

Chapter 5

OPEN SOURCES AND MILITARY CAPABILITIES

5001. Purpose of the Chapter

This chapter focuses on the practical application of open sources to military intelligence analysis requirements.

We will begin by introducing a model for integrated all-source analysis which illustrates the critical importance of geographic and civil factors in evaluating the threat at each of the levels of analysis. While open sources are useful in conducting research and developing intelligence estimates about military capabilities in isolation, open sources are most useful to the military intelligence analyst when used to develop a broader analytical model.

The general utility of open sources for military intelligence analysis, and the specific utility of open sources at the strategic, operational, tactical, and technical levels of analysis will be discussed.

Next we will look at specific private sector capabilities for collecting and processing open source information. Commercial imagery, private sector order of battle information, and networks of experts available for consultation will be reviewed in general terms.

Finally this chapter introduces the student to the Expeditionary Factors study developed by the Marine Corps Intelligence Activity, and used for this class because it is the only current and authoritative intelligence analysis product which relies exclusively on open sources, is unclassified in its final form, and covers a broad range of mission area factors for eighty countries specifically chosen because of the likelihood that a Marine Air Ground Task Force will be engaged in non-combatant or combatant missions in the countries

There are three Appendices associated with this chapter--Appendix A, which was introduced in Chapter 1, and Appendices F-1 and F-2.

5002. Model for Integrated All-Source Analysis

The four levels of analysis first popularized and thoroughly explained by Edward N. Luttwak in his book, *STRATEGY: The Logic of War and Peace* (Belknap, 1987), are most easily understood with an illustration. The Marine Corps Intelligence Center expanded this model by distinguishing between military, geographic, and civil factors. The third hand-out is a complete description of the model, including a summary illustration on page v.

When the model was first developed, a specific Middle Eastern country was used by the Marine Corps, in consultation with DIA, CIA, and NSA analysts responsible for that country, to test assumptions. Their tank warfare capability, traditionally assessed as a high threat, proved on examination through the four levels of analysis, to be a high threat only at the technical level, because the country had an inventory of T-72 tanks, the best tanks that money could buy at the time. At the tactical level of analysis, the threat dropped to low because the tanks were not being maintained, in fact were being cannibalized for parts, and the troops were not trained. At the operational level, the tank threat increased to medium because there were a significant number of tanks available around the country. Finally, at the strategic level of analysis, the tank threat again dropped to low because it was not possible for the country to sustain tank operations for very long.

This analytical model becomes even more useful when we introduce the three analysis domains--military, geographic, and civil--and consider how the three domains interact at each level of analysis. At the strategic level, military sustainability, geographic location, and civil allies are the essential elements of employable power. At the operational level, military availability, geographic

resources, and civil instability bear on the regional influence of the target country. At the tactical level, military reliability, geographic terrain, and civil psychology come together to determine battlefield dynamics. Finally, at the technical level, military lethality (and accuracy), geographic atmosphere--specifically temperature--and civil infrastructure including communications and computing systems, help determine the balance of power.

In short, the threat varies depending on the level of analysis. Open sources provide both raw information, and a general context, for this more complex form of analysis.

5003. General Utility of OSINT

There are three major ways in which open sources are very useful to the defense intelligence analyst:

First, open sources are very quickly and cheaply available, and even when the full weight of the traditional classified capabilities are being brought to bear, will offer the analyst--and the supported policy maker or commander--a rapid orientation useful for planning purposes.

For example, in one case where U.S. forces were being directed to deploy quickly to a remote area of Turkey, it was an open source reference which quickly identified the nearest airfields and their runway, navigation, and bunkering capabilities.

In many cases, open sources may be the only available source for a significant period of time. As military operations other than war, and unanticipated contingencies, tend to occur in Third World countries that are Tier 3 or Tier 4 in terms of standing intelligence priorities, it will often be the case that the military intelligence analyst and the operating forces will be forced to rely exclusively on commercial imagery, private sector news broadcasts, and direct contact with overt human experts, in order to produce intelligence.

The second area where open sources have a significant value is with respect to collection management. By providing a rapid and inexpensive orientation, a "first cut" on what is known and what is not known, open sources has enable the analyst to develop a collection management strategy which avoids wasting precious classified resources of essential elements of information which can be handled by open sources, and which focuses the clandestine and technical capabilities on "the hard stuff".

Finally, open sources are very helpful when conducting joint or coalition operations, including support to law enforcement, where there are constraints on the sharing of classified intelligence, and it is considered prudent to avoid sharing sensitive intelligence and the means by which the intelligence was obtained.

5004. Strategic Intelligence

At the strategic level, military sustainability, geographic location, and civil allies are critical elements of national power. Much of the information needed at this level is in fact available through open sources.

In the indications & warning arena, open sources can--through the technique of content analysis and comparisons of content over time--provide very reliable gauges of national intent. In fact, the Office of Strategic Services and its original Research & Analysis Branch made the analysis of open sources an art form--by studying what the German leaders were telling their own people through the public media, the OSS was able to develop estimative intelligence.

Open sources are also critical in two areas traditionally not within the normal scope of classified systems--demographic intelligence and cultural intelligence. Today, as organizations such as the U.S. Information Agency begin to apply intelligence methods to open sources, and adopt a collection and reporting role in these areas (as was recently recommended to their oversight body, the U.S. Commission on Public Diplomacy--the analyst may find that one of their most important sources for partially analyzed open source information is the traditional consumer of intelligence.

Strategic generalizations are not yet a well developed aspect of national intelligence support to acquisition, but as the concluding chapters will demonstrate, a potentially important means of money and improving system performance. To take just one example: if aircraft are built to a standard "warm" day, and the "real world" of contingencies is in fact a "hot" world, then by definition our forces will be using aviation resources which can fly half as far and carry half as much as advertised when operating at the "optimal" temperature. When European truck manufacturers adopt a strict policy of never selling a vehicle weighing over thirty tons to a Third World county, the viability of some of our heavier ground combat vehicles must be called into question.

At the strategic level open sources are helpful in understanding the context for security assistance programs, and in developing support for specific programs from the public, the press, and the policy community.

5005. Operational Intelligence

At the operational level, military availability, geographic resources, and civil instability influence the regional effectiveness of individual countries.

It is very helpful for an analyst to develop regional generalizations, to establish an understanding of order of battle averages, and of geographic and civil constraints characteristic of the region. Third World operations are inherently different from the European theater operations against a Soviet threat for which most U.S. mobility and weapons systems were designed--the analyst that understand both the limitations of our own systems in the Third World, and the possible advantages which accrue to those fighting on their home ground with equipment designed for their home ground, will probably produce more useful intelligence products.

Open sources are especially valuable to the theater commander and those supporting the theater and its Joint Intelligence Center because most contingencies will not warrant major collection campaigns from classified sources. This is true both in the planning phase, and in the execution phase when it is necessary to coordinate logistics and other matters with joint and coalition partners. At the operational level, where the greatest mixture of allied and U.S. services is to be found, and there is a greater involvement of civilian agencies from both the U.S. and other countries, secrecy can be an impediment to understanding and consensus, and open sources can have a corresponding simplicity which increases cooperation and improves coordination.

As the theater staff plans the allocation of resources, a sound understanding of the region and the capabilities of all parties to the operation, largely gathered through open sources, can help determine what should be left on the pier, what additional capabilities are needed from the national level, and what to expect or request for allies.

5006. Tactical Intelligence

At the tactical level, military reliability, geographic terrain, and civil psychology are essential determinants of battlefield success.

At this level, where combined arms coordination at the 1:50,000 scale is essential to the art of maneuver and the control of precision munitions, commercial imagery is often the only available source which can be brought to bear. National collection capabilities are not well-suited for wide area surveillance, they were designed for point targets, and will naturally be much in demand for the development of target intelligence.

Commercial imagery, notably SPOT imagery at the 10 meter level of resolution (meaning you can see an object ten meters wide on the ground), is not only fully suitable for the creation of 1:50,000 combat charts with contour lines, but has also proven to be more than acceptable to the U.S. Air Force as the foundation for targeting precision munitions, and as the source for digital elevation data used to create sophisticated simulations for mission rehearsals and other needs.

It is important to note that commercial imagery requires the addition of "ground truth" points to orient the image and establish precise geo-spatial accuracy. Such precision is obtainable in two ways: through the integration of precision points (e.g. key intersections) obtained from the National Reconnaissance Office through the Defense Mapping Agency, or through Global Positioning Satellite (GPS) recordings taken by human assets actually on the ground.

Open sources are very useful in emerging target areas which have not been heavily covered by classified capabilities. The Director of the Non-Proliferation Center, for instance, has stated publicly as much as 80% of his final intelligence products are based on open sources; in counter-narcotics operations, open sources--including investigative journalism in Latin American newspapers--has proven to be accurate and comprehensive....so much so that the U.S. Southern Command enlisted the Department of Energy laboratories (Los Alamos and Sandia) to collect and process open source information from Latin America, with the result that tactical interdiction operations were mounted. This story is told in *SHARING THE SECRETS: Open Source Intelligence and the War on Drugs*.

5007. Technical Intelligence

At the technical level, military lethality (including accuracy), geographic atmosphere, and civil infrastructure are important determinants of battlefield success.

As was discovered during the Gulf War, open sources are the best and often the only source of information needed to "map" the target area's C4I infrastructure, and develop information warfare operations.

Open sources are also the backbone for planning logistics operations and mobility systems, since information about airheads, ports, rail and road networks, and related support systems are all a matter of public record. There is however, an aspect of the open source world that is not obvious at first: much of what is counted as "open" source is in fact grey literature, limited edition literature in a foreign language. Collecting and processing open source information is not necessarily easy!

Finally, open sources are the foundation for long-term intelligence efforts against scientific and weapons research. Unclassified civilian research, and publications by civilians employed in defense-related industries, have long been a critical foundation for intelligence in support of major acquisition programs. In fact, one tip-off for intelligence analysts is the disappearance from a literature of a particular expert, or a particular line of inquiry.

5008. Commercial Imagery for 1:50,000 Maps

A ten meter image from SPOT Image Corporation can be processed to integrate both the standard military grid lines, and the contour lines that most people do not realize is achievable from SPOT panchromatic coverage.

It is especially important for analysts to understand that this commercial system has been in operation for over a decade, and that virtually the entire world has been imaged, with most images being less than five years old and in ground station archives--this imagery is available within 24 hours.

Source imagery is not enough by itself, as was mentioned earlier. Additional processing is required to establish elevation points and precision points, and additional time is needed to produce the 1:50,000 combat charts necessary for combined arms operations and especially infantry patrolling....but the source imagery, traditionally the stumbling block when attempting to use national systems to obtain wide area coverage in a crisis, is no longer the obstacle to producing maps.

By combining SPOT wide area coverage with NRO precision points, under the management of the Defense Mapping Agency, we can have 1:50,000 maps right now.

5009. Commercial Imagery for Mission Rehearsal

The same commercial imagery that is used to produce 1:50,000 combat charts can also produce superb three-dimensional simulations and perspectives that can be used to study beach approaches, potential landing zones, and nape of the earth flight corridors.

5010. Order of Battle Information

The former Soviet Union and the People's Republic of China are probably the only two countries where the U.S. intelligence community could state with certainty that it possessed more accurate information about the order of battle than was available from open sources. Perhaps this is even true of other denied areas such as North Korea and Cuba.

Yet when it comes to virtually any other country, the information collected and processed by Jane's Information Group, publisher of the Jane's series of books and CD-ROMS which cover all types of mobility and weapons systems, is the world standard. In fact, in a graduate thesis by (then) Major Robert M. Simmons, titled "Open Source Intelligence: An Examination of Its Exploitation in the Defense Intelligence Community", our own military intelligence analysts are quoted as saying "reference publications such as Jane's often provide first indications of weapons modifications and sales" (page 112).

The Jane's series of references books and CD-ROMS is now also available online by special subscription, and the material is kept current by a global network of overt human assets as well as extraordinarily good relations between Jane's and most Ministries of Defense. Analysts need to know that as good as the Jane's publications are, only 20% of the information known to Jane's is actually made public. "Confidential" reports on training, morale, and other issues can be obtained by special arrangement.

Jane's is also helpful in understanding the order of battle for non-traditional information. Jane's has provided orders of battle for the warring clans in Somalia, and is considering providing a similar service with respect to transnational criminal organizations.

Another private sector service that can be helpful to analysts attempting to understand Third World or non-traditional orders of battle (e.g. of revolutionary groups) is offered by Rapport Research & Analysis, representative of a small number of elite organizations, most with Special Air Service or similar backgrounds, who specialize in making available highly trained interrogator-translators who are able to canvass refugee and exile communities to identify sources and then systematically develop the needed information as well as leads to in-country sources of potential value.

5011. Historical and Estimative Analysis

In the age of distributed information, the concept of "central intelligence" is difficult to implement, and even unnecessary. While a central coordinating authority, and bodies of trained analysts with clearances, are both needed, there is now a very robust "virtual intelligence community" which can be harnessed to develop significant amounts of historical and estimative analysis based solely on open sources.

Oxford Analytica, a U.S. owned company based in Oxford, England, is the best private intelligence agency in the world, and its excellence is based strictly on analysis. Founded by Mr. David Young, who worked with Dr. Henry Kissinger when the latter was National Security Advisor to the President, Oxford Analytica specializes in producing daily regional reports which concisely address three questions: what's right in the news that needs elaboration? what's wrong in the news that needs correction? and what weak signals are we seeing that merit scrutiny and an estimate?

This organization covers the world. For Somalia, to take one example, over a period of two years they produced over twenty two page reports on UN operations in Somalia, US foreign policy toward Somalia, and US operations in Somalia.

How does this "best in class" organization work? They start by having a fifteen person team, organized by region and function, review all news wires and major periodicals on a day to day basis. They then

bring in the Dons of Oxford in small groups rotated regularly, and draw on the expertise resident at Oxford University--in effect they have harnessed the centuries of accumulated experience, and integrated that experience into their daily operations. Then, when special reports are desired, they have a global network of 1,000 experts, culled down from 2,500, to whom they can turn at any time with a request for a two-page report which integrates personal calls to key decision-makers, and is drafted at a level suitable for a President, Prime Minister....or you, the analyst preparing intelligence products for policy-makers and commanders.

5012. Networks of Experts

The most significant difference between elementary and advanced analysis is that the first draws primarily on published information, and the second draws primarily on direct contact with world class experts.

Most published information is out of date by the time it is published. In addition, the intelligence community, which specializes in secrets, is not trained, equipped, and organized to collect open source materials. The result, well documented in the thesis by Major Simmons cited earlier, is that analysts have very limited access to the broad capabilities in the private sector. Advanced analysis requires recourse to a network of expert colleagues in the private sector who can serve as a collection filter, and quickly identify key documents, comment authoritatively on emerging trends, and generally help the advanced analyst to fully exploit open sources, while also adding the unique value that is inherent in all-source analysis.

LEXIS-NEXIS and DIALOG, the two major online news services, are recommended to analysts not for the massive volume of printed information they can provide, but for something far more subtle: the identification of journalists and sources who--through their by-lines or their being cited, might aid the analyst in leap-frogging over old published information and into the future.

Complementing the online services is the Institute of Scientific Information, and its two major publications, the *Social Science Citation Index* and the *Science Citation Index*. These are unique databases, available both in hard copy and online, because they allow the analyst to take an older work known to be relevant, and to quickly identify, right up to the current week, who has cited the older work. In essence, the analyst can quickly reach the most current and authoritative experts on any topic through this capability, with the added advantage that frequency of citation conveys a sense of peer evaluation.

Professional associations and associations of retired military personnel are mentioned simply to highlight the fact that the entire world is full of knowledgeable people, most of whom would be happy to respond to questions. Finding the right person and asking the right question is becoming more important than "keeping up with traffic".

5013. Expeditionary Factors Study

The *Expeditionary Factors* study sponsored by the Marine Corps Intelligence Activity and carried out by PRC under contract, is a second generation effort, and current as of 1994. It is a showcase for OSINT, as it is the only high-level intelligence community product that relies exclusively on open sources, and is published in an unclassified form (For Official Use Only).

The first generation study was completed in 1990, and was called *Overview of Planning and Programming Factors for Expeditionary Operations in the Third World*. Copies of the original analysis model, and of the strategic generalizations chapter from the original study (this chapter was inadvertently overlooked in the follow-on study and thus was not updated), are included as hand-outs.

The other unique aspect of the Marine Corps study was its focus on countries which the Marine Corps felt has the "highest probability" of requiring entry by U.S. forces, rather than on the traditional "worst case" priorities focus. The original list of countries, approved by the Marine Corps flag officer community, was comprised of 69 countries. The current list includes 80 countries, almost all of them in the Third World.

The Marine Corps approach, besides focusing on open sources and an unclassified product, was also unique in that warfighters--operators--were asked to define low, medium, and high degrees of difficulty for each mission area, and this was then converted into a five point scale that can be graphically depicted.

This three-volume hard-copy set, also available on CD-ROM, is an excellent ready reference for planning, and is available. To obtain ordering information, call or fax the numbers shown here.

5014. Strategic Generalizations

Having introduced the *Expeditionary Factors* study, we now turn to some of the strategic generalizations which emerged from its predecessor and remain constant today.

The expeditionary environment is complex and lethal. Experienced infantry, modern armor, sophisticated artillery, night/all weather aviation, and integrated air defense systems are all too often characteristic of the "Third World".

The "cultural terrain" is steep, with 40 of the original 69 countries speaking Arabic or a primary language other than English, French, or Spanish, and most practicing Islam or an eastern or trivial religion.

The aviation temperature is uniformly hot, with a sustained heat index of over 80 degrees, which automatically reduces both lift and range of aviation platforms significantly. There is an equal mix of mountains, deserts, jungle, and urban terrain. We must be ready for all four. Cross-country mobility was non-existent in 60% of the countries and severely constrained in another 20%. When combined with an average bridge loading capability of no more than 30 tons (not in the study but well-known as the civilian limit for truck weight), this suggests real difficulty for existing concepts of ground maneuver.

Average line of sight distance was under 1,000 meters, with only eight of the 69 countries offering stand-off engagement ranges of over 2,000 meters. In the absence of carrier aviation, the Navy's standard guns are no match for the coastal artillery and missiles of many of these countries.

There were no 1:50,000 maps for 22 of the countries, and old maps for ports and capital cities only of another 37 of the countries.

Finally, between half the countries having no usable ports, and most capital cities with their Embassies being beyond the round-trip range of a CH-46 flying from the five fathom line, Non-Combatant Evacuation Operations presented real challenges.

5015. Commission on Intelligence

Open sources are gradually being accepted as an important part of the all-source production process, but there are still many obstacles to its full integration into national and defense intelligence.

The Commission on Intelligence, popularly known as the Aspin or Brown Commission, was created by Congress to thoroughly evaluate the U.S. intelligence community. One of the closed hearings held by the Commission, on 3 August 1996, addressed open sources. Among the four individuals testifying were the National Security Advisor to the President, Dr. Anthony Lake and the founder of OPEN SOURCE SOLUTIONS, Inc., Mr. Robert Steele.

At the end of the session, a Thursday afternoon, General Lew Allen, USAF (Ret), challenged Mr. Steele to join in a benchmark exercise testing private sector capabilities against those of the entire Intelligence Community. Burundi was chosen as the target, and a deadline was set for 1000 the following Monday.

The Commission was surprised by the results. In short order, they received order of battle information

on tribes from Jane's Information Group; strategic commentary from Oxford Analytica; a list of available Russian maps down to the 1:250,000 level from Eastview Publications; a list of authoritative journalists from LEXIS-NEXIS; and a list of expert academics and others from the Institute of Scientific Information. Later, not part of the initial response, it was determined that SPOT imagery was available for all of Burundi and could be used to produce 1:50,000 combat charts and mission simulation programs.

As a direct result of this benchmark exercise, the Commission included in its final report an extraordinarily detailed and strong statement on the importance of open sources. The Commission noted that OSINT has limitations, but went on to state that the Intelligence Community has been "inexplicably slow" to provide analysts with access to open sources; that the Commission views such access as "critical" to the all-source analysis process; and that the Commission believes that open source access should be a top priority for the Director of Central Intelligence and a top priority for funding.

5016. Conclusion

Commercial imagery is a useful example of how open sources can support and enhance national intelligence capabilities:

-- 10 meter commercial imagery provides cheap and fast wide-area coverage, and has the added advantage that most of the world has already been overflowed and generally cloud-free imagery are already stored in the ground stations;

-- 1 meter commercial imagery--if U.S. policy and a lack of funding does not derail private sector efforts to create this new capability--can provide urban detail and a closer focus on key targets while avoiding an order of magnitude increase in the cost of maps which would accompany any attempt to use 1 meter for the whole world (not to mention the delay in collection); and finally

-- Classified imagery from the National Reconnaissance Office can provide the eight precision points per wide-area image that are necessary to create a 1:50,000 map to our standards of accuracy for combined arms operation.

The Defense Mapping Agency, or the new National Imagery and Mapping Agency, are ideally placed to manage a truly national program in which private sector open sources and classified Intelligence Community capabilities are fully integrated. This is the ultimate value of open source intelligence--as an integral part of the all-source solution.

What should we conclude from all this? First, it is clear that experts and data reside in the private sector, outside the intelligence community, which are vital to understanding and which should be harnessed in support of the all-source intelligence process. Second, these resources represent a potential source of savings to the U.S. taxpayer, since they are maintained at no cost to the taxpayer, are constantly validated by their survival in the marketplace, and--if properly exploited--permit the expensive classified capabilities to be applied more effectively to "the hard stuff". Open sources provide orientation and context. They do not provide the complete answer in most cases, but rather make the other intelligence disciplines more effective.

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