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FIELD EXPEDIENT GAMING: EFFECTIVE WARGAMING WHEN THE SHOOTING STARTS

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The written part of this presentation consists of an appropriate section from a forthcoming book of mine (*The Wargames Handbook*, Wm Morrow and Company), to be published this Fall.

Wargames and the 1991 Iraq War

Wargaming featured prominently in US efforts during the 1990-91 war in the Persian Gulf. On the morning of August 2nd, with Iraq's conquest of Kuwait still not complete, the Pentagon looked around for some quick wargaming on what was going on and what it all meant. The only kind of wargame that could get results quickly was a manual game, a commercial manual game that could be bought in a game store. The game used was Gulf Strike. Mark Herman had designed this game on potential wars in the Persian Gulf during the mid 1980s. The game had already been updated once a few years later and was still in print. Mark had, for several years, been working for one defense consulting firm or another, so the Pentagon knew who he was and what he could do. The Pentagon approached Mark at 10 AM on August 2nd, he was under contract at 2 PM and the game began at 3 PM (using various Pentagon Middle East experts as players). Before the day, Iraq had conquered Kuwait, but the wargamers in Washington knew Iraq was doomed. The results of this manual game were the basis of most of the decision making during August. Ironically, when Mark went to update Gulf Strike for commercial release, he had to borrow the Order of Battle (and other) information from the Arabian Nightmares game Austin Bay and I were working on for late 1990 publication. Mark had used classified information for the August 2nd Gulf Strike game, so he had to get a new set of clearly unclassified information for a commercial version of the Gulf Strike update. Since Mark was another member of the old SPI gang, we had no problem giving him permission to use all he wanted from Arabian Nightmares. Many of the numerous SPI "school of wargame design" graduates were prominant as analysts on TV during the war. One wargamer quipped that, "every time I turned on the TV news, it looked like an SPI reunion." For many years, SPI was the primier place to learn how to design wargames, particulary games on contemporary subjects. After leaving SPI, many of these designers went to work for the military or intelligence agencies.

Naturally, most of the officers and many of the troops in Desert Storm had used the dozens of different wargames developed during the 1980s. Before Iraq invaded Kuwait, wargames were used to determine what kind of force would go to the Gulf if there were a war. There had been contingency planning for a Persian Gulf war since the early 1970s and the planning had gotten even more intensive after Iraq invaded Iran in 1980. This pre-August 1990 wargaming did not deal so much with the nature of the future combat as with all the behind the scenes issues that had to be settled first. Among those issues were calculations on the size of the logistical effort required to get the troops there and sustain them. The composition of the forces sent had to be worked out, as well as plans for the use of air power. Professional wargaming gets involved with a lot of dreary details that commercial wargames do not treat in detail. However, in war victory goes to the side that is best able to cope with the details.

The operations of the combat units on the battlefield were gamed out using games similar to those available commercially. As the Persian Gulf was a desert zone it was expected that the fighting would make extensive use of mechanized forces. This was the war the US Army had been preparing to fight in central Europe against Russian armies since the 1950s. It was always assumed that the same tactics and weapons would do in the Gulf. One thing the combat wargaming also had to do was calculate expected casualties. This was a touchy subject, always had been. It's also something of a unexamined area in the Pentagon. In 1988 I was invited down to the Department of Defense Medical School to give a series of lectures. One of them was for

the faculty, and some officers from the Pentagon, on calculating losses in combat. In the course of my talk, I turned to the Pentagon group (whose specialty was calculating losses in future wars), and asked how they did it. The reply was, "that's why we came over here." They weren't kidding. Nothing much had changed by 1990. When the CENTCOM wargaming group was asked to come up with some casualty figures for a briefing back in Washington, they basically referred to average losses per day of combat for battles going back to World War II. They didn't need a computer or wargame for that. But when they were asked how many Iraqis would have to be killed or wounded before an August, 1990 advance into Saudi Arabia would be stopped, they came up with "50%." I had an opportunity to ask some of the key people involved where that number came from and was told, "the TACWAR game." TACWAR is one of the many computerized wargames currently used by the US Army. So I turned to one of the folks (no names, to protect the innocent) responsible for building TACWAR and asked how the "50%" figure was calculated. After being led around the mulberry bush a few times I discovered that "someone had picked up some numbers somewhere" and it was these attrition and "unit ineffectiveness" formulae from "somewhere" that created the yardstick of "destroying 50% of Iraqi forces to render them ineffective." This 50% figure was used repeatedly. Now you know where it came from. From somewhere. At least it worked.

The wargame operation assigned to CENTCOM (the Central Command headquarters controlling all coalition forces in the Gulf) was small. Normally, CENTCOM is located at MacDill air force base (outside Tampa, Florida). CENTCOM is the American military fire brigade for any emergency situations in the Persian Gulf area. There are similar headquarters for all major US area commands (one for Europe, one for the Pacific, etc.). The CENTCOM wargame operation had about two dozen people, half military and half civilian (usually consultants, and mostly programmers). They had lots of hardware, a VAX 8650 and a VAX 4000 minicomputers. Also two Sun network servers connected to 22 Sun workstations (industrial strength PCs). Numerous PCs were available in Saudi Arabia. They had three wargames available:

-TACWAR (division level). This did most of the work. Details of how it works further on in this section.

-TAM (an operational scale wargame designed by Mark Herman, derived from the SAS game Mark Herman and I did at SPI). TAM exists in both manual and computerized formats. Although CENTCOM didn't use TAM, it was used a lot in Washington and using TAM in September showed that by October, Saudi Arabia would be safe from anything Iraq could throw at it. TAM also showed that a lot more troops would be needed to force Iraq out of Kuwait, and even more to keep the US casualties down.

-JTLS (an updated MTM, the game I helped develop at the Army War College). Because this JTLS update of MTM prevented users from playing with the procedures within the game, it was not a useful tool for an ongoing war.

TACWAR was the game used the most because it was able to deal with the most detail (logistics, in particular). Game turns were one or more days, after which the user changed decisions and objectives and ran the next day or more than one day. Each day of simulated operations took one to three minutes of real time.

You could run a large number of days all at once, getting the time per day down to less than a minute. Speed of execution, of course, depended on the speed of the computer you ran it on. Normally, it runs on a VAX minicomputer, although in theory, any minicomputer or 32 bit PC running Unix (a computer operating system) could handle the game.

When the war began, part of the CENTCOM wargame operation was in one of the first cargo aircraft heading to Saudi Arabia. The part that went to the Gulf had nine troops, the VAX 4000 (a bit larger than a PC and more powerful than the older VAX 8650), one of the Sun network servers and seven of the Sun workstations. While TACWAR did a lot of the numbers crunching to calculate things like logistic needs and the movement of major units into the area, the workstations were used for spreadsheet modeling, report writing and preparing graphics for briefings. TACWAR, running on the VAX, took 15-20 minutes for each simulation of 30 days of operations. In most respects, TACWAR was a traditional military wargame. That is, you put in your assumptions about who could do what to whom and with what and TACWAR would perform a lot of calculations. TACWAR did not allow for players, as such. The user loaded in what he thought each side had and what they would do. The "artificial intelligence" routines that caused each side to make this or that decision during combat were not as sophisticated as those found in commercial wargames. But TACWAR was able to do a credable job nevertheless. Sort of like a commercial computer wargame where you let the

computer play each side and just wait for the results. In the case of TACWAR, the results are in the form of detailed reports and pay a lot more attention to logistics and support. TACWAR could deal with air, ground, logistics and chemical warfare operations as well as new units arriving during the period covered by the game. TACWAR did not have any fancy output (although that is in the works). You got page after page of numbers and cryptic terms. The Freelance, PC based, graphics package was used to pretty the TACWAR results up before passing them on to CENTCOM staff and commanders.

Manual and spreadsheet modeling were used to do a lot of the logistics work and sorting out how best to use the air power. In other words, a lot of the wargaming was done with tools available to, and familiar to, civilian wargamers. Civilian wargamers are generally shielded from most of the logistic and support details that are needed to make an armed force functional, but the military must pay close attention to these items. It was the computerized logistical exercises that made it possible to launch the ground attack around the Iraqi flank. Considering the millions of tons of supplies (and each item getting to the right place at the right time), over 100,000 vehicles and half a million troops involved, you can see how only a computerized wargame could handle such a load. TACWAR simulations indicated the best places for supply dumps, how much tonnage could be sent up which roads (or cross country) and if enough supply could be moved in time to support certain types of operations. A lot of credit for the apparent smoothness of Desert Storm has to go to the CENTCOM wargamers.

I don't know how many of the CENTCOM crew went through one of my lectures, but they certainly were using every tool in my toolbox. Order of battle data was kept in a commercial database program and dumped into JTLS and spreadsheets for analysis. Manual wargames were used, and modified as needed. Of the two computer wargames available, JTLS was only used to generate tactical deployment on the computer screens. These screens were then turned into slides and overlays for the many briefings that had to be given. Briefing were very important, the best wargaming in the world is worth little if you can't present the results quickly and clearly to the commanders who have to make decisions.

While a complete wargame operation was in Saudi Arabia, there was another one (the original equipment and troops not sent to the Gulf) back at CENTCOM headquarters in Florida. The two wargame operations had access to the same data and wargames. Data was transferred quickly through a satellite link between Florida and the Gulf.

As this was the first time US wargames went to war for all services, there were some problems. A major problem was keeping TACWAR up to date, as the game was still a pretty large piece of computer programming. While commercial wargames spend a lot of time making their products "bullet proof" (unlikely to fail when operating), military computer wargames assume there will always be programmers around to tinker with the program as needed. TACWAR had programmers available for on the spot enhancements and bug fixes. But the programmers did not have a security clearances high enough to allow them to work on TACWAR while it was loaded with the latest data about coalition troops in the Gulf (much less future plans). So when the programmers had to work on the system, a different (unclassified) set of data had to be loaded. The security problems went beyond programmer access. There was very tight security in Saudi Arabia concerning planning data. In addition to the usual keeping things locked up, troops were only allowed to know secret data that was required for their particular job. For the wargamers, this was a constant problem as they had to know everything in order to wargame out all the options the senior commanders were playing. As this was the American first war where wargaming was an integral and ongoing part of the command process, most of the people involved were not accustomed to sharing everything they had with a bunch of relatively low rank (mostly Majors) people mumbling something about games. Several times, it required the intervention of the CINC (commander in chief of CENTCOM, General Schwarzkopf) to get the data flowing to the wargamers. This tight security caused problems for other groups also, but none were as hassled by it as the wargamers. The wargamers had to know everything in order to wargame out what hadn't happened yet.

General Schwarzkopf went through the Army War College a few years before I began to give my lectures there. However, he had gotten religion as far as how much a commander should use wargames. The CENTCOM wargames crew was nearly worked to death, with overnighters (working all night) common. When the CINCs staff dropped a request in their laps, they had from six to thirty-six hours to get an answer. The actual gaming didn't take that long, gathering the information from all the units involved did. There was no centralized reporting for what every unit in the area was doing, could be doing or planned on doing.

Wargaming required much more information than anyone else in the commanders staffs and this was not fully appreciated until the commander began to rely on the wargamers to constantly check out his ever changing options. There were often several new scenarios to check out each week, in addition to updating the existing database of units and material (supplies) on hand. Granted, the wargame crew worked in an air conditioned bunker. But they were some of the hardest working troops over there. And during many Scud alerts, the air conditioning was turned off (to prevent poison gas from being drawn inside).

The Gulf wargamers were constantly called upon to give an update on expected casualties. Casualties were a hot political item back in Washington. The troops in the Gulf were also concerned about casualties, but they weren't worrying about elections. One of the first TACWAR wargames in August of 1990 set the then minuscule coalition forces against 23 Iraqi divisions trying to sweep down the Gulf coast towards the major Saudi ports and airports. This game showed 20,000-25,000 coalition casualties. But as the coalition forces poured into the Gulf, the casualty numbers coming out of TACWAR went down to about 2,000 by early February, 1991. The final estimate was higher than the actual losses, but then TACWAR was able to make the Iraqis fight back, Saddam couldn't.

As the first heavy wartime use of wargaming, a lot was learned about what had to be changed, improved and added. It's a long list.

1-Wargaming has to be a center of everything. If you want your wargames accurate, they have to reflect the reality of your current situation as much as possible. In a pinch, you can make estimates. But the more accurate the data in the wargame is the more accurate advice the wargame will give you.

2- Wargaming has to be part of staff operations. Historically, the commanders staff are the information gatherers and analysts who provide expert opinions on what will work best. The commander then decides what to do. A lot of staff officers are still a little leery of wargames. Some feel threatened, afraid that some (or all) of their jobs will be replaced by a wargame (with or without a computer.) Some of these staff officers are correct, but they are generally the glib deadwood you could do without anyway.

3-Keep everyone happy. There are dozens of different "unions" the wargame has to serve, and serve well, to be effective and convincing (or is it the other way around?). These "unions" comprise the different military specialties: infantry, armor, artillery, helicopters, air force fighter, bomber, tankers and transports, various navy specialties, supply units, maintenance, medical, engineers, special forces and so on. All have to see convincing results from the wargame for THEIR particular activities. Military wargames have always tried to do this, and often did it at the expense of the combat arms, as until Desert Shield/Storm, wargames didn't go to the front. Now they do, and to survive, wargames must please everyone.

4- Wargame faster. The primary reason CENTCOM bothered to take the wargames crew with them was because they knew they could get fast results. This was only possible with the new wargames developed during the 1980s. As wargames become even faster, they will be relied on even more. By the end of the decade, commanders will be running the show from their keyboards, monitoring the situation on a CRT.

5-Clear output. Cryptic output was a major shortcoming of TACWAR and a lot of time was spent translating that output into something the commander and staff could comprehend. Commercial computer wargame designers know all about this problem and I'm pretty certain that a lot of their solutions will be borrowed by the military for the next generation of professional wargames.

6-Build confidence. Failure travels farther and faster than success. It has taken most of the 1980s for the wargames community to generate enough successful work to win the confidence of some of the senior commanders. If the CENTCOM commander and staff were not confident in their wargame staffs ability, they would not have taken them to the Gulf. Wargame operations in the Gulf were generally successful, but many users came away aware of shortcomings. Military wargamers will have to build on their success and address their shortcomings in order to keep the confidence in wargaming high. There are still a lot of senior officers that have a dim view of wargamings worth on the battlefield.

7-Be neutral, objective and convincing. Wargamers have a lot of power if they have any credibility. The Gulf experiences showed how commanders and staffs would use wargame results to settle disagreements over how to proceed. But since the uniformed wargamer staff are drawn from a large range of other specialties, they all have (or are suspected of having) stronger loyalty to where they came from. Wargaming is not yet

a separate specialty. Officers from any one of hundreds of military job specialties are trained in the "secondary" specialty of wargaming (the colonel running the wargame unit formerly flew C-5A transports for a living). Eventually they will go back to their primary job, and there is always the suspicion that their wargaming advice will color their recommendations. So far, such favoritism has not occurred to any large extent. It was not an issue in the Gulf. But you always have to be careful.

8-More secure, more reliable and more flexible wargames. More speed and better output will not be enough for the next generation of wargames. TACWAR was the first of the new generation of wargames, or the last of the old generation, depending on how you look at it. It has gotten faster simply by running it on ever faster computers. Better output can be added to the existing program. But experience in the Gulf has demonstrated that this will not be enough. The security people were not happy with how safe highly confidential information was on the TACWAR computer. A combination of improvements in software and hardware will fix this. Reliability was another problem. Military wargames are not as stable as commercial products. Partially it's a tradition, of not people looking for problems and not enough quality control. That can be fixed, if old habits can be broken. Flexibility will come as a result of the Gulf experience. Now wargamers know what they will be called to do in a combat situation.

9-Think big. Wargamers have to think like their commander, wargamers have to look at the big picture. This has never been a problem with civilian wargamers, being in charge of their cardboard or electronic army has always been one of the primary appeals of wargames. But military wargamers are first, and often finally, staff officers. They have to stop thinking like clerks and more like commanders in order to get the most out of their games, or at least get what their commander needs.

The TACWAR crew was not the only wargaming involved in the Gulf war. Two months before Iraq invaded, CENTCOM conducted a large computer wargame postulating that Iran would invade Iraq and that the US would side with Iraq. What was notable about this wargame was that it used several different wargames and involved air, land and naval forces. In July of 1990, the US Air Force did a wargame of Iraq invading Saudi Arabia. Once the shooting began, the US Marine Corps conducted a series of six wargames (the first two manual, the others computer assisted) on possible future operations in the Gulf. A Strategic game was conducted in August, concentrating on getting forces to the Gulf. In October, there was a campaign game covering overall operations in Saudi Arabia and Kuwait. In November there was an operational level game concentrating on Marine forces. In December there was a breaching game, to work out how Iraqi fortifications could best be breached. Another campaign game was run in early February that predicted under 3,000 coalition casualties (on the assumption that most Iraqis would fight). In March there was a "War Termination" game, looking at what could happen after the cease fire. The results of all these games were added to what the TACWAR gang was coming up with and the results generally matched.

The US Air Force regularly ran simulations of their air operations, both before and during the air war. Back in the US, various agencies were also running manual and computerized wargames.

Most of the military wargamers had used commercial wargames and several stated publicly that they were influenced by them.

The Iraqis, it turned out, were also quite keen on wargames, all of them manual. Some were of the miniatures type, using detailed terrain models. Iraqi wargamers were willing and able, most Iraqi combat troops weren't.

As a footnote to all this, there was quite a lot of commercial wargaming activity on the Gulf war during the "waiting period" between the Iraqi invasion in August 1990 and the coalition counter offensive in January, 1991. In August of 1990, I was again editing Strategy & Tactics magazine. Some wargamers, aware of my past efforts in doing games on wars about to be fought, suggested that it was time to do it again. I didn't have the time to do it myself, but thought it was a neat idea and suggested that a friend of mine with wargaming experiece do it. Austin Bay was the fellow in question and he rose to the challenge. The design was complete in less than a month and appeared in print before the end of the year. The game, Arabian Nightmares, was right on target. It wasn't the only one. Mark Herman quickly came up with an "update kit" for his Gulf Strike game, and got ut into print by the end of the year and was also accurate in predicting the course of the war. Several other games also came out after the war, treating Desert Storm as another historical event to be wargamed.

Creating Wargames for the Troops

The military doesn't design wargames the same way commercial wargames are put together. There are a host of special situations and problems they must contend with. Since the late 1970s I have been called upon to give lectures, lasting from half an hour to several days, on how I feel it should be done. These lectures are quite popular and I get invited back to some venues year after year. More importantly, I constantly run into military wargamers who have been successfully using the guidelines presented in these lectures. What follows is the advice I have been giving to military wargames designers over the last fifteen years. This material has always been given in the form of a lecture, so it's about time to get it all into print. There are ideas here that even the designer (or player) of commercial wargame will find useful. There's no better way to understand the differences between military and commercial wargames than to compare what follows with the later chapter on designing commercial wargames. There are some interesting differences.

Some of the lectures last half an hour, some go on for several days. What follows is a recapitulation of all the items I try to cover. When I have more time, I go into more detail. Otherwise, I present a checklist format.

The Golden Rules

All situations can be easily modeled using a half dozen design rules and past experience with similar situations. The rules are:

1-Know what the user wants. It's difficult enough knowing what you want to do when you are doing a model for yourself. It's easy to start building a model with a vague idea of what you want. It's impossible to complete an adequate model unless you have developed a precise idea of what you want it to do. If the user is someone else, you have to help them figure out what they want it to do. This is not easy, and is often avoided because of the difficulty. Don't avoid it, be difficult if you have to. In the long run, this is the easy way out. To define the needs of the project, apply this checklist. It will get you started in defining the model users needs. If you can't define your project adequately, you'll waste a lot of time and effort. You probably won't complete your project either. The last thing you want to hear from the user is, "that's what I asked for, but it's not what I want."

A-Determine the Process to be modeled. Many different aspects of your model must be defined before you can proceed. Scale (Strategic, Operational, Tactical), Environment (Land, Air, Naval, Combined), Intensity (Low, Medium, High), Basic Aspects (Movement, Combat, Order of Battle), Special Aspects (C^3I, Logistics, Doctrine & Tactics, Fog of War--Is the situation highly dependent on one, or both, sides being in the dark about what is going on? If so, you will have to model this aspect of the situation.)

B-What do you want it to do? There are several different tasks you can direct your modeling towards. These can include training, research, analysis, etc. For example:

Test a hypothesis. This can be historical, contemporary or future). It can be about weapons, tactics, organization or whatever. Be rigorous in defining your hypothesis. A model will eat you alive if you are sloppy.

Define a process. You may want to break down an existing system into its essential parts. A model building exercise is excellent for this.

Provide training. There is no better way, other than actually going into the field with the system.

2-Start with an existing model. For example, to create a wargame for contemporary ground combat operations, you can wander off to your local game or software store and see what the commercial designers are up to. There are also companies that deal in out of print games that may be of use. If there are any gamers in your area, buy them a beer and pump them shamelessly for leads. There's also a lot of previous work in the non-commercial sector waiting to be plundered. No sense reinventing the wheel, especially since that approach is sure to lead to exceeding your budget and missing deadlines. Don't endanger your career. Plagiarize. There's no copyright on ideas and most of the ones you need have already been thought of and thought out by more experienced designers. I know, I often steal from myself (as well as others, that's why I'm an expert).

3-Be sure you know what you know. Pick a subject you have a keen interest in, or have gained a perceptive knowledge of. This will eliminate a lot of time consuming research. You wouldn't be doing this if you weren't an expert in something.

4-Compile information. Once you have agreed upon

what you want to do, you must gather information. Here is a sample checklist.

A-Area of Operations- Where, in time and geography, is the conflict to take place.

B-Scale- What is to be represented on the map, a few square miles or a continent.

C-Significant Terrain. For the Terrain Effects Chart, this is a winnowing process, in which you reduce all the terrain information you have gathered into a usable format.

D-Order of Battle. Units involved, their movement capability, combat capability and other characteristics.

E-Victory Conditions. This is a critical element, and often slighted or overlooked. What were the goals of the combatants?

F-Combat Results. Attrition rates in combat, with adjustments for other factors as needed and likely distribution of results for use with non-deterministic (unpredictability of combat) procedures.

G-Sequence of Play. Sequence that appears to work best in most situations is: 1-Planning and preparation operations, 2-Movement, 3-Combat, 4-Post operations checks (victory, morale, command control, etc).

5-Integration. The Big Moment, you create the prototype. This is where you assemble the first working version of the game. The Prototype is usually Quick and Dirty. Just get it working, quickly. Once that is done, Check the Switches. Whether the game is manual or computerized, you should have probability tables that can be easily changed to adjust the games outcomes in a controllable fashion. Finally, a note on "Pre-Dawn Madness & The Bleeding Edge of Technology." There is a bit of magic involved at this point. The model must be exercised, errors noted and the model modified and exercised again. Strange things will happen and you will often find yourself spending more hours working on this phase than you realize. This is the Pre-Dawn Madness most programmers are familiar with. Don't expect to understand everything that's going on in the prototype. If it works, leave it be and go on to the next item. Don't be any more inventive than you have to be. Beware the Bleeding Edge of Technology: stay with the simple and don't get cute.

6-Testing and User Acceptance. First there is Alpha Testing, where first you and then some typical users must be able to reproduce Historical Event, or defined hypothetical event. Then comes Blind (or Beta) Testing, where the game is handed to typical users without you hovering over them ("blind" to you). Lastly, there is testing ongoing after installation. No model is ever truly finished.

Differences Between Hobbyists and Professionals

Although hobby and professional gamers share many of the same techniques (and often the same games), there are some major differences between the two groups, differences that explain a lot of the differences in attitudes and accomplishments of the two groups. In short, these differences are;

-Professional gamers are, well, professional. They get paid for it. To many professional gamers, it's just a job. For hobby gamers, it's an avocation and an unpaid one at that. While there are many enthusiastic professional wargamers, all hobby wargamers are very much into what they are doing.

- Professional gamers cannot freely talk about what they are doing. Most of the classified wargaming work is severely restricted in terms of who can talk about it and where. Hobby gamers speak freely about their games and this torrent of comment and criticism makes the hobby oriented games much better for it.

- Professional gamers do not worship validation (being sure their games represent reality as much as possible). Most hobby games are historical games which, in order to work, must be capable of recreating the historical event they are based on. This ability to recreate the historical event is also called validation. Hobby gamers take it as a given that if a game cannot be validated it's not worth bothering with. Nearly all professional games are on wars not yet fought, so validation in the classic sense becomes moot. However, there is a tendency for professional gamers (or at least their masters) to make up their "future history" as they go along.

- Professional gamers serve many masters, while hobby gamers serve only one (themselves). Because professional gamers are getting paid for it, they have to be responsive to whoever is paying them. Often this involves not just one boss but an array of officials. All of these bosses want something from the professional games and often these demands are contradictory.

- Professional and hobby wargamers have somewhat

different backgrounds. Until the 1980s most of the professional wargamers had a computer and/or Operations Research background. Hobby gamers have a strong interest in history and technical subjects (science, engineering, medicine, law, etc., including OR and computers).

- Professional and hobby gamers have different experience with games and simulations. Hobby gamers nearly all have experience with general boardgames (especially chess, plus classics like Monopoly, Risk, etc.) Naturally, the hobby gamers are familiar with commercial manual wargames and, increasingly, commercial computer wargames. Hobby gamers are rarely familiar with non-commercial ("professional") wargames and professional wargamers are usually familiar with little else (except some of the general boardgames).

- Programming experience is much more common among professional gamers, as most of their games are still run on computers.

- Military experience is quite common among hobby gamers. The commercial games are more accessible than the professional ones, there are no security issues to worry about and this allows military people to openly address issues that concern them. Civilians with military experience are also more prone to use commercial games. In a tradition that is now over thirty years old, military people and civilians use the commercial games to obtain a greater depth of knowledge on military affairs.

- Use of wargames. The major difference between hobby and professional wargamers is the way they use the games. Hobbyists are interested in experiencing history, professionals are more intent on doing heavy duty analysis (thus the predominance of computers) and, increasingly, training.

Professional Connections

Gamers tend to be exceptionally well represented in a handful professions. This says a lot about the nature of wargames, wargamers and how the wargames work.

Programmers, or people comfortable with this uniquely 20th century exercise in logic and computer technology are well represented in wargaming circles. Many wargames now run on computers, but the ones that still attract programmers are the manual games. In these paper wargames the programmer can still tinker with the logic and procedure of the wargame. Most computer wargames do not allow such access.

Since the introduction of personal computers in the late 1970s, an increasing number of wargamers have gotten into programming in one form or another. All of these are relevant to wargames. The most common form of programming a lot of people are exposed to is personal computer spreadsheet programs (123, Excel, Quattro, etc). All of these programs feature a "macro language" which is, in effect, a form of computer programming language. Since most personal computers come equipped with the easy to use BASIC programming language, millions of computer users learned to use it. These millions of recreational and occasional programmers are added over a million professional programmers to create a ready market for game "simulations" of all kinds.

Military experience has had an influence on how hobbyists and professional wargamers approach their work. Increasingly, people without combat (or even military) experience work on wargames of all types. While much of the research needed to create a game required more scholarly training than time in the trenches, there was a certain insight required that could only be obtained from being in the ranks.

Designers of commercial games have the historical record, and if they lacked personal insight on how the military operates because they'd never been there, they could just work a little harder until they figured it all out. Professional wargamers have a different problem. Their games are on future wars and, as such, they have not got a historical gamers hindsight to keep them straight. The military tries to overcome these potential problems by getting the troops involved. Decades of officers playing commercial wargames has provided a pool of wargames savy troops to put to work on the professional games.

Another problem unique to the professional gamer is whether the person involved is a buyer or seller of wargame material. Many professional wargames are still produced by civilian firms who in turn sell them to other civilian managers running military wargaming agencies. Often this is a case of the blind selling to the blind with neither end of the transaction having a firm grasp of the subject.

Types of Wargames

While commercial wargames fall into only two types; manual map based exercises and computer versions of same, there is a far wider variety in the professional

level. Models and simulations are another matter, many wargames containing a little of both. In wargame parlance a Combat Results Table (CRT) is an "attrition model" and the more elaborate CRTs are indeed models in a very real sense due to its replicability and static representation of a process. Wargames usually contain several (or many) models linked together in a system. This, of course, is the classic description of a simulation, along with a simulations ability to handle multiple scenarios in a more interactive manner. The primary difference between a wargame and a simulation is fuzzy, based on the concept that a wargame is not capable of multiple runs from which statistically significant results can be derived. For many manual games, this is generally true, in a practical sense. However, once a manual wargame is turned into a computerized version, you can let it play it self a sufficient number of times to obtain statictically significant results. The advantage of the manual wargame is that human players can obtain broader insights from it and become better able deal with the intangibles of a situation. That said, some of the wargames described below are simulations and all these wargames contain models.

The following list shows the major types of wargames and their primary characteristics (for comparative purposes).

Manual Model with Map

What is normally thought of as a "commercial manual wargame". (The original military wargames were of this type. But that was before computers and beltway bandit consultants.)

1) Forces- Order of battle, all units involved in simulation. Must be consistent with scale of model. Optimum for playability is no more than 20 units per side.

2) Movement- Each unit assigned a numerical value representing its ability to move across terrain.

3) Combat- Each unit assigned a numerical value for combat ability.

4) Map Display- Choose scale carefully. Optimal size of map is 20 by 24 inches, or the distance that players can reach units without assuming awkward position. Hex grid is used to regulate movement and combat. Each hex cell contains a discrete type of terrain which shows up on Terrain Effects Chart with its effect on movement and combat.

5) Rules of Use- Explicitly written out procedures to operate model. This also gives insight into the underlying process that drove the situation being modeled.

6) Easiest model to create- Best preparation is simply extensive playing of existing games.

7) Inexpensive- Paper is most common raw material.

8) Paper computer- System organizes processing of information in much the same way as a computer, only much more slowly.

9) Easy to maintain- Procedures are largely self documenting because they are made obvious to the player. Otherwise, the model would be unplayable.

10) Labor intensive to use- An average size game will take 2-4 hours to play to a decision. Larger ones take much longer.

11) Not highly iterative- Time required for each game takes too long. Replaying individual turns has value, and proceeds much more quickly. Numerous iterations are required of a game in order for its results to have statistical significance.

12) Precursor of Computerized version. Programmer needs a manual model to work from.

13) Time Required- 500-2000 hours- Varies considerably with skill of creators. My personal record for a published model is 12 hours from cold start to tested prototype ("Battle for Germany" in one session from 6 PM to dawn, 1975). Another hundred hours required for testing and finishing rules. Lack of sufficient skill will make successful design impossible no matter how much time is used.

AUTHOR BIOGRAPHY

Active in the field of wargaming and modeling for over twenty five years. Author of over a hundred historical simulations, both manual and computer driven. Also author of a dozen published or forthcoming books on related subjects as well as numerous articles.