protection from observation. Ditches, caves, river banks, folds in the ground, shell craters, buildings, walls, embankments, woods, underbrush, and other natural or manmade features can provide cover and/or concealment.
- Obstacles—Any natural or manmade feature that stops, impedes, slows, or diverts military movement.
- Avenues of Approach and Mobility Corridors—Avenues of approach (AAs) are air, sea or ground routes of an attacking friendly or threat force of a given size leading to its objectives or to key terrain in its path (see figs. 5-4 below and 5-5 on page 5-8). Mobility corridors are areas where a force will be

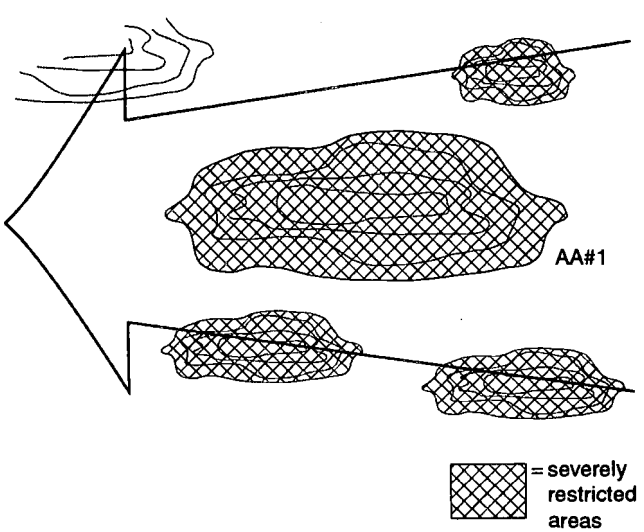

Figure 5-4. Regimental Ground AA.

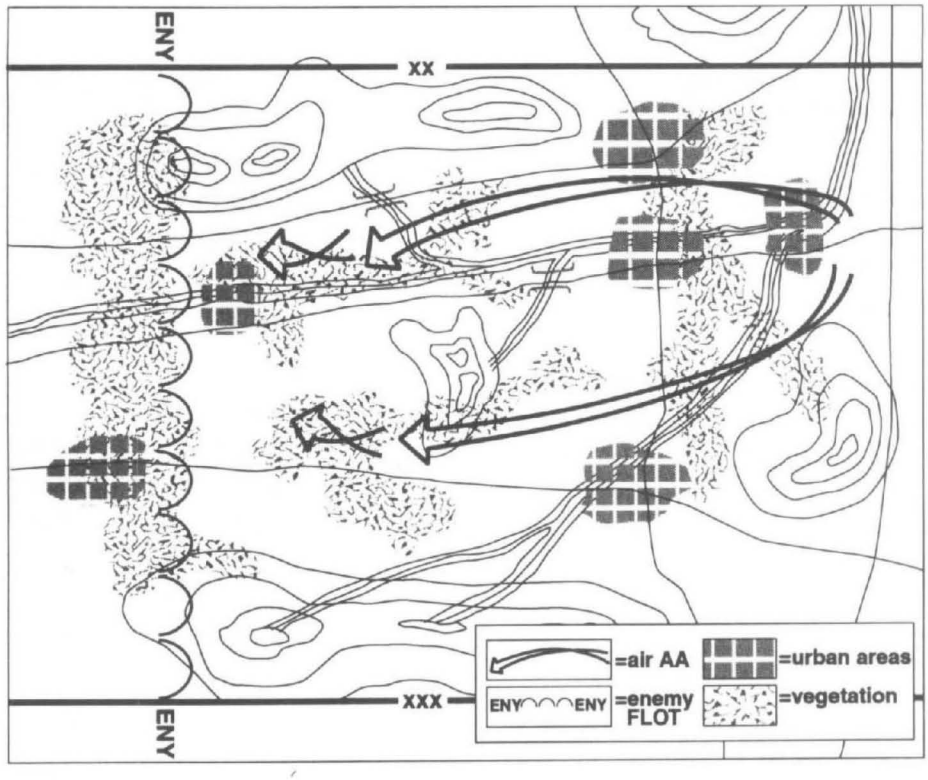

Figure 5-5. Air AAs Overlay.

canalized due to terrain restrictions. A mobility corridor is relatively free of obstacles and wide enough for maneuver of tactical formations, which allows military forces to capitalize on the principles of mass and speed. When grouped together, mobility corridors constitute an AA (see fig. 5-6). Based on previous terrain analyses, the analyst determines how the terrain will allow maneuver to objectives. Analysts must consider littorals/waterways (e.g., beaches, rivers) as possible mobility corridors and AAs.

Evaluate the Terrain's Effects on Military Operations

Terrain analysts evaluate the terrain's effects on friendly and threat offensive and defensive COAs by identifying the areas along each AA best suited for use as potential—

- Engagement areas and ambush sites—Using results of concealment and cover evaluation, terrain analysts identify areas where maneuvering forces are vulnerable to fires. They consider ranges of weapons, flight times of missiles, and the likely speed of maneuvering forces. If the unit is attacking, analysts identify areas where the unit will be vulnerable to threat fires. If the unit is defending, analysts identify potential engagement areas (see fig. 5-7).
- Battle positions—These positions may be used by friendly attacking forces to block enemy counterattacks. Terrain analysts identify concealed and covered positions that offer observation and fields of fire into potential engagement areas. If a command is defending, these positions are potential defensive positions; if a command is attacking, the positions provide a start point for determining possible threat COAs.