SECTION III:

Image and System

Graphics and Physical Systems Design

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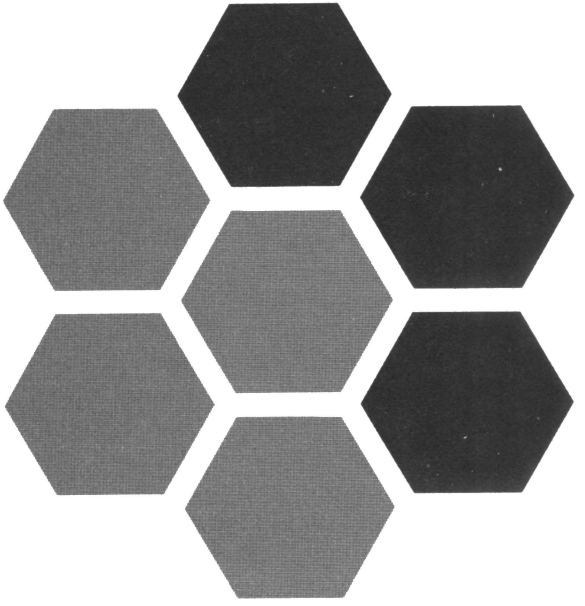


INTRODUCTION

One of the least discussed and least understood aspects of conflict simulation design is, ironically, that which is most obvious: the graphics and physical systems that make a game a reality in the hands and eyes of the gamer. In fact, the better the graphic design, the more likely it will *not* be noticed. Since, in game design, the overriding mission of the graphic designer is to *communicate* the substance of the game to the user, heavy-handed or flashy images that call attention to themselves (rather than their message) are actually detrimental. The type in which this book is set is a simple example of this: each letter is well designed and crafted—and yet, when strung into organized arrangements (i.e., words) the individual letters become invisible. If the typeface was eccentric or exotic in design it would be hard to read and would detract from the message rather than convey it.

I intend to deal with the *terra incognita* of graphics with regard to the following areas:

1. The role of graphic design in simulation games.
2. How the professional works and how a game is produced.
3. How the amateur game designer can produce a more professional looking product without the resources available to the professional.

Aside from the practical matters of production and technique, much of what I'll be presenting is naturally my own personal "doctrine" developed over the past twelve years (seven of which I've spent working on conflict simulation design). Since there is no "one-true-way" in matters of art, my graphic philosophy would doubtless be challenged by other artists and/or gamers. I would like to point out (at the risk of sounding elitist) that that which is superficially eye-catching may in the final analysis, not be the best solution for a game/graphics problem—and many non-artists have difficulty in separating that which looks good from that which works well. The two are not mutually exclusive—but neither are they necessarily mutually *inclusive*. Readers familiar with my work are aware that I am an advocate of form-following-function and will accept my statement that the graphic "philosophy" expounded here is not a mere rationalization of an artist's quirk of style, but rather a sincere explanation of a point of view developed and put into practice over a number of years.

THE ROLE OF GRAPHICS IN THE DESIGN OF SIMULATION GAMES

More than almost any other type of game, simulations are enormous information processing and learning problems. Even the simplest game requires the player to manipulate dozens of discrete pieces (units) in hundreds of possible cell locations (typically hexagonal); sort out thousands of relevant and irrelevant relationships; and arrive at a coherent plan of action (a move) several times in the course of the play of that game. It is a testament to the power of the human mind that anyone can begin to play such complex systems let alone do it well. The average gamer may have several dozen game titles in his library, each of which differs from the other—yet miraculously he can sit down on any given night and (with perhaps a glance or two at the rules) play a creditable game.

Given this large burden on the player, the challenge to the graphic designer is clear: make the information the player uses clear, organized, accessable, and pleasing to look at for long periods of time. To use a military metaphor, the player is an unspecialized demolitions man defusing a complex bomb and receiving instructions on how to do so via a radio. The game is the bomb, the game designer is on the other end of the radio and the artwork *is* the radio. If the radio is faulty, the unclear signal may break the concentration of the demolitions man (with unpleasant results). Now the qualities of a good radio are fairly obvious: good signal-to-noise ratio; adequate range; reliability; and good de-

sign of human factors (ease of handling, etc.). Metaphorically, these qualities translate fairly well into the qualities of good graphic design in games—what is not so clear, however, is exactly what constitutes a good signal-to-noise ratio in graphics or just what value to place on "reliability" (which translates as consistency of format). And although the gamer is not vaporized when faulty graphics causes him to "detonate" the game he's playing, the fact that it has indeed turned out to be a "bomb" is certainly unpleasant. Virtually every gamer has had the experience of struggling through what might be an otherwise good game, hampered by the fact that the organization and design of the components prevents him from easily understanding what he is about—and thereby losing concentration and interest in the game.

Many of the factors which degrade the performance of the graphic system in a game are not obvious to the average gamer. Some of these considerations are technical in nature: e.g., the size and style of type used on the counters; the intensity, surface quality, and range of colors used on the maps as they affect vision; the weights of the lines used to separate sections of charts or forms, etc. Others are organizational: the tables and charts should be well-integrated and logically formatted; the terrain symbology should be a development of a consistent approach; the rules should be presented in a systematic, accessable format, etc. Although they may not be consciously perceived, these factors all add up and impact upon the user as he plays the game. Wrong design choices can conspire in such a subtle manner that the gamer may not be able to pinpoint *why* the game is troublesome but he'll be aware that *something* is wrong and is preventing him from getting the most out of the game.

It is sometimes difficult to separate poor (or good) *graphic* design factors from poor (or good) *game* design factors. There is a great deal of feedback between the two. Of course, no matter how good the graphics and physical system, they cannot turn a weak game design into a strong one (although they can sometimes cosmetically hide an inadequate game design, at least for a while). But the reverse is possible: bad graphics and poor physical systems *can* ruin a good game.

Before going further, I should perhaps explain what I mean by the term "physical system". The term is really my personal jargon for the graphic engineering of game elements. The more graphic engineering the artist can build into the game equipment and rules, the easier and more enjoyable becomes the play of the game. Examples of this are: the Production Spiral used in SPI's *War in Europe* game system; Turn-Record Tracks with built in information on special events; Phase Records that are themselves diagrams of a complex sequence of play (such as in SPI's *Fast Carriers*); game maps with the set-up printed directly on them; integrated combat results tables (with terrain effects built in). A good physical system is characterized by its organization of game information to such an extent that the presentation actually accomplishes some of the "work" of using the raw information. It is possible (and often is the case) that a game is well-designed graphically, but no serious attempt at physical system design is evident.

Decoration Versus Design

One of the major questions a graphic designer must answer when approaching a new game project is: how much decoration is necessary, desirable, and allowable within the context of the information problem the game presents? The term "decoration" is used to indicate those graphic elements which have no practical bearing on the utility of the components. Well, if decorative elements are non-essential, what's the point of putting them in at all? In most games, some decoration is psychologically necessary in order to create the proper mood for the player who is going to spend several hours engaged in a game. Properly used, decoration helps the player to relate his activity in the game to the historical activity being simulated.

Unfortunately, many artists concentrate most of their efforts on these decorative elements and virtually ignore the practical requirements of the game. Decoration is information—*unnecessary* information—which if present in overabundance distracts the player from the truly important, game-play information he must have. Most people are, unfortunately, easily impressed by highly decorated games. Only when one plays such a game several times does the realization come that all that cute stuff is actually hampering play. Of course, the best possible combination is a well-designed physical system which has an overlay of just the right amount of mood-enhancing decoration.

Usually, the more complex the game-system, the *less* decorated it should be. When counters carry several different values and symbols; when the terrain is highly varied, when the mechanics of play are very involved, it is then that decorative effects should be kept to the bare minimum. It could almost be stated as a quasi-mathematical theorem: decoration varies inversely with complexity. As you might expect, it could also be said that the amount of graphic engineering required varies *directly* with the complexity of the game-system. Any such statements must always be qualified with the comment that there are no hard and fast rules in art. There will always be exceptional cases and mitigating circumstances. Even the borderline between practical and decorative graphic elements can sometimes become fuzzy. For example, tank silhouettes on tactical game counters may not be strictly necessary, but they do help the players to quickly distinguish AFV's from other types of units. Regardless of how simple the game might be, however, there are some elements of decoration that I am dogmatically opposed to. First on my list of such elements is the placement on maps of extensive terrain that has no effect on play whatsoever. There's nothing sillier than (for example) a large swath of desert glaring at the player when that desert is no different from ordinary clear terrain. If the designer wishes to impart the fact that there's a desert on the map, he could much more reasonably place a simple line of type indicating the name of the desert.

Second on the list are orders of battle that go strictly by historical designation without giving the player the option to ignore the designation and set up the game and the reinforcements purely by unit type and value. Particularly in large games, the set-up is one of the most tedious and time consuming exercises that a player must endure, every effort should be made to make this process as painless as possible.

Another such mistake occurs in counter designs which use large flag symbols (for example) to display nationality (when a simple color change is all that's necessary) and the important numerical data is squeezed into the small remaining space. In this case, as in many others, it's really a matter of proper emphasis being ignored or subordinated to some eccentric concept of "historical flavor". There's nothing *wrong* with such flavoring—it's simply a matter of knowing how much salt to put in the soup.

THE GRAPHIC DESIGN AND PRODUCTION OF SIMULATION GAMES

What follows is, in game jargon, the sequence of play of designing and printing simulation games.

I. THE PRELIMINARY GRAPHICS PHASE

A. Game Designer does sketch map using standards and procedures established by Graphic Designer.

B. Game Designer writes rules outline and develops order of battle.

C. Game enters developing and testing. Game Developer consults with Graphic Designer concerning particular problems in game that can be solved via graphics.

II. GRAPHIC DESIGN AND FORMATTING PHASE

Finished sketch map, counter manifest, and rules are turned into Art Department Copy Editor.

1. Rules are searched for bugs and inconsistencies.
2. Graphic designer designs terrain symbology to be used on map.
3. Graphic Designer designs counters, choosing type-styles symbology, and layout of various types of units.

III. GRAPHICS EXECUTION PHASE

A. Typesetting Machine Operator sets counter values and map labels.

B. Copy Editor and Graphic Designer format tables and charts; TMO sets material.

C. Boardman pastes-up counters.

D. Boardman does artwork for map/color separation.

E. Boardman lays-out and pastes up rules.

IV. FIRST CHECK PHASE

A. Game Developer proofs counter sheet and map.

B. Copy Editor and Game Developer proof rules.

C. Corrections performed by TMO and Boardman.

V. INSPECTION AND MARK-UP PHASE

A. Graphic Designer inspects finished, corrected art and mechanicals.

B. Graphic Designer marks-up work, giving printing and color specifications.

VI. FIRST EXTERIOR PRODUCTION PHASE

A. Artwork sent to camera-house (to be photographed and rendered as large film negatives).

B. Negatives sent to printer to be stripped up as a series of film negatives in preparation for plate-making.

C. Printer makes paper checking copy of film negatives and sends these to Graphic Designer.

VII. SECOND CHECK PHASE

A. Graphic Designer, Copy Editor, and Game Developer proof checking copies.

B. TMO and Boardman perform necessary corrections and correction film patch is sent to printer.

VIII. SECOND EXTERIOR PRODUCTION PHASE

A. Printer corrects negatives, and makes plates.

B. Components are printed and sample press sheets sent to Graphic Designer.

C. Graphic Designer and Printer give Binder and Die-Cutter, instructions on final finishing.

D. Countersheets are mounted and cut by Die-cutter. Rules, maps, and charts are folded, bound and cut by Binder.

E. Finished parts are partially or wholly collated by Binder and returned to Publisher. Game ready for sale.

Of course, the foregoing sequence is that which is followed at SPI—other publishers will have their own variations of the same basic

steps. SPI is vertically organized, i.e., all major production steps except the actual printing and binding are done by SPI staff. Other publishers may have one or more of the phases in the sequence performed by outside services—for example, typesetting or box art. In fact, some publishers have the entire graphic/printing sequence done for them by other organizations. While this approach has some advantages in staff salary savings, it does limit the amount of control that the publisher has over the finished product. When a game is produced totally "in-house" as at SPI, there is more opportunity for the creative people involved to interact and produce a better product. The elements of simulation games are extremely complex, and, therefore, the greater the communication between game designer, developer, graphic designer, and production staff, the greater the chance of producing an integrated, coherent whole. The four main parts of the typical game each present their own characteristic problems in design and execution. The graphic designer must be aware of these basic problems in the context of the individual game system for which the components are being designed. Although they must all work together, the parts of a game can be examined as distinct problems: These parts are: 1) the map; 2) the counters; 3) the rules; 4) the charts, tracks and tables that operate in the game.

The Map

Usually, the game map represents a specific section of the world's geography in terms of those of its features that have a bearing upon the maneuver and combat of military units. In other cases, the map is a synthesis of typical terrain designed to provide varied situations for a group of scenarios (the latter type of map is most often found in tactical level games).

The first step in map design is up to the game designer. He determines the scale and the features that will be shown on the map. The game designer or developer then prepares a sketch prototype of the game map. If the game uses a hexagonal grid, he does this by placing the source map on a light box and then placing the blank hex-grid paper over it. He then sketches in the terrain, employing a set of standards previously developed by the graphic designer. If there are unusual or particularly significant features on the map, a consultation with the graphic designer will be necessary. This sketch map (and copies of it) will be used throughout the testing and development stage of the game.

A final sketch of the map is prepared for submission to the Art Department and the graphic designer and the game developer discuss the requirements of the game as they have grown and changed in the course of development. The graphic designer will "interrogate" the game developer and designer as to what features of the game can be built into the map in order to facilitate play. This process is referred to as "interrogation" only half in jest: many times a developer or designer is so close to the design that he cannot imagine the need for various graphic aids to be incorporated into the game-map system. The graphic designer (who should of course be basically familiar with the game) can often draw out of the developer/designer important pieces of information that can be successfully integrated into the map design. What follows is a partial list of such questions:

1. Can the basic set-up be printed on the map using unit-pictures or codes?
2. Can the victory conditions be expressed on the map by coding the cities or sites that may be the objectives?
3. Would it be useful to code entry and exit hexes or reinforcement sites?
4. Are there any seasonal/weather changes that can be displayed on the map without interfering with the basic terrain?
5. Are there any rules other than victory conditions, that make some terrain feature or site important enough to warrant a graphic emphasis?
6. If the game involves the production of units,

are there any values or devices that can be built into the map to aid the player?

7. If the sketch map indicates more than one terrain feature in a hex, which takes precedence (and can the map be rationalized so that there is only one feature per hex)?
8. Are there any superfluous terrain features on the map or are there any redundant features that can be eliminated to clarify the actual, operative terrain analysis?
9. What are the effects of the various features? Is there a natural hierarchy that can be expressed graphically?
10. Are there any games in print which use a similar or identical terrain system? How well does that prior system serve the present need?

Other questions will suggest themselves in specific design situations—there is no magic formula for creating a map that is not only pleasant to look at but which, more importantly, serves and supports the game system.

There are, of course practical considerations that must be taken into account when producing a game map in a commercial environment. Limitations of the printing process, time restraints on creating the art, the price of the game and the cost of the components, the size of the packaging, etc., are some of the factors that influence the design of the map (or indeed, any piece of artwork). An effective graphic designer, however, can turn these limitations into advantages (or at worst, an operable discipline) and produce a map that works better and is better looking than one produced without restraints by a designer who fails to treat the map as a total unit to be integrated into the game system.

At SPI I've set up a number of standards for game maps in their various stages of production. This has been done for practical, management reasons but it also serves to reduce the learning problem for the player in the final, printed version of the map. In the sketch stage, the designer/developer makes use of standard colors and symbology developed by me in order to regularize the production of map prototypes. This enables to designer/developer to quickly produce his map without having to "re-invent the world" each time a new game is done. The standard symbols available are comprehensive enough to cover most of the variations of scale and period found in conventional conflict simulations. Because of the use of these standards, playtesters and production people alike can more readily read the map and copies of it can be re-drawn with less difficulty. Many standard approaches are also used in the final production versions of the maps. As mentioned, this relieves the player of some of the learning problem (if he's familiar with the games in the same general family) and also saves time for the printing people and for me. Because we do so many maps at SPI, these standard approaches have ample opportunity to experience refinement and evolution. The maps we do today are strikingly different from those that we did three or four years ago (although some basic resemblances can be detected if one looks hard enough).

When starting a map, the designer/developer may have a specific source-map in hand or may have to search for one. Usually maps are drawn from several sources. The Art Department often plays an advisory role in this initial stage. It's always best to use as a primary source, a map that is close in scale to that which will actually be used in the game. If the source map is more than three times smaller or larger than the game map, problems of accuracy and readability will arise in the sketch stage. The scale of the source map can easily be related to kilometers-per-hex by using the scale ratio found on almost all maps. For example, a map of Europe might be in the scale 1: 6,000,000. This means that every one unit-of-distance on the map equals six million of those units in reality. Since the size of our hexagons is known (in millimeters) we can just convert this known size into kilometers and multiply by the right-hand number in the ratio. The standard hex size in most SPI games (and non-SPI games) is 16 mil-

limeters, i.e., 0.000016 kilometers. Thus:

0.000016 x map scale = kilometers per hex.

The Europe map mentioned previously would then yield a game map with exactly 96 kilometers per hex if used same-size. A different scale is achieved by taking the source map and photostatically reducing or enlarging it to the desired scale. For example, if one wanted a map with only 32 kilometers per hex, the source map would have to be enlarged by a factor of *three*. To arrive at the necessary map reduction or enlargement, one need only divide the scale of the source map by the desired final scale. For example, if we wanted the Europe map to be 53 kilometers per hex, we'd divide 96 by 53 yielding 1.81, meaning that the source map would have to be photostatically enlarged to 1.81 times its original size. These simple formulas can be worked in reverse if one *knows* the reduction or enlargment necessary (to fit a map on a standard hex sheet) and wishes to discover the scale of the resulting map.

Once the map is scaled the designer or developer traces the black and white photostatic copy of the map using a light-box (simply a even source of light under a flat frosted glass that allows one to see through ordinarily opaque paper). This is one of the most tedious and time consuming initial steps. It has to be carefully done or else errors will be introduced at an early stage that may remain in the game through its publication. One of the most typical mistakes in this stage is to position the map incorrectly on the hex field. Because humans are creatures of convention, many people automatically orient the source map to the hex field in a rigid "north-is-straight up" fashion. Many times even the professional overlooks the possibility of rotating the map orientation to yield a better fit that results in more useable map per hex sheet and fewer dead-spots in the playing area. A good example of economical, unconventional map orientation is the *War in Europe* map system. If the same map were imposed in a strictly orthogonal fashion, it would have consumed twelve or more map sheets rather than the nine it actually takes. When dead spots occur unavoidably, the developer must inform the graphic designer of the opportunity to use the space on the map for some other map-related function. It's also pointless to execute terrain that is never going to be used—not to mention misleading to the player.

Once the map is aligned within the hex field and prototypes are sketched, the game begins to undergo playtesting. Items on the map will sometimes be modified or eliminated and new items may be added. It is important to maintain a control on the sketch maps so that it is always known which is the most recent and most "official" version. The final map sketch, submitted to the artist for translation into finished form, must be as accurately drawn and as complete as possible. As mentioned, the developer and artist must confer at the turnover point in order to treat any special problems and/or develop other game-features which can possibly be built into the map.

The typical game map is a simplied physical map overlaid with a political map. The graphic designer must make the proper choice of colors and symbology to create a map which will have high utility for the player and yet be pleasing to the eye. In my work at SPI, I've developed a number of approaches to the many terrain representation problems that confront me regularly. Some of the more basic and routine problems I consider to be "permanently" solved—and I apply that "permanent" solution to that type of terrain in almost every instance. For example, I almost always handle rough terrain as a continuous tone of a certain tint of brown totally filling the hexagon. In other instances, I have a number of standard approaches that I draw from based upon a judgement of appropriateness to the game scale and subject. This standardization allows me to concentrate on the many totally new terrain/map problems that I regularly face (as a result of the tremendous number of different game systems produced at SPI).

The graphic designer has available to him a range of choices as to how to convey a given type of terrain or map element. These divide into categories which I'll now list in order of their recognition value (i.e., the ease with which the average person senses the presence and meaning of the graphic element).

1. Color and tone
2. Shape and pattern
3. Symbol
4. Typography and outline
5. Position

What this means is that those elements most essential to the interpretation of the map should be represented by change of field color—since humans with normal eyesight most easily recognize differences in color. The problem with this is that there are a limited number of colors that will be instantly recognized without having to closely compare them to the other colors in the group used. For instance, if one chose to use four different types of blue (all meaning different things) it would be difficult for the average person to discriminate precisely amongst them unless they were all placed closely together for comparison. Colors also have the characteristic of *apparently* changing when the neighboring colors change. Place a green next to a red and it looks greener. Put an orange-yellow next to a red and it will look yellower. Tonal values also apparently change relative to the adjacent tones —light tones look lighter next to dark tones and vice-versa. This means that as a practical matter, the graphic designer can effectively employ only about three changes of value within a color and must limit himself to the use of no more than four or five colors (all of which should be spectrally well separated). Overlaid on these limitations are the limitations of the printing process. SPI maps usually use only *three* standard ink colors (although the visual impression is that of many more colors).

Additionally, the more colorful a map is the harder it is to read in an overall sense: the patchwork quilt of a multi-colored map can be confusing to the eye and tiresome to look at for long periods of time. For the same reasons, use of raw primary colors should be avoided in map work except as accents. When using color to convey information, the designer must strike a balance between the ability of the gamer to separate with his eye the difference in color and the harmony of the color scheme. In order to eliminate some of these difficulties, I've chosen to print almost all SPI maps on a paper-color called Sandstone—this color automatically harmonizes the ink colors printed on it and also reduces the glare problem. Incidentally, it's a basic principle of mine that no map should ever have a white field. The most common mistake in the use of color on wargame maps is too make the colors too harsh and bright and to surround them with large expanses of white paper. Not only is the effect produced ugly and hard to look at but it also is suggestive of a childlike level of presentation that undermines the legitimacy and seriousness of the game map.

As logic would indicate, the best type of terrain to represent as a field of distinct color or tone is that type of terrain which is itself areal in nature and can be associated mentally with one of the colors available to the artist. Obvious examples are fields of blue for bodies of water; brown for rough or mountainous terrain; green for woods; yellow for desert, etc. In conventional geography, color tints are used to separate one nation or political subdivision from another. This option is usually not open to the game map designer, since to do so would mean that the colors of the terrain would be altered by the field color. There are exceptions to this of course, and one of my own game designs, *After the Holocaust* is such a case. The subdivisions were very important and the terrain limited and relatively insignificant, therefore color was used to separate the many subdivisions on the map.

After color, the eye best perceives differences in pattern or texture. There are a number of topographic patterns that lend themselves very well to game map applications. Some of these are: foliage patterns suitable for wooded

areas; swamp patterns; stipple patterns suitable for rough and mountainous terrain; cross-hatching useful for man-made areal effects. These patterns are produced using prepared adhesive sheets (manufactured by a number of graphic arts suppliers). Depending upon the number of ink colors available to the graphic designer the use of these patterns expands the effective number of combinations of color and tone by a factor of two or three. Care must be exercised however, since the application of too many different patterns can give a map such a "busy" texture, the user's eye will be disturbed and distracted.

Patterns and textures assume even greater importance when the designer is limited to the use of only one or two ink colors. In one-color work, the patterns and textures, in combination with photomechanical tints, actually pinch-hit for the unavailable colors. Theoretically, it's possible to do *any* map in one color (i.e., black or dark brown ink) using only patterns for areal effects.

Such a solution of terrain can be a useful exercise for the designer even if he has more color available to him, since if he can solve the problem in *one* color he can then gain valuable insights into how to enhance his solution with the use of additional colors. This is analogous to executing a detailed charcoal sketch of a subject before going to paint it in oils.

Shapes are allied to patterns and texture as carriers of information. The organic, puffy edge of a patch of forest clues the eye very quickly. The splashy form of slopes and ridges and the irregularity of land masses are other examples of how the shape of large terrain features help to identify them for the gamer. Symbols can be thought of as smaller, more organized shapes. In game map design, symbols are most often used to characterize a "point" feature—something that resides in a single hex or location. Such things as cities, resource centers, industrial sites, forts, railheads, airfields, and ports are examples of terrain feaures that can successfully be represented by the use of symbols. Symbols are usually pictographic, i.e., they actually look like stylized versions of the feature they represent—or they are simple drawings of objects associated with the feature being represented—for example, a resource center might be represented with a pick and shovel symbol. Non-pictographic symbols are used when the feature being represented has no obvious object with which it is well associated or when the number of other symbols on the map calls for the use of abstract symbols to avoid confusion. Stars, for example, might be used to denote capital cities or arrows to indicate invasion hexes.

When using symbols, the designer must remain conscious of the fact that too many symbols, or symbols that lack recognition value, may actually confuse the player rather than convey the information. Moreover, symbols suffer from their trait of being obscured by the counters occupying the hexes containing the site being symbolized. This, incidentally, is an important consideration regardless of terrain treatment—how much will the counters affect the visibility of the playing surface? One solution (which I often use) is to fill the hex with the feature so that even when its occupied, the terrain is still visible around the edges of the playing pieces. This gives the map a somewhat more abstract appearence—but I feel that the sacrifice of naturalism is worth the additional utility gained by this technique.

By changing the color and/or size of the symbols, more variations can be achieved if truly necessary. Symbols can be combined with each other to form ideographs that convey more complex messages than any one symbol could. For example, a map shows three types of installations (ports, fortifications, and airfields) each of which must be characterized as being "major" or "minor" and also be identifiable as to which player possesses them originally. One could use twelve different symbols, but a better solution is to use a symbol in a circle to indicate a "major" installation and a different color to show ownership. This way by using only one more symbol (in conjunction with three basic installation symbols) and one color change one

creates a simple system that is easy for the player to remember and easy for the eye to spot on the map.

When designing symbols to be used on maps, some basic considerations must be kept in mind:

1. The number of different symbols should be kept to a functional minimum. Don't make arbitrary distinctions between items that, in the game, are treated identically. For example, if all fuel resource sites are operatively the same, don't show petroleum sites as little oil wells and coal sites as little picks and shovels. Instead, use a common symbol that evokes the "fuel" concept rather than the irrelevant fuel type.
2. To be effective, symbols must be simple and well designed. A complex, cluttered symbol does not contribute to player information retrieval. Most symbols are best treated in silhouette form.
3. The symbol should be evocative of the basic concept of the thing for which it stands. The test of a good symbol is how well it is understood *without* recourse to a key or legend. Whenever the artist is doubtful of the recognition value of his symbology he should show them to an associate without telling him what they mean, and ask that person to quickly interpret the symbology.
4. The symbol should reproduce well in the map environment. Even if the symbol is effective in isolation, unless it works in the context of the map, it can be a bad symbol. Also, when several symbols are used, they must all work well together. They sould have a consistency of style and approach that makes them into a total system.

The most abstract and generalized set of symbols that the designer routinely employs is the alphabet. Typography is an extremely useful tool in map design when used with restraint and a good appreciation of the reading problems presented by game maps. Beyond the usual typography of maps (place names and hexagon numbers) the designer can use type to carry more information than the simple words themselves. Changing the size of the type, for instance, can be used to express relative importance of cities. Change of style can be used to indicate differing categories of terrain. Changing color can associate the type with a given player or with a particular type of terrain. The designer must be careful not to use too many different styles of type on the same job—doing so creates visual confusion making the map harder to read. A good rule of thumb is to use no more than two families of type, each with their roman, italic, bold, and bold italic variants. The choice of exactly which typefaces to use can be made from a broad spectrum of possibilities—there are hundreds of different styles commonly available.

The two basic typefaces that I use in my work at SPI are called *Times Roman* and *Univers*. These were chosen because, first of all, they are well-designed typefaces and also because they are very versatile and legible whether used in text sizes or as headlines. This book in fact, is set in Times Roman. Although it is classified as a modern typeface, Times Roman looks appropriate when used on any subject from classical to far future. Univers is the name for a very large family of typefaces with many different weights and widths available. I avoid the more extreme members of the family except for very special applications. *Strategy & Tactics,* SPI's flagship magazine is set in Univers (specifically Univers 45/46 and 55/56—there are so many Univers variants they are *numbered* instead of named). More will be said about typefaces in the rules and counter discussions.

Positioning of map elements can also be used to send information (or to merely reinforce information). This must be done very carefully however, since its easy for the gamer to misinterpret signals that rely totally on their relative position. For example, if pictures of the playing pieces are printed on the map to indicate the starting set-up, one can discriminate between one force and another simply by rotating one set

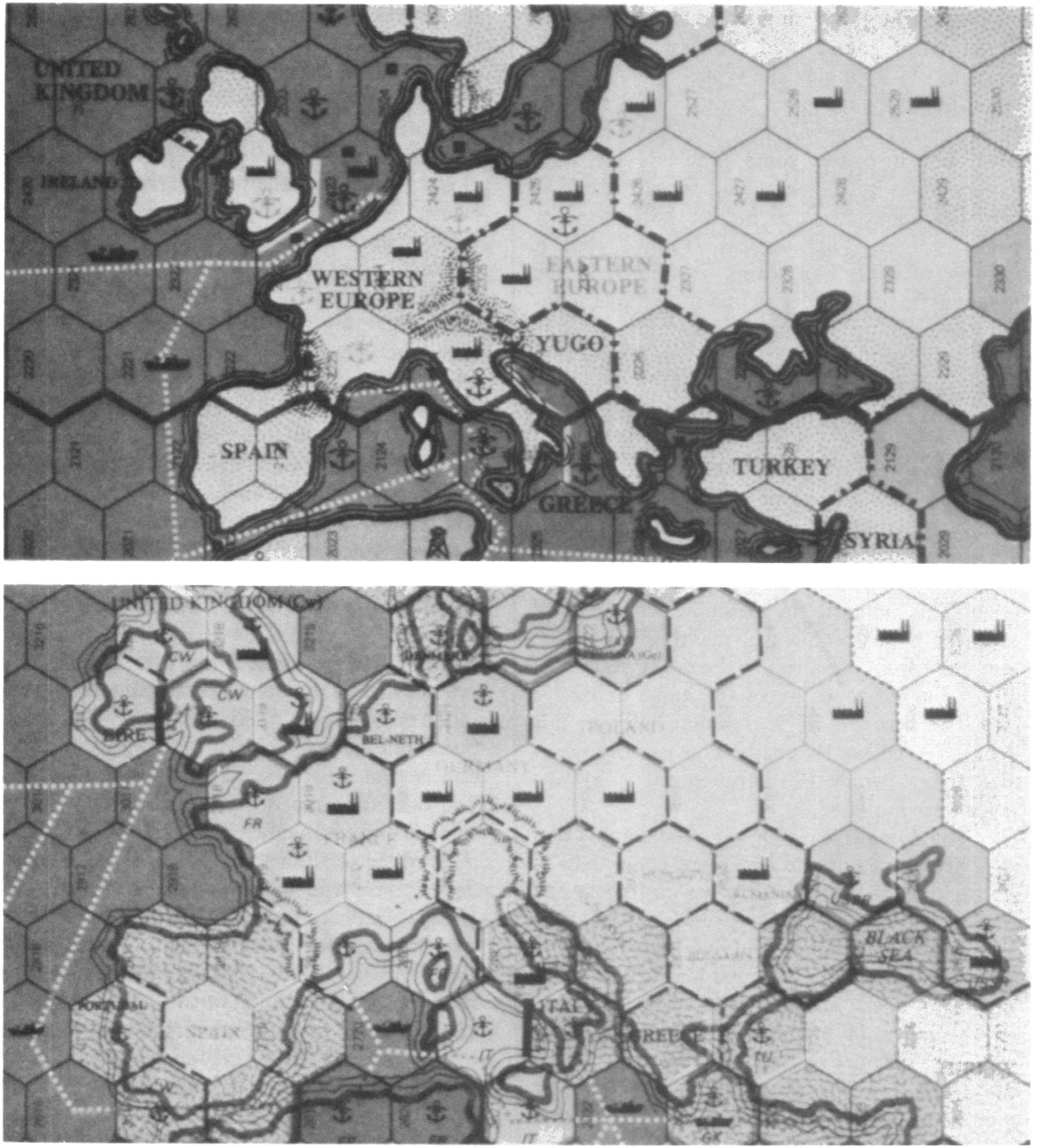
of images 90°. Or, for instance, if there are two sets of numbers associated with every city on the map (victory points and supply points, for example) one number group could be placed north of the cities and the other to the south. Such a system can cause a problem, however, if players are sitting on all sides of the map. As much as possible, type should be placed at right angles to both players so each has an equal chance of reading it. It can be a hidden advantage to one player if he sits on the side of the map where all the copy is right-reading from his viewpoint.

The graphic designer must avail himself of the foregoing techniques to create an efficient and handsome map. He must also treat the map as a total problem rather than trying to defeat-it-in-detail. He must, early on, make a basic decision as to how *naturalistic* his map treatment will be. That is to say, how much like an aerial photograph will his map look as contrasted to the opposite extreme of being very abstract and "game-like". A number of considerations bear upon this decision. For instance, the scale of the game should influence the degree of naturalism: the more tactical the map, the more it should seem like an aerial view of the actual terrain. There are exceptions to this rule—particularly if the game is very complicated or has unusual mechanics that can be simply expressed by the use of abstract graphic devices (such as hexside bar-coding). Then too, there are tactical games that have "all-purpose" terrain, i.e., terrain that changes with the scenario. In such cases, naturalistic terrain is actually a hindrance even though it's appropriate to the scale.

Strategic level maps, almost automatically, take on the appearance of traditional geographer's abstract. On extremely small scale maps (for example, SPI's *Global War)* the necessity to represent the terrain in terms of hexagons forces even greater abstraction in the artwork. [Terminology Note: the *smaller* the scale of the map the larger the area it covers]. In *Global War,* I designed a system which allows the terrain to be represented with considerable accuracy and without any doubt as to the nature of a given hex or hexside. The coding system used received mixed reviews, the negative part of which I feel comes more from the strange appearance of the map rather than the ease of use (which is high). The system uses three different types of hexside bar-codes to indicate whether or not a given hexside is impassable to land units, sea units or both types. In addition, all coastal hexes are coded with a hex-filling tint. The ghost of the actual shorelines is printed over all this for reference purposes (the literal coastline is ignored). This system has tremendous advantages over a conventional treatment of the map problem. It avoids any dispute as to the character of a given hex. It clearly shows which movement paths are open to a given type of unit. It even allows the geography to be presented accurately (without having to distort landmasses to conform to the hex pattern). The disadvantages are: difficulty and expense of execution in both test and final art stages; player resistance; and interference of coding with other necessary terrain features.

The use of hexside coding was something I've been experimenting with for as long as I've been designing. Back in 1970, I made one of my first uses of it in SPI's *Bastogne* game. Later, in *PanzerBlitz,* I sophisticated the system somewhat by using several different bar colors to code the hexsides. In many subsequent games, hexside codes became standard practice to represent blocked hexsides or any special characteristic of a hexside that could not easily be expressed in terms of the relationship of the areal terrain covering the hexside. Some day I'll give into a secret urge of mine, and do an accurate map of some battlefield rendered solely as hexside codes and full-hex symbology (not having any resemblence to naturalistic terrain at all). One could probably get the best playing map that way (but I'm afraid that the typical wargamer would rebel against such a coldly mathematical presentation).

SPI pioneered the unmounted game map—first out of economic necessity, then later out of conviction—it became the standard format for



Two maps of the same geographic area done in similar scales for two different games (top: *World War 3*; bottom: *Global War*). The *Global War* map is the more successful of the two (and indeed was a development of the *WW3* map). *Global War* represents a high-level refinement of the blocked hexside system used to express complex terrain relationships in the most unequivocal manner. By contrast, the WW3 system, even though it looks clearer, suffers from ambiguous land/sea relationships and distorted geography.

playing surfaces in simulation games. Traditional parlor games (and the first commercial wargames) all employ the typical glossy-paper-glued-to-cardboard game board. This is fine for parlor games (*Scrabble* and *Monopoly* and the like), but it causes some problems for wargames. First of all, wargame maps are big—typically about twice as big as the boards for parlor games. This bigness requires that a number of splits and seams be created in the mounted board in order to fold it up into a manageable package. This causes an annoying interruption in the playing surface plus it creates registration problems from one panel to the next—this registration (i.e., matching) problem can become critical in a hex-grid wargame. In most production lines it's impossible to mate the map sections from the same printed sheet. This means that the west portion of the map is cut out of one sheet; the central portion or portions, from another; and the east portion from yet another. This increases the matching problem (and adds the bonus problem of maintaining consistent color from one sheet to the next). Additionally, mounted maps make the game expensive (see The Business of Wargaming later in this book). The cost of the really large games so popular today, would be astronomical if all the maps were mounted.

The usual defense for mounted maps is that they are more durable and more convenient to set-up and use. In surveys of its customers and informal tests, SPI has discovered that *un*mounted maps actually survive more playings, in better shape, than mounted maps! This is less surprising if you consider that the stress placed on the joints of mounted maps is very great whenever they are packed and unpacked. Due to the trend towards compact packaging, most mounted wargame maps come in two (or more) completely separate sections that must be butted together to form the whole map. These sections easily separate by accident during play. Unless they are stored in perfect conditions, even the best mounted maps gradually warp creating more discontinuity in the playing surface. If this represents convenience of set up and use—make mine vanilla. Traditional mounted maps make use of glossy paper. I can't think of a worse surface to stare at for three to six hours of game playing than glaring, glossy, varnished inks printed on coated white paper. The use of glossy paper (and the press varnish that is laid over it) is simply an appeal to the more childish weaknesses of the consumer—"bright and shiny is good". Unfortunately, even the mostly rational intelligent consumer group that makes up the wargaming audience is susceptible to this appeal to some degree. Much of it is based on conditioning and tradition. Many people *expect* a game board to literally be a "board" and to be shiny and bright—so when one panders to this expectation the people are superficially pleased even though they are *not well served.*

This is not to say that *unmounted* maps are free of problems. The slight belly some unmounted maps exhibit causes a "trampoline" effect when the center of the sheet is pressed. This can be avoided by proper back-folding of the map and by using a few pieces of masking tape to stretch the map tight to the table—a few minutes of trouble that hardly is significant measured against hours of playing time. Better still, a thin sheet of clear acrylic plastic can be laid over the map to provide continuous stable surface (alternatively GE's *Lexan* clear plastic is even better than acrylic—it's virtually indestructable and will not support combustion). Using plastic re-introduces a glare problem—but this can be solved by using matte fixative spray on the plastic. The use of a high-surface (but uncoated) earth-colored quality cardstock allows SPI to produce good-looking, glare free, one-piece game maps that suffer none of the disadvantages of mounted maps and only have minor drawbacks of their own. As the new generation of wargamers grows up in an SPI environment (and as older gamers acclimate to unmounted maps) the unmounted, non-glossy mapsheet grows in acceptance and desirability.

To be fair, it should be pointed out that SPI "caved in" and made concession to the tradition

of mounted maps in its line of hardboxed games that it distributes mainly through toy and department stores. This was more a matter of getting the product past the wholesale buyers than appealing to the final customer. Chain-store buyers are even more tradition-bound than the customers they serve. The buyers care more about the box cover and the *weight* of the game as a selling point than anything else. The *heavier* the better—and mounted maps are heavier.

The "perfect" game map surface would combine the characteristics of both mounted and unmounted maps: it would be rigid; one continuous piece without splits; fold to compact size yet open perfectly flat; have a homogenous cross-section; and be truly durable. As yet there is no such perfect surface that can be made cheaply enough to be commercially viable. There is some promise though in the new plastic laminates that are coming into the stream as replacements for paper in certain applications. Until some designer (I hope it is I) comes up with a better solution, the gamer will have to cope with the less than perfect surface for this all-important component.

The designer should never lose sight of the fact that most gamers are deeply influenced by the game map: a good map goes a long way towards creating a positive impression of the game. Since the map is the most constantly used component, it should be the most effective in doing its job of providing the basic environment for the game.

The Counters

Typically, the wargame playing piece, or unit counter, is a half-inch square of cardboard that represents a military unit. This little chip of paper and ink can be the most concentrated source of information in a game. The numbers and symbols found on the counter (in conjunction with the probability tables) are the lifeblood of a manual simulation.

A wargame counter starts its career as a set of values arrived at by the game-designer (and/or developer) through research, empirical testing, and some inspired guesswork and approximation. The game developer makes a trial set of playing pieces by drawing them on blank counter sheets using a felt-tipped pen. During testing and development, the order of battle and the values of the counters will undergo modification (sometimes to the point of eliminating whole categories of values and/or units). Before the counter manifest is turned in to the graphic designer for production, the developer usually consults the graphic designer as to how the values should be formatted in the manuscript and what, if any, are the peculiar problems associated with that particular counter mix. The developer and the artist must discuss the quantities and types of counters necessary in order to insure that sufficient pieces are available to meet the needs of the scenarios and that the total limit is not exceeded.

The typical counter has a standard military symbol dominating its upper half and two large number values filling the space of its lower half. It may or may not have a set of smaller numbers associated with the symbol (i.e., those numbers that are its historical designation). This "standard" counter has been used so often that it's almost unnecessary to do any real graphic design work on such a counter mix. The great number of new games developed by SPI, however, have introduced the need for many new approaches to the problems of counter design.

To design a successful set of counters the graphic artist must be familiar with the game system and its requirements. As in map design, there are always opportunities to place some less-than-obvious piece of information on the counter in order to simplify play. In counter design, however, there is a premium on space and an imperative for legibility that severely narrows the options of the designer.

Most wargame counters are the size they are because of the limits of map size and packaging. Hexagons are the most common grid-cell—given the size of the hexagon there is a maximum practical counter size. For any size hexagon (measured from side to parallel side)

one can discover the theoretical maximum counter size by multiplying the diameter of the hex by 0.866. Applying this formula to the standard 16mm hex, one comes up with the maximum counter size of 13.86mm—which is about 1mm larger than the actual size of the standard counter. The counters *should* be a millimeter or two smaller than maximum to allow them to comfortably occupy adjacent hexes.

The actual working area available to the designer is actually less, of course, than the full counter size. There is an unuseable border area on each counter called the *safety*. Items which are printed in the safety area are in danger of being cut off by the knives of the steel die used in the counter manufacturing process. The die-cutting firm used by SPI requires a safety of 1.6mm. (slightly more than 1/16th of an inch). So on a 12.7 by 12.7 counter face the designer must confine his images to an area measuring 9.5mm square (about 3/8ths of an inch square). This area is called the *live area* of the counter face. If the counters are back-printed (i.e., double-sided), the limitations are even greater on the backside—the live area of the back is reduced by another millimeter all around.

It might be useful to explain here how counters are manufactured. SPI does the artwork for its counters at 150 percent of the final size (to make it easier on the artist). This art is photomechanically reduced to proper size, rendered as a film negative. The printer takes the film negative and makes a plate from it. The image is printed on good white paper about the weight of the pages of this book. This printed sheet is then sent to the die-cutter who mounts the sheet on cardboard and then places it into a die-cutting press to strike in the cuts that form the individual counters. As the reader can see, there are a number of steps involved all of which require accurate *registration* (i.e., image alignment) of the counter sheet. Each registration step introduces a slight error factor—this is the reason for the safety requirements previously referred to. Even with a safety, a number of sheets will be improperly die-cut. In the not too distant future, there may be such a thing as *laser die-cutting* which will increase the accuracy of the process by a whole order of magnitude. 'Til then we must cope with the present limits of technology.

Given the limits of the process, the graphic designer must strive to produce the most useful counter image. Counters should be designed with an information hierarchy in mind. This is simply a categorization of items to be displayed on the counter according to their relative importance:

1. Who owns the counter?
2. What type of counter is it?
3. What is the primary value(s) of the counter?
4. What historical or functional information not included in the above categories is necessary for the play of the game?
5. What historical information not included in the categories above is desirable to display on the counter even though the information is not functionally necessary?

Usually, *ownership* is signaled by the field color of the counter. When one player controls counters or several different nationalities or subgroups, the color field may be changed to reflect those groupings—thereby making one graphic device carry two pieces of information. The *type* of counter is most often indicated by use of a symbol—either the standard military symbol or a special symbol specifically designed for that counter set. *Primary values* (i.e., strength and movement ability) are most commonly shown as large numbers. Secondary *necessary historical information* is usually shown as either a smaller symbol or an alphanumeric set in type 75 to 50 percent of the size of the primary values. *Non-functional information* can print as either small type or very small symbols. Such information should never be allowed to dominate the counter —permitting it to do so is one of the most common mistakes of counter design.

Another basic question that the designer must answer is: what is the information load of

the counter and is it appropriate to the game system? Traditionally, the designer attempts to put as much useful information as possible on the counter face. It may be possible, however, to eliminate some information as redundant. It may also be possible—and desirable in specific games—to pull the information from the counter and place it on a data sheet separate from the playing pieces.

The counters in many air warfare games are examples of unit-information removed from the counter and otherwise displayed. SPI's *Fox-bat & Phantom,* for instance, uses the counter only to show ownership, position, and altitude—all of the remaining information is carried on a separate aircraft control sheet which itself uses a number of markers to display changes in the basic data—such as speed, climb, missiles remaining, etc. The feasibility of such an approach is not always obvious—the graphic designer must put himself in the player's place and make judgements concerning this basic question.

As a general rule, the more tactical the game, the more information will be displayed on the counter; the more strategic, the less information. If, however, a game becomes *very* tactical an information threshold is passed which demands that data be *removed* from the counter (as in the example of the air games). One might say that the extremes in scale result in very simple counters and the middlegrounds produce the most variation and problems.

After one decides how much information to place on a given style of counter, the artist must determine what means are to be used to display the various categories of information. What follows is a list of this means as they apply to the design of counters:

Color: Variation in the color field is almost always used to distinguish between nationalities. Sometimes within a nationality, special groups of units may warrant their own distinctive color field. For example, if airborne units are particularly important, they might be differently colored. Games that use leader counters often have these counters accented in colors different from the combat formations. In this way, color is being used to distinguish unit type. In rare instances, color is used to signal the value of a piece—in the game *Sorceror,* I used a color-hierarchy in the combat and movement systems. Whatever the use the color is put to, it should be remembered that a counter is a very small patch of color for the eye to distinguish—if the different colors used are too similar the eye will not be able to discriminate between them except when they are immediately adjacent to each other. The terrain colors should also be kept in mind—I regret to say that more than once I've been guilty of making counter colors so close to some terrain colors that the counters disappear when placed on the map—camouflage is fine in real war but a definite hindrance in simulated conflict. Dark colors also tend to look alike—particularly under the less than ideal lighting conditions of most game playing. Such colors also have the disadvantage of making the type on them hard to read unless the type is reversed out of the field (i.e., produced as a white image) which causes some difficulty in printing.

Symbols: For most military units, there exists a semi-abstract symbol developed by the US Army for use on maps and tables of organization. These symbols are perfectly adequate for most games (see the section in this book on symbology). Experienced wargamers know most of these symbols by heart, so when the designer uses them he reduces the learning problem for the player (although I should mention that new players are sometimes mystified and intimidated by this symbol system). In some games, however, these symbols are inappropriate and the designer must resort to either making up his own abstract symbols or using simple silhouettes of the basic element of the military force represented by the counters—for instance, a tank for an armored unit or a cannon for an artillery unit. Particularly in older period games, there is more reason to use silhouettes as opposed to standard military symbols—it just

seems more appropriate. Then too, if the counter is *very* simple, a silhouette helps to dress it up and prevent it from being too sterile. Each method of indication has its adherents in the hobby. My feeling is that neither is clearly superior to the other and that the designer must rely on his judgement to guide him into the right choice for a particular game. Whatever style the symbol, the more complex it is the bigger it must be in order to remain readable on the small counter surface. Silhouette-type symbols are most often found in tactical level games, and in air and naval games—one reason being that the abstract symbology for such games is not as well-developed as that for land units.

Type: This is perhaps the most important means for communicating information on the counter. The majority of wargames present the values of the units as digital information and just how those digits are arranged and displayed on the counter is critical. The *size* of the type is the first consideration: the designer must make sure that when the counters are put into play, the players can see the numbers on them! Virtually as important (but often not well selected) is the typeface. As mentioned in the discussion on maps, I use Univers and Times Roman typefaces almost exclusively. Particularly for modern games, the face Univers 65 is especially well-suited. Its numbers are compact and clean and easy to read in small sizes. When space is at a premium, Univers 67 (a condensed style) can be substituted. An equally well-designed face is Helevetica Medium (although this face sets a little wider than Univers—which is why I don't often use it). Most gamers would find it difficult to tell one sans-serif typeface from another—and my choice of styles may seem somewhat moot. On a subconscious level, however, the readability of the right typeface wins out and the gamer will find that the counters with the right typeface are easier to read than those using the wrong selection—even though he would be hard-pressed to explain exactly why. Type sizes are measured in *points* (of which there are 28 per cm or 72 to the inch). This book is set in 10 point type. This does *not* mean that the letters are 10/72nds of an inch high—it means that the "natural" distance from baseline to baseline of this type measures 10 points (in this book two additional points of space have been inserted between the lines to improve readability—this is called setting 10 on 12). The actual capital letter height of 10 point type is about two-thirds the nominal point size, or 6.6 points. The normal reading distance of a wargame counter is 30cm to 100cm (about a foot to a yard). If the type on the counter is smaller than 9 point, most people will have difficulty reading it at the far end of the working distance. As an experiment, place this book on a table and stand about one meter away. Can you easily read the following numbers?

45-2 889 0-21 4 67-6 90 5-2 0-9

The numbers above are 9 point Univers 65. You should be able to read them at one meter—but if they were much smaller you'd have a lot of trouble doing so.

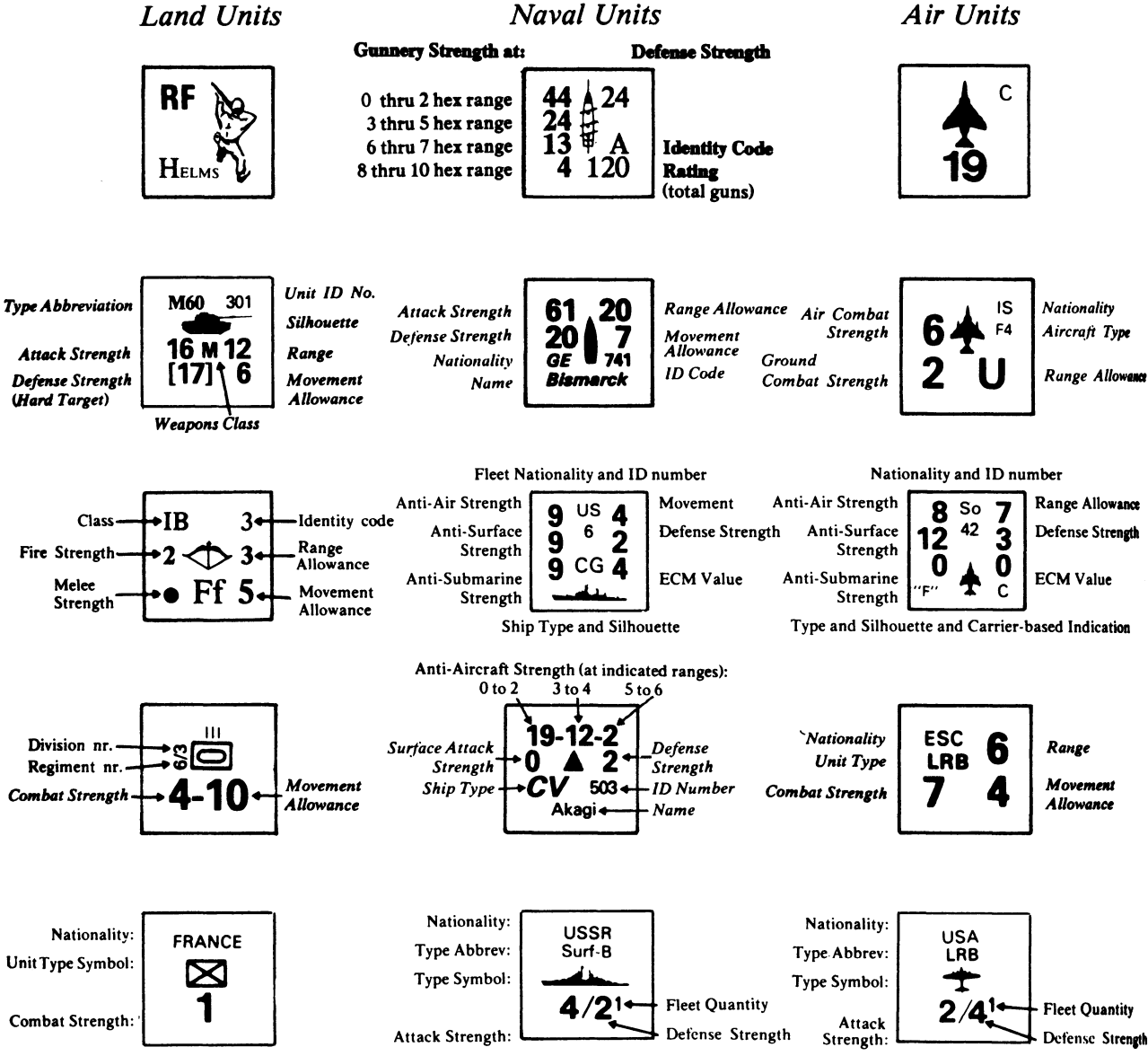
But it's not enough to use the right size type and typeface—the designer must also properly position and space the type so that the gamer has a fair chance of reading the counter. This can be quite a problem when the counters have several different values on them (as for example the counters in SPI's *Sixth Fleet).* When the counters require elaborate historical designations the graphic challenge is even heavier. Usually such material is set about half the size of the primary values—which means that unless the gamer is an eagle-eye, he must get fairly close to read this information. I have a somewhat radical viewpoint on historical designations on counters—I think they should be *eliminated* and replaced with an easy to read code—and I'll say more about it later in this section. In the foregoing discussion of type sizes, the reader should keep in mind that the actual art for SPI counters is done at 150 percent of the final size—so I actually set my counter type larger than the sizes mentioned to account for the reduction to final size.

A cross between type and symbol is the use of codes on counters. This can be as simple as a single bar of color to distinguish the "back" of the counter from the "front" or as elaborate as multiple dots and dashes to separate the counters into several discrete groups (for example, by stacking ability or morale values). The use of such coding relieves the designer from having to put another number on the counter and saves space by allowing him to superimpose one piece of information on another (since simple bar codes can be run right over the type without any ill effect).

As of this writing, not much use has been made of differences in *shape* as carriers of information. Most wargame counters are the same simple squares of cardboard for all types of units. The reason for this lies mainly in the expense of building new steel dies to have such counters manufactured. Then too, there could be some handling problems with differently shaped counters in play on the same map. But assuming these difficulties can be overcome, there are a number of interesting possibilities that have yet to be seriously explored by the major manufacturers. Take for example, a hypothetical strategic game with air, land, and sea units. The ground combat units could be traditional squares; the naval units rectangles; the air units circles, etc. Even the size of the counters could be varied somewhat to reflect relative importance (this is a very old concept which doesn't find much application in wargaming). There are a few games around that make some attempt at this—but no really thoroughgoing design work has been done. It might be useful here to shatter a myth that some gamers put their faith in—and that is the supposed "ideal" nature of hexagonal shaped counters on a hexagonal grid map. There are a number of flaws in the hexagonal counter concept: 1) A hexagon shape affords much less useable space for images on the counter. 2) Hexagonal counters are actually harder to handle and stack on the map. 3) Hexagonal counters so fill the hex they occupy that it's hard to tell *what* kind of terrain is in that hex; 4) A hexagonal die is very difficult to construct accurately—which is responsible for even greater irregularity than normal.

Regardless of the shape of the counter, there is the question of *surface*, i.e., matte finish as opposed to glossy finish. If you've read my earlier treatment on maps you know that I strongly prefer matte finish counters. The angle of incidence of the gamers line of sight with respect to counters in play varies from 90 to 20 degrees. If the counters have a glossy finish then at any given time during play, some of his counters will be unreadable due to glare. To my mind, the dubious benefit of slightly more brilliant color reproduction is not worth the true drawback of glare. I don't feel that I have to appeal to the wargamer's susceptibility to the "shiny syndrome" in order to produce a good looking set of counters. SPI ran a test to see how much difference glossy counters made to gamer acceptance: in issue number 58 of *Strategy & Tactics*, half the subscribers were sent glossy counter sheets and half were sent matte finish counter sheets. The feedback survey in the magazine asked them to rate the game—and a separate question asked them to rate the counters. On a zero to nine scale, both groups of readers rated the acceptability of the game *identically!* The ratings of the counters differed by only half a point (the glossy counters getting a marginally higher rating than the matte counters). In conversations I've had with gamers who actually *play* the games rather than just collect them, most have indicated that SPI's matte finish counters are better to play with (in fact as a result of the test mentioned above, I got a number of angry letters accusing me of "copping out" and caving in to the pressure for shiny counters). Those manufacturers who do produce glossy counters like to hoot about their durability compared to matte counters. This is simply not true—properly printed matte counters done on high quality stock with properly dried inks are actually *more* durable than glossy counters. This is because on an uncoated sheet, the ink actually sinks into the surface and bonds with the

EXAMPLES OF PLAYING PIECES (from various SPI games)



The above samples are arranged in three columns (by general type) and in ascending order of scale reading down the columns (i.e., from tactical level games through strategic). Land column: *Patrol, MechWar 77, Prestags, Panzergruppe Guderian, Global War.* Naval column: *Frigate, Dreadnought, Sixth Fleet, Fast Carriers, Global War.* Air Column: *Foxbat & Phantom, Oil War, Sixth Fleet, Invasion America, Global War.* Note that in general, the low level and high level counters are relatively simple, whereas the middle level tactical counters are more complex. Note that the naval units are something of an exception to this, since on all levels except the highest, they represent individual ships.

paper—on a coated sheet the ink floats on top of the paper and even though it may be varnished is more subject to removal by abrasion. Try this test: take an ordinary pencil eraser and stroke, with even pressure in one direction, on the surface of a glossy counter sheet. Count the number of strokes it takes to remove the color to a noticeable degree. Using the same eraser, do the same thing to a matte finish counter sheet produced by SPI. You'll notice that it takes *fewer* strokes of the eraser to degrade the glossy surface! To make sure the experiment is fair, try to do it on similar ink colors of similar density. If you don't want to ruin your counters, use part of the frame of the counter sheet to make the test. Incidentally, if you simply *must* have glossy counters, the best glossy counters you can get are SPI counters sprayed with acrylic plastic. Buy yourself a can of Krylon Crystal Clear or its equivalent, and before you punch out the counters spray them lightly several times (in a well-ventilated room), allowing them to dry between each coat. Doing this gives you a high gloss finish *plus* the ink is bonded to the uncoated paper under the spray coating, making for the most durable set of counters one could ask for.

The counters in almost all games have historical designations on them. Most of the time these designations are printed in a type size so small as to be readable only with close inspection. Because of the space problem on counters this is inevitably so—to a greater or lesser degree. In most games this is not much of a concern because the designations are irrelevant to the play of the game. More and more, however, game designers are producing games that employ historical command structures and higher unit organization in more realistic ways. This requires that the player actually *use* the designations during play. This is a burden both on the graphic artist and on the player. What I would prefer to do is to substitute a number code for the historical designator.

A well designed code system would have several advantages over using the historical designator: 1) It would be only four digits long (in most cases) and could therefore be bigger and more readable. 2) It would be more logical and easier to interpret than the sometimes less-than-straightforward military systems. 3) It could be related to an order of battle list that would give the corresponding actual historical designations. Using such a system would allow players to have the best of both worlds: they would be employing their counters in an historical manner but the historical relationship would be easy to grasp and large enough to see at normal playing distances. Take for example, a game like *Terrible Swift Sword* (a tactical level treatment of the Battle of Gettysburg). In the actual game there are two lines of type on every counter that give the historical designation of the unit. This gives you the regiment/brigade/division/corps of the unit. All this information is necessary for the play of the game, but because it is so lengthy in historical form, the designation is set in very small type—its effective size is about 6 points, i.e, only about two-thirds the size it should be. Using the system I propose, one could represent the relationship in a single four digit number that could be almost as large as the primary value numbers on the counters. The order of presentation would be reversed to read corps/division/brigade/regiment. For example "4312" would be the second regiment of the fourth corps, third division, first brigade. A unit representing the brigade commander would be numbered "431" and a unit representing the division commander would be numbered "43". In this way the hierarchal relationship is clearly and unequivocally expressed in quite a simple and readable manner. None of these numbers would be the *actual* historical division or brigade numbers but they would nevertheless be historically accurate when related to a key listing provided in the rules (so that players could see the historical names of the units if they desired). This system may never see the light of day because the typical designer is very territorial when it comes to giving up historical "flavor" for rationality—

and a vocal minority of players would scream if the 118th Bathwater Light Hussars didn't have their glorious name blazoned on their unit counter. So much for common sense.

The Rules

At SPI the art department has more to do with the rules than one might logically expect. This is because I am something of a fanatic about rules systems and proper explanation and organization. Many of the basic formats used in SPI rules are traceable to standards and procedures set up by my staff and me. SPI's rules are distinctly an SPI product—the typical set of non-SPI rules are rambling, conversationally written and weak on organization. Some people like such rules—I don't. I'm supported in my feelings by most gamers. A recent survey showed that SPI rules provide better and more accessible information on how the game is meant to be played. The same survey showed that although SPI's legalistic rules style may draw some cheapshots from those that are not up to such rigorous organization, the average gamer *wants* the rules to be precise, exhaustively detailed, and unambiguous. Let's face it: rules are not exactly light reading—the number of concepts and procedures to be explained in detail can hardly be dealt with in a few easy paragraphs of colloquial English. The closest analog to a set of rules would be a set of computer program statements Such comparisons inevitably draw knee-jerk negative reactions from certain people who equate technology and organization with dehumanization and sterility. What such people fail to see is that such systems are *enabling* devices—and are not the thing itself—the thing is the actual play of the game. The rules are means to an end—and they must be highly organized and efficient means to serve the complexity of wargame play.

One of the minor criticisms I've heard about SPI rules is that there are few light touches of humor to be found in them. To my mind this is all to the good. Rules are *documents*—to be referred to time and again. Have you ever read a joke more than once and laughed? And to be quite frank, most of the people (at SPI and elsewhere) that write rules are not what you would call great sophisticated wits. The high-school level humor that sometimes finds its way into their rules writing is nothing to be savored. Rules writing is inescapably *technical* writing—not literature. It's object is unequivocal communication—not entertainment. The entertaining part is supposed to be the play of the game.

The game designer usually starts with a very rough outline of the rules to the game. The developer has the primary responsibility of turning this into a set of complete rules statements. This is an extremely difficult thing to do well. How difficult it is to do can only be appreciated by those that have tried it under professional conditions. With all the testing, proof-reading, and evaluation that SPI rules undergo in their life history, there are few extant rules booklets that don't still carry mistakes, inconsistencies, and omissions. SPI's policy of issuing errata after their rules are published has brought criticism from some quarters—particularly invidious are the thinly veiled gibes of competing companies that do not *admit* their mistakes and continue to make their customers suffer with error ridden rules until they get around to publishing a second edition of the game. One must be honest about the limitations of the rules generation process—to create *flawless* rules on the first go round is virtually impossible unless the game is so simple as to be irrelevant. Beyond simple typos and plain oversight, there will always be the possibility of alternate interpretation of given statements—because the player is *not* a computer: he's a thinking human who brings his own background and mind-set to the reading of the rules.

When the game is turned in to the Art Department, the copy editor and the graphic designer go over the rules for styling and formatting, plus they attempt to make sure that the rules are complete and comprehensible. Usually a publisher will develop a "house style" in which

all their rules are set. The graphic artist must see to it that this style is as flexible and as effective as possible.

The style that I've set-up for SPI is one that incorporates the following main features:

1. Rules are to be indexed according to Main Section and Sub-section.
2. The body of the rules shall consist of main sections introduced by an overall statement (called a General Rule) and divided into subsections (called Cases). These sections shall all be numbered using a decimal numbering system that expresses the hierarchy of the rules.
3. Whenever possible, the ordering of the rules shall follow the sequence of play.
4. Sections and subsections shall carry concise titles expressive of their content.
5. Rules shall be set no smaller than 8 point type and printed in booklet or folder format.
6. Separate sheets will be kept to a minimum.

The graphic designer should gain enough familiarity with the rules of the game so that he can adequately judge the need for "graphic intervention" to relieve the player of needless work and also to insure that any procedures in the rules are consistent with his graphic solutions and vice-versa. He should insure that sufficient graphic and written examples are included in the rules—many times a rules writer will be guilty of making too many assumptions about what the gamer "already knows".

Final copyediting of the rules, at SPI, is the responsibility of the Art Department. This usually involves a lot of consultation with the game developer/rules writer in order to ascertain exactly what he *meant* when he wrote what's on the manuscript. Once they are marked up, the rules go to the typesetting machine operator. The operator keyboards the copy using a fairly sophisticated phototypesetting device (at SPI) that transforms the typewritten manuscript into strips of justified type on photographic paper. These strips (called galleys) are read for errors and then turned over to the layout artist who will cement them onto page forms. This *paste-up* of the rules is then xeroxed and read again (by both the developer and the copy editor) in order to catch any errors that got by the first time. Corrections are re-set and pasted over the erroneous portions of the paste-up forms. Most gamers don't realize that what they see as a continuous page of orderly type is actually the result of dozens of pieces of paper precisely pasted into position by a human being. The paste-up forms are then *imposed* on an eight-page master form in the order that will produce a properly sequenced set of pages when folded and cut by the binder. A same-size film negative is made of this page form and given to the printer who makes a proof copy of the negative for final checking by the publisher. Corrections at this stage are fairly expensive and tedious to do—so only really vital changes are made. When corrected for the last time, the negative is "burned" onto a metal plate and printed on a sheet of paper which is ultimately collated, folded and cut to produce a finished rules booklet. Once the first edition of the rules has been sold it will generate a certain amount of errata arising out of the questions asked by the players. An errata sheet will be published in the same format as the rules. Whenever possible the second edition of the rules will be corrected to incorporate this errata.

My favorite fantasy (regarding rules) is to have a master file of hex-grid wargame rules that would cover every possible situation that could occur in a game. These master cases would be precisely and lucidly written and organized into a data retrieval/word processing system so that entire blocks of rules could be called up electronically by keying in a string of code numbers. The developer would then add whatever minimal necessary names and dates and the whole body of rules would be automatically typeset. Every case would have a master reference number and a computer program would make sure that every case number that needed cross-indexing what get it. I'm actually