GameDesign

#3

FIRST CLASS MAIL

Designer's Notes ①

First, a few words about format. As many of you know, the S&T
Supplement and Game Design both use the same physical format. The
Supplement, of course, was once a 24 page 8½x11 inch magazine.
The 24 page format, however, was expensive. Some 40% more expen-
sive than the present format. In addition it did not look as good,
mainly because we simply couldn't afford to have it assembled by
machine, as is the case with S&T. On top of that we had to send it
by third class mail. A notoriously inefficient way to get things
to people. So we came up with the new format. It is cheaper, so
we can spend more resources on such niceties as better paste up
and lay out. Not to mention first class mail. On the minus side the
new format contains 12% less material as the old format. But then
we're not losing money on the project, which was the case before
we changed formats. Printing prices went up over 100% since we
began the S&T Supplement. We had three choices; raising prices,
cease publication, or change format. We chose what we felt was the
best course of action. Had we not chosen this way out Game Design
would probably never began. So there!

Five hundred copies of this issue of Game Design are going out free
to subscribers of S&T. The object of this generosity, of course,
is to induce people to subscribe to Game Design. After reading Game
Design many people will say (or at least the 50% who regularly
indicate an interest in designing games), "Yup, that's for me!"
Yup, now here's why.

In this, our third issue of Game Design, we again continue our reg-
ular features. Such as, Designer's Notes, which lays on you the latest
word on what's being done in the design of simulation-games. Ac-
 tually, we cover, for the most part, only what is happening with
us. But then we make most of the news (no false modesty either) in
simulation-games. So we let you know about it. That's only part of
Designer's Notes, the greater part is discussion of the techniques
of designing games. This by someone who has designed (at this
writing) 25 published or due-to-be-published games. That may not
connote wisdom, but it does signify experience. In Designer's Notes
we try to teach the techniques of designing games. That will take
a while. But if you hang in there you might just make it.

Other features are, for example, Design Notes. Here the designer of
a specific game goes into detail on how a particular game was put
together. In Data Modules a particular area is studied in great de-
tain, as are engineers in this issue. Then there is the Avalon Hill
Review in which Omar DeWitt, Avalon Hill's official "answer man"
goes into detail on some of his rulings. A similar column appears
from time to time, TSG Review, covering Test Series and S&T games.
In addition we also publish anything else that seems to fit.

Now on to the regular business. There are two new interesting pro-
jects in the works just now. First, we are working with Sterling
Hart on a game of the Franco-Prussian war. Big deal. But this game
will have "hidden movement" for both sides. On the same board.

The game is on the corps level. With step down unit reduction.
There are eight units on the French side and fourteen on the
German. The Germans get 20 "dummy" counters and the French 10.
No zones of control. You don't know what a unit is unless you
attack it. And you don't know what you're attacking unless you
attacked it the turn before. Three CRT's for both attack and
defense (so far). If this system can be made to work it will
be quite a breakthrough. It will, for one thing, give rise
to a veritable flood of Civil War and Napoleonic games on the
strategic level. We hope to have it published by the end of
Summer, or October....

Another interesting project is underway by Jack Kramer. It's
called CLERVAUX and deals with a US infantry company's delay-
ing action against superior German forces on 16 December 1944
at the beginning of the Battle of the Bulge. The game system
will be similar to that in GRUNT only using a lot of street
fighting and such. Publication date is uncertain. CLERVAUX,
like the Franco-Prussian game, will probably be a TSG.

One may wonder, "Why all this innovation?". Is it innovation
for the sake of innovation? To a certain extent, yes. A good
game should be simple enough to be played and understood
easily. This means that you can't have too much "dirt" in it.
"Dirt" being defined as the neccessary mechanics (read rules)
to make the game go. Too much dirt and there isn't much ener-
gy or attention left for what the game is trying to say. How
does the game say what it's trying to say? By allowing the
players to "play" with it. But you don't get much playing done
if it takes all your energy and attention just to get the play-
thing going. Try to cover too much in one game and you cover
nothing. What this all boils down to is the fact that you should
build into the game only the most important elements of the sit-
uation you are studying. Thus the game on the Franco-Prussian war
should emphasize the fact that two armies blundered into each
other for most of the "campaign". A series of errors and chance
engagements, so to speak. This was one of the more important as-
pects of the campaign on a strategic level. The armies blundered
in a fashion familiar to armies before the use of air reconnais-
sance. Without this one element you can't really have a game
that realistically recreates the campaign. But this does not apply
to all pre air reconnaissance campaigns. The Leipzig game, for
example, shows that the "central position" was more important.
Particularly in view of Napoleon's superior use of what reconnais-
sance then available to him. This, however, was unique to cam-
paigns conducted by Napoleon. The American Civil War had no
Napoleon. Most campaigns were of the "blunder" type.

Can you see it now? Concentrate on the most important aspect(s)
of the situation. Do it well. To do it well you often have to
create new ways of doing it. Looking at things this way, game-
simulations have gone through three distict phases so far. When
this type of game was first developed in the mid-'50's the
emphasis was on re-creation of modern "semi-strategic" (divi sion-
al) level simulations. With few exceptions this "rut" continued
right up until 1914. The sole exceptions being the naval games
(MIDWAY and BISMARCK) which, of course, required a different
approach. JUTLAND and 1914 were hints of another solution, in
my mind an incorrect one. Bigger does not mean better. ANZIO
proved this. ANZIO was supposed to be the "compromise" game

between the unwieldiness of 1914 (although it's strong histor-
ical "realism" was considered, with some validity, to be a posi-
tive feature)and the popular "playable" simplicity of BATTLE OF
THE BULGE, STALINGRAD and D-DAY. It didn't work. ANZIO will no
longer be available once the current inventory is sold (this may
take a few years). JUTLAND will also be dropped, as will the other
naval games, through no fault of their onw, of course. Naval games
simply don't sell. GUADALCANAL will also go. This was a game that
went out of its way to ignore those elements of the campaign which
were most important (mainly naval and air). Earlier games, for all
their crudeness, were at least simple. Often they did not zero in
on the critical aspects of the situation they covered. But they
were simple enough for most players to handle. And their simpli-
city allowed what elements of the campaign that were shown to be
explored. An outstanding example of this is the initial force
inbalance and later weaker side build up in BATTLE OF THE BULGE
and STALINGRAD. D-DAY also has it to a certain extent, except
that the attacker was initially weaker. The first "wave" of games
(ending with JUTLAND) showed too many people that a much better
job could be done. The reasons why Avalon Hill did not solve the
problem and why they did do what they did are the subject of a
future article in S&T. Such matters don't really concern us here.
The 1914 "solution" was less a solution than it was a probe in the
direction of alternatives. Out of the 1914/ANZIO debacle came the
realization that each game must be a unique problem with unique
solutions. Thus came the "third" wave, mainly the Test Series
and S&T games (including PANZERBLITZ). Each game attempted to
treat its own problems with unique solutions. At present this
seems to be the "solution". At least until something better comes
down the pike. Which will probably happen.

Taking these games as the current "state of the art" they can be
easily understood by simply applying the "uniqeness" principle to
whatever game you are doing. This does not mean that every game
must be as simple as, say, GRUNT, KURSK or TAC 14. A large minor-
ity of game players (but still a minority, we KNOW that) desire
more complex "muscle" games (as we call them). A current example
is WAR IN THE EAST. But for all its complexity it still concen-
trates on those aspects of the campaign that were most important.
There is no "dirt" for the sake of "dirt". At the same time the
game is structured so that as the more complex versions are played
the game merely gains in realism without changing into a "differ-
ent" game.

All the foregoing was a roundabout way of driving home the
point that, for a game to do what its supposed to do, it must
use unique rules and other design features in order to get
its message across. This presupposes , of course, a fairly set
idea about what the "ideal" game should be. Stated briefly,
my idea of the "ideal" game is one that is fairly easy to play
(KURSK and 1940 are about right, I feel) and place major empha-
sis on the most important aspects of the campaign (at least as
far as the designer is concerned). These two games fit the bill,
I feel. Even though KURSK and 1940 use essentially the same play
mechanics. This, of course, is not as contradictory as it may
appear. Both games covered campaigns having both motorized and
non-motorized units, with air power. The scale was about the same,
each hex in 1940 equalled 13 kms, in KURSK 16 kms (identical to the
1914 scale). Each game used two day moves. There WERE differences,
however. The French army had a psychological problem the Russian
army had already gotten over. The German army was basically the
same. In 1940 the Germans have the edge, in KURSK the Russians do.
1940 emphasizes the German need to destroy the French army as an

effective force. In KURSK they must do the same, although because
only 40% of the eastern front forces are involved in KURSK(com-
pared to 90% in 1940) an absolute decision is not possible, or
at least difficult to obtain. More difficult than in 1940.

The question now arises, how does one isolate the "key" problems
in a situation so that they may be incorporated into a game. This
is where the skills normally listed under the job classification
 "Historian" come into play. This point has probably been belabored
much too often. It is true, though, you must be able to do your
homework. A "bad" game, in this respect, will not look bad taken
by itself. But compare it to a game on the same subject done with
attention to the historical particulars and the "non-researched"
game usually comes out a decidedly second best. A few examples
of this exist. BARBAROSSA and STALINGRAD both cover the same
situation. Yet few people will insist that STALINGRAD is a better
game. Of course, BARBAROSSA has the advantage of better play
mechanics. But these were developed BECAUSE of what research of
the situation revealed. Another example is BATTLE OF THE BULGE
and BASTOGNE. In this case BULGE has the better play mechanics (or
simpler, at least). Still, BASTOGNE is clearly superior as an
accurate re-creation of the campaign. More examples will come to
light as we design games on situations already covered by Avalon
Hill and other publishers.

Learning how to do historical research is another project unto it-
self. It's not really all that complicated, although it becomes
easier to do and more productive the longer you're at it. This
 certainly does not disqualify amateurs, but you've got to start
somewhere. I started late, not getting into military history and
"science" (there's quite a lot of the technical stuff to be mas-
tered) until I was 18, and in the army. I didn't really get around
to DOING anything with all that acquired trivia until I was 22
years old, when I wrote the ARDENNES OFFENSIVE monograph (which
also got me the job of designing JUTLAND). Still, it took some 500
hours of research to do JUTLAND (although I must admit that I start-
ed with near zero knowledge of naval history, and naval science
turned out to be another field unto itself). If you are willing to
spend the time on it you can research backgrounds for some game sit-
uations in a hundred hours or less, depending on your previous
experience with the subject and material related to it. Of course,
having access to the sort of material published in S&T is a big
help. Once your data is assembled you have to "play" with it.
This is what is usually construed of as "designing". This is also
where you should convert the salient points of your research into
game mechanics. Or, rather, into the important "aspects" of the
game. All is not said in the game's mechanics. Such things as the
scale and scope of the game, not, strictly speaking, mechanics,
must be made to reflect the "points" you wish to emphasize in the
game. This is important. I have mentioned before the importance of
knowing what you want to say in the game, and then trying to say
it. Anyone who tries to create a true "simulation" of an event is
chasing after the "Holy Grail". There are too many limitations in-
herent in the "board game" format. Take a game which did try to
do the impossible, 1914. Very realistic in its way, but how close
did it REALLY come to "simulation"? What it gained in "realism"
(not neccessarily the same as "simulation") was not equal to what
was lost in playability. And, as has been said many times before,
if a lot of people cannot play the game all that you have put in-
to it is lost to a great number of people. As ye sow, so shall ye
reap.

Therefore, except for games with pretty much identical situations, you will have to develop fairly unique elements for each different game. Again, KURSK and 1940 are about as close as you're going to come in the way of "identical" games. And even then there are many very significant differences. The question, now, is exactly how does one build in these "unique elements"? Let's take 1940 and KURSK as examples(this way we examine two games in about the amount of time it takes to do one game). In the last issue we examined the problem of computing the combat factors of the units, using the KURSK units as an example. Mainly a mechanical problem. Of course, one of the "unique features" of both 1940 and KURSK was the "man for man" superiority of the Germans over their enemies. part of this could be seen in the number of weapons each side's units had. The Germans were simply more heavily armed. This advantage tends to snowball. Tactics are important. German tactics were often superior. But this was not the chief German advantage. The main German advantage lay in all the "little" advantages they had. Deciding just how large their "advantage" was has to be done in conjunction with Combat Results Table construction. The CRT will show, in practice, what effect the German advantage has. There are two approaches to the CRT problem, both of which are usually combined before you are finished. The first method is to take the "standard" casualty rates for the period (compiled, usually, from official sources, such as staff officer's manuals for the modern period). This sometimes works the first time around, but not usually. Moreoften you have to go to the second method. This entails compiling casualty figures for the battle itself. In France 1940 the battle was, compared to KURSK, somewhat less bloody. More units were destroyed due to isolation than to violent combat. In KURSK out and out butchery was more the rule. The CRT's , of course, had to reflect these differences. "Victory" is another aspect of a game that changes considerably from situation to situation. Even within the same game, as was the case with KURSK. All this, of course, is just scratching the surface. In future columns we will explore many game elements in more detail. For now, you ought to reflect on what was said this time. Reflection, as much as persistant physical effort, is responsible for bringing a game from one's mind to reality.

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Engineers in Simulations ②

by Stephen B. Patrick

Armies are traditionally divided into combat arms--infantry, armor/cavalry, artillery, engineers, and signals--and technical services--transportation, quartermaster, chemical, and so on. Of the combat arms, war games normally use infantry and armor/cavalry, less frequently artillery, and the last two scarcely at all. For signals this is understandable, as a one-player-per-side game is unsuited for communiations play, except in the broadest sense(delayed orders being the most common).

Engineers, in one form or another, are an ancient institution in military practice, first being used as part of siege operations to undermine fortifications.The normal omission of engineers from wargames is as curious as it is unfortunate, for the use of engineers can add some of the "frictions" of war to a game--both board and miniature--which enhance the much sought after realism aspects.

Engineers can be put into three general groups--light and heavy comstruction, and combat engineers. Among them they account for all of the construction work needed in wartime, including the erection of of buildings, the creation of roads, and the establishment of harbors and airfields, in addition to those functions which are peculiar to the combat engineers. The uses of construction troops in rear areas are so obvious as to need no explanation. The uses of combat engineers, on the other hand, are both relatively more esoteric and, for the wargamer, more valuable for application.

The organization of engineer units seems almost a matter of universal uniformity. The standard unit of organization is the battalion. The construction engineer units are assigned to corps and higher levels, while the combat engineers are normally found in the divisions. This is, of course, in addition to the attachment and support assignments commonly made, which may, for instance, find an army level engineer battalion in support of a line battalion for a particular mission. In fact, this attachment capability is important when dealing with units smaller than battalion since, in the U.S. Army, for example, engineer companies are often attached to brigades and platoons to line battalions in furtherance of the line units' respective missions.

For war game purposes, as indicated above, a particular value is to be found in examining division level combat engineers. In the U.S. Army, this means the engineer battalion with four combat engineer companies and a bridge company. The 1940 German divisional engineer battalion had three engineer companies, one light engineer company, and a bridge company. The premise is the same from army to army: a battalion, generally with more companies than the usual three to be found in line units, and with a bridging capability.

Essentially, the division engineers have the following capabilities: construction, repair and maintenance of roads, bridges, fords, and culverts; support of hasty and deliberate stream crossings; emplacement and removal of obstacles, including mines and booby traps preparation and execution of demolitions, including, in modern warfare, atomic demolition munitions; construction of airlanding facilities; water purification; providing specialized equipment and personnel to facilitate the assault on fortified positions; technical assistance to other division troops in construction of obstacles, fortifications, emplacements, camoflage and deception devices.

The use of engineers which comes most readily to mind for war games is their destruction and obstacle capabilities. For example, with proper use of explosives, any bridge can be blown by combat engineers. This, obviously, slows the enemy advance to the extent that, in crossing a river, they must now find a ford or, if necessary, build a new bridge--which task would fall to the enemy engineer counterparts. While blowing bridges is a function of explosives and time available, and, as such, somewhat variable in timing and effectiveness, the bridging of a river is a more settled matter. Bridging turns, from an engineering point of view, on what is available to bridge the river. The bridge companies are often equipped with a variety of bridge capabilites. In the U.S. Army there is the 18 meter long AVLB, a scissors-type bridge launched from a tracked vehicle (actually, a tank chassis) in the face of possible enemy action. This particular bridge will hold tanks and personnel and allows a rapid crossing with almost no delay. For crossings of greater length, a more time-consuming construction project must be undertaken. However, the bridge company meets this by the pontoon bridge system, which allows,

for example, 100 meters to be bridged by a Mobile Assault Bridge in
20 minutes (a U.S. Army bridge company can actually span a total of
144 meters with MAB, which bridging can carry tanks). Obviously,
more permanent bridges are ultimately necessary and these would fall
to the construction engineers, but the bridge companies can throw a
bridge which can carry tanks and anything smaller across a river as
big as the Rhein in a relatively short time. Obviously, a light
foot bridge can be put up even faster.

To have bridges as a factor for consideration in war games requires
the designation of rivers as fordable or nonfordable and, if nonford-
able, as to width. Fordable rivers can be crossed by units with their
own capabilites. Nonfordable ones require engineer assistance. It
is easy enough to day that when playing with divisional level units,
the division engineers are assumed to be part of the unit. But this
is intellectually lazy, as it allows the commander to omit the
mental step his real-life counter-part had to make--ensuring that the
engineers were actually on the spot, ready to do their job as needed.

Roads, of course, are meant to be cratered. A well cratered road
does wonders to slow the race up and down roads, a particular annoy-
ance in board games. A rather complex formula exists to determine
the charges needed to crater a given road, which is not essential
here. Suffice it to say that a good crater is too wide for a
scissors bridge, too deep and too steep-sided for vehicles to pass
through and tied in to other natural and man-made obstacles. In
practice, cratering involves drilling holes in the road or, if a
culvert exists, making use of that. In addition the ADM will circum-
vent the need for a number of holes very nicely. Essentially, crater-
ing a road requires time, particularly without an ADM. and the scale
of the game must be kept in mind. In most board games, a square
several kilometers in size would require a good day's work to crater.

While construction engineers would build major obstacles, such as
Dragon's Teeth, the combat engineers must breach them. The particular
value of dragon's teeth isthat they must be breached individually if
you are not to make such a crater as to create a new obstacle. This
requires a good deal of emplacing of charges and tends to result in
lanes being made through the teeth (and it also accounts for why long
stretches of the West Wall still exist and the German Federal Republic
doesn't know what to do with them). If, for example, the teeth are
a yard apart and run in bands ten yards deep, to clear a path for
vehicles would require at least a lane three yards wide and that
means at least 20 individual teeth would have to be blown. In
addition, that one lanecanalizes the advance ideally from the
enemy's point of view and it makes it possible to stop the whole
advance by knocking out the lead vehicle while it is still passing
through the belt of teeth.

Minefields come in five types: 1)protective, which provide close-in
protection for small units in the battle areas and is laid on short
notice, for brief periods, contains no booby traps and is removed by
the unit laying it; 2) defensive, which is laid as part of a division
defense plan to strengthen defensive positions and canalize the
enemy, but it is not laid on short notice, contains at least 5%
booby traps, and is normally not removed by the unit laying it;
3) barrier, which is set out at lower authority than division in the
U.S. Army, and is used to cover intervals between strongly defended
localities, to canalize the enemy, and is often laid when hostilities
are imminent and a long defense is necessary(this is well planned in
advance, contains at least 20% booby traps, is is not removed by
the emplacing unit); 4) nuisance, laid on authority of army or

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higher for the purpose of delaying or hindering the enemy advance, particularly common in retrograde actions and laid at bridge approaches,ferry sites, roadblocks,and fords,it is the only one not marked and if possible contains 100% booby trapped mines, and even toxic chemic al mines; 5) phoney, which, as its name implies, is de- signed to deceive,normally used in connection with live mines to,for example, camoflage counterattack routes, it is marked, guarded and authorized in the same manner as the minefield it simulated.Obvious- ly the size of the minefield varies according to the time available to lay it.For example, it takes 445 man hours/100 meters for a bar- rier minefield and 11 manhours/100 meters for a protective minefield. Curiously, clearing one is faster than laying it, though working through an enemy minefield will move more slowly than removing your own. To clear a vehicle lane 3.65m wide requires 27-33 man hours/ 100 meter to locate the mines and somewhat more time to remove them by ropes of explosives. Clearing a lane will take essentially the same amount of time regardless of the type of mine.

Barbed wire is a common barrier when defensive measures come to mind. Again,this barrier is dependant on the type used and how long it will take. A simple four-strand fence takes 200 man hours/300 meters to erect,while the same amount of triple expedient concertina requires but 39 man hours.

These are just the high points of engineer employment, but they should suggest practical use in both board games and miniatures. Moreover, called sappers,they fit into virtually any period of war- fare where the siege was an important element. Therefore, the use of engineers can be applied to virtuallyevery war game, to as great or little extent as you, the commander, wish to make use of them.

Although the United States has not conducted an amphibious landing since In'chon,the fact remains that only the U.S. has an amphibious doctrine tested in successful battle experience. For that reason, when talking about engineers in an amphibious context, discussion must shift from general terms,trying to find the common ground among engineers in all armed forces, to the specific example as used in the only armed forces to successfully employ amphibious (other than cross river) operations.

In this regard, the United States has created a major exception to the general rule that an engineer battalion supports a division.They have created an engineer brigade which is designed to coordinate and control corps level operations and, at the same time, exercise direct control over one to four subordinate engineer amphibious groups. The group exercises the same type of control the brigade does, only within the context of a division and, in its turn, controls one to three subordinate battalions.The battalion supports brigade-level operations and normally contains one engineer amphibian company,designed to conduct normal engineer operations on the beach and in near-beach areas, and two engineer amphibian assault companies designed to conduct operations in the off-shore approaches.

The reason for this exception to normal engineer practice is ap- parent when one considers the nature of amphibious operations. A land force can afford the luxury of either by-passing and operationor slowing its attack in the face of a particularly hard obstacle to remove. Amphibious operations require a great deal of control and, once launched at a given beach, are quite inflexible in that the only alternatives are successful landing or withdrawal.They can't sim- ply slip off to the side and land elsewhere, where they might find

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it convenient. That beign the case, every minute they are either in the water or on the exposed beach, the vulnerability of amphibious forces is for out of the norm. Consequently, it is imperative that the obstacles to landing and moving off the beach be cleared as quickly as possible. As usual, the engineers perform this function and the size of the unit supporting the landing force(e.g. engineer battalion to brigade, rather than the normal company to brigade) reflects the need for intensive concentration of engineer capabilites to accomplish the engineer mission as rapidly and effectively as possible. The types of obstacles which would have to be cleared are readily apparent from any World War II amphibious operation: off-shore obstacles, such as at Normandy, mines and pill boxes come to mind. In passing, it is interesting to note the similarity between the engineer amphibian organization of the brigade-group-battalion-company and the Special Forces A, B and C Team system. The similarity is not true in detail, but the general concept is a rather unusual one in the army, with low level headquarters which are purely administrative in nature.

Whether one can consider twenty-year old doctrine still sound in the light of changes in technology is a moot question. The U.S. Marines are the only forces in this country equipped for amphibious warfare, the Army having long ago disbanded their amphibious capability. The Russians do have some amphibious capability, particularly in their tanks, but this appears to be more of the cross-river variety than ship to shore, as is the case in this country. Whether other countries also have an amphibious doctrine, which may differ from the United States' is likewise a moot question, since no other country has actually had the experience of landing against well prepared positions and being able to form doctrine based on this experience.

THE "BATTALION DAY" (manhours of labor)

A PLATOON has 30 workers. Working a ten hour day this produces 300 manhours per platoon day.

A COMPANY has three working platoons producing 900 manhours per day.

A BATTALION has four working companies producing a 3600 manhour BATTALION DAY.

DESTRUCTION

OBJECT	WEIGHT OF EXPLOSIVE	MANHOURS
Major bridge	.6 tons	30
Bridge under 400'	.4	20
Tunnels	6	50
Crater 2 lane road (1 Km)	.22	20
Crater 4 lane road (1 Km)	.62	40
Major RR Bridge	1.5-2.5tons	60
RR Bridge under 400'	1-1.5	40
RR Terminal	.6	40
30 RR cars & locomotive	.05	40
Airfield Run-way(1000')	2.8	80

FIELD FORTIFICATIONS

TYPE	PROTECTION AGAINST TANKS	SHELL FRAGMENTS	MANHOURS	MATERIALS
Improved crater	none	poor	.5	0
Skirmish trench	none	poor	.5	0
Prone emplacement	none	fair	1.5	0
Open hole with offset	good	good	2-4.6	0-240lbs
Open hole with half cover	fair	very good	2.5-5.5	10-260
Above, with offset	very good	excellent	20-35	120-700
Open 2 man hole	good	good	3-8	0-329
Deepened 2 man hole	good	very good	5-10	0-375
2 man hole with half cover	good	very good	4-10	15-350
Open fighting trench(8m)	fair	fair	21-32	0-710
Covered fighting trench	fair	very good	27-40	0-1060
Open MG nest	good	fair	4-8	0-200
MG nest with .5m cover	none	good	4-7	45-270
MG nest with full cover	fair	very good	9-14	190-890
AT launcher pit	fair	fair	3-6	0-160
81mm mortar pit	none	fair	12	210
107mm mortar pit	none	fair	29	370
1o5mm howitzer pit	none	fair	100	0
155mm howitzer pit	none	fair	170	0

Materials usually consist of revement material to shore up
the sides of the position (thus requiring less work later on
for maintenance) and material to cover the top. Lighter
material used (when possible) was corrugated metal. Other-
wise wood was used.

WIRE ENTANGLEMENTS: Weight of wire, number of stakes and manhours
required to put down one kilometer of the following types of
wire entanglements.

ENTANGLEMENT	WIRE	STAKES	MANHOURS
Double Apron(4+2)	5.4tons	985	195
Double Apron(6+3)	3.65	660	162
High Wire	6.5	655	260
Low Wire(2+4)	3.96	660	162
4 Strand Fence	2.17	335	65
Double Belt	7.6	345	130
Triple Belt	11.4	520	324

MINEFIELDS: Number of mines, manhours and tonnages of mines
required per one kilometer for various types of minefields.

	PROTECTIVE	DEFENSIVE	BARRIER	HARRASSMENT
MINES	2600	20591	23819	51
MANHOURS	370	2420	3213	8
TONNAGES	10.83	74.27	142.37	.42

	DENIAL OF FACILITY(Per facility)	ROAD MINING(Km)
MINES	102	560
MANHOURS	16	71
TONNAGES	.87	2.3

MINE CLEARING

TYPE OF CLEARANCE	WIDTH OF PATH	MANHOURS PER 100 M
Manual-probing	1 meter(footpath)	15-20
Explosives	4 meter	35-40
Detection&probing	4 meter	25-30
Explosives	25 meter	200-225
Bangalore Torpedo	1 meter	3-4

AVERAGE ARTIFICIAL OBSTACLE REQUIREMENT FOR 400 square kilometer
area: in tons of material and battalion days

	TERRAIN STEPPE	ROLLING HILLS	HIGH HILLS (forest)	MOUNTAINS, FOREST (marsh)
DEFENSE				
MATERIAL	2291tons	1948tons	1383tons	827tons
Bn DAYS	16.5	13.3	9.8	6.3
RETREAT				
MATERIAL	655	559	415	301
Bn DAYS	5	4.3	3.6	2.3
OFFENSE				
MATERIAL	72.5	49.7	34.7	30.8
Bn DAYS	.5	.4	.3	.2

BRIDGE BUILDING

TYPE	MANHOURS (per 200 meters)	CONSTRUCTION CREW	CAPACITY
Footbridge	135	30	75 men per minute (day), 40 by night
Assault Bridge	45	30	200 (8 ton) vehicle per hour
Pontoon Bridge	1200	240	400 (60 ton) vehicles per hour

Each of the above also requires a 10 man maintenance detatchment
once constructed. The footbridge requires three trucks to carry
200 meters of bridge, the assault bridge 12 trucks and the
pontoon 50 trucks.

Man hours required to clear, grub, scrape and rough grade a road (4.2 meter road will allow passage of about 1200 tons of truckborne supply per day, enough for one division. A 7.3 meter road will allow 3400 tons of supply per day.) Per mile of road.

Type of Terrain	4.2 meter(one way)	7.3 meter(two way)
Flat(steppe)	1500 manhours	2200 manhours
Rolling	2000	2800
Hilly, forested	2500	3300

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Getting into Tac 13 & 14 ③

by Albert A. Nofi and Arnold J. Hendrick

In the first issue of GAME DESIGN there appeared an article on the design of the S&T games Tac 13 and Tac 14. This article was intended as an introductory discussion of the general problems inherent in designing a game if you are a novice to the field. It was to be followed by another, more detailed "nuts and bolts" article on the actually technical problems encountered. Many people, however, failed to realize that this would be the case and expressed a degree of disatisfaction with the article. One of these was Arnold J. Hendrick, an occassional contributor to S&T. Mr. Hendrick was therefore commissioned to set up a series of questions which he felt were vitally important in understanding how a game such as Tac 13/14 game to pass. Here now are the questions and the answers, by the designer, Albert A. Nofi.

1. The "dispersal"concept in casualty determination is not only new, but highly controversial.One is led to believe that casualties suffered in straight hand-to-hand combat, even when the attacker has 3-1 numerical superiority,are relatively few within the scope of the game (2-5 hours). Historically, what were the casualty rates (show sources for data here too, please), and why is "attrition" losses, even in battles up to 3-1, not represented at all? Finally, what does, historically, a "dispersal" mean?

"Dispersal" is a synthetic condition which represents, as painlessly as possible, the disruptive effects of combat on organization, morale, and manpower when the combat has not been intense engough to destroy the organization permanently. In effect, it represents the time needed to regroup and rest the troops for another try. During this time the unit is highly vulnerable. To be sure, the cumulative effect of a number of dispersals in succession would have a permanent effect on the fighting qualities of a unit, but to attempt to incorporate individual unit losses due to attrition--and all units, whether winners or lossers, would be effected by this-- would tend to complicate the game into unplayability. Even the so-called "roster" system favored by miniatures people runs into undue amounts of time and extensive complications. As "regular" historians often ignore "minor" details--like entire economic elements of a particular war--so too we must, in designing a game which is meant to be both a simulation and a playable war game, make some compromises as well.

2. In Tac13/14 the fire-melee combination attack is obviously the key
to tactical success. Please deomstrate your historical groundings
for making this the single most important concept in the play of the
game.

A quik glance at the record will indicate that the fire-melee combin-
ation was indeed vitally important. Throughout the ancient and
medieval world, if you had missile troops of sufficient efficiency as
to be able to coordinate their actions with your melee troops you
usually won, if you didn't--or you failed to use them even though
they could be so employed--you usually lost. As evidence we may cite
Crassus among the Parthians, Narses in Italy, Edward the First at
Falkirk, his son at Bannockburn, and, just for added emphasis,
Carmagnola at Arbedo and the Spanish triumph at Bicocca. In each
case a well handled combination fire-melee force took on a purely
melee force and creamed it--except at Bannockburn, where an uncoord-
inated fire-melee force was smashed by a bravely led melee force.
Why this sort of thing did not happen more often was primarily
because, in the ancient and medieval worldsthe archers, slingers,
and javelinmen were generally mercenaries rather than regulars. The
Macedonians raised regular missile troops and did very well, and the
English made missile power the backbone of their national army for
over 300 years. In addition, until the English longbow (made from
Italian yew) came along most missile weapons were of rather short
range and low hitting power. In point of fact, English long bows
seem to have been more accurate than musketry for ranges beyond
100 yards or so until the advent of the rifled musket as the standard
military firearm, around 1830-1840. Of course, it is easier, cheaper,
and quicker to train a reasonably good musketeer than to train a
fair bowman.

3.It is quite obvious that a great many intangible morale factors
went into the construction of combat factors in these games. How
else, for instance, do you explain the stack of Barbarian Infantry
being a 12-4-4, while a stack of Roman Swordsmen is a 12-12-4?

Well, this is a juicy one. Now, the key to it all was to determine
the pattern of morale and its influence on combat among the various
types of troops. Then too, there was the importance of coordinated
training to fight in ranks versus superb individual training, but
no coordination with other men. Barbarian Infantry may be taken as
a more or less typical example: In combat these troops lacked one
vital element of motivation, discipline. To be sure they had a
"higher" type of motivation, which may be termed "ascribed" (i.e.
"it has always been thus") and, when a good leader was around, also
"charismatic" (i.e. "get the bastards for Sgt Rock"). Both of these
will carry men forward to successful attainment of victory. Now,
discipline may be termed "beaureacratic" motivation. You do it
because it is your job, and you must do it well. In a reverse, or
in defense it it this last which makes troops hang together and
die to the last man rather than go off for the nearest hills. On
the other hand, the typically barbarian patterns would usually
break down under pressure of reverses or defensive fighting. So,
we find Barbarian Infantry attacking with great <u>elan</u> and enormous
momentum, but Roman infantry is defending with deliberate, discipline
and enormous calm. To be sure the ascribed and charismatic forms
of motivation also helped the Romans but to a less important extent.
Barbarians would never follow an unpopular general, Romans would
have the force of discipline to make them do it.

4. Along the same lines, please explain how you managed to ignore
the problem of individual unit morale.

While the dispersed rule takes care of individual unit efficiency
during a battle, it must be added that this is one of those areas
where, if we tried anything more extensive, we would run into a
serious hinderence to play, without any concomitant return in
realism or simulation authenticity. The elaborate morale rules of
miniature gamers are a case in point. Whether they improve the
game or not is a moot point, they do slow it down enormously and
have a tendencey to make it agonizingly intricate.

5. How did you arrive at movement speeds? Please show me the data
and sources. I am confused as to why whe light cavalry goes but 9,
while medium, or Oriental, cavalry can do 11? Also the difference
between the two types of heavy cavalry, 9 and 7, is confusing. And
finally why the difference in speed among pike, spear, and sword
units.

As for a source, there are several compendium's of military hard
data available, including Wolseley's SOLDIER'S POCKETBOOK and
the appendices to Totten STRATEGOS(formely available through the
Poultron Press). From these we find that troops in fresh condition
move but 2.5 miles per hour, or some 1,600 meters per twenty
minutes. In our games they move but a fourth of this. Why? This
is because we assume an average of 800 meters, road movement, per
twenty minutes due to the tendency of troops to become exhausted
and the diorganization due to combat conditions. For a full day's
march infantry can only make about 12 miles or so, assuming ade-
quate rest periods and much attention being paid to keeping them in
fightin trim. Of course they can do better(check out the ChiComs in
Korea)but how fast would you ably manage it hefting a 21 foot pike or
a few pounds of heavy, hot armor? The difference in troop movement
factors were partially based on available information such as the
ordinary march pace of the Roman armies, the lack of marching pace
in medieval times, and the restoration of marching by the Swiss.

Roman style light cavalry is 1-1-9 because they lacked stirrups, a
capital invention with far reaching consequences (after all,it made
possible the middle ages--just as the humble motion picture made
possible the sexual revolution in conjunction with the mighty auto).
Without stirrups, it is fairly difficult to sit a horse and almost
impossible to fight with shock tactics from one. You are much too
busy staying on the beast to worry about the enemy. In addition,
horses in the West were pretty small compared to the mighty Eastern
breeds, such as Persia's Niseans. This is not to say that good
cavalry, using shock tactics can not be raised without stirrups. It
can--if you have a people who are practically born on horseback,
like Alexander's Companions, or the Persians, or the Huns, and
spent most oftheir time up there. (Indeed the Huns were supposed to
be rather fond of mares. One wonders what the stallions thought
about it all. One wonders what the Hunnish women were like to drive
them to it!) Now, Byzantine heavy cavalry, cataphracts, is not to
be confused with European heavy cavalry, knights. The latter were
truly "heavy", usually going about mounted on Percherons (Budweiser
horses to the uninitiated). They had loads of armored mail, or
plate and an enormous lance. They didn'tmove very fast but they
had tremendous momentum once they did. Byzantines moved faster due
to lighter weight, but relied on a combination of fire-melee rather
than pure shock to win the day.

Just for the record, it might be added that cavalry cannot charge
downhill effectively at anything over 5° of slope and cannot do
so even uphill at anything over 10° of slope. It has to do with
the horse-man combination's center of gravity. If they charge down-
hill they have a tendency to stumble. Try it some time by running

down a 15 or 20 degree slope. Trick camera angles and John Wayne
movies to the contrary cavalry will find itself in trouble when it
charges downhill.
6. In Tac 14, gunpowder arms are quite reliable and do not increase
effectiveness at close range. I seem to recall comments about the
poor reliability, difficulty in transport, and poor long range
accuracy of artillery in this period.

If you check out the rules carefully, you will note that there are
optional situations with which to mess up the cannon. Also, the
range of cannon is, in fact, not overly great. The main improve-
ments in guns between, say 1500 and 1800, were in terms of improved
transport, lighter pieces, and greater accuracy. Tests of cannon
owned by the National Parks Service, and dating from the early
1500s, show that range changed very little, but accuracy beyond
700 meters was pretty poor. So, while they can fire well over 1,000
meters, Tac 14 heavy guns fire to 700 only, and light pieces to but
500. Longbows on hill tops can almost so as well!

7. As everybody knows, Machiavelli's dreams of swordsmen fell
through because gunpowder weapons were so much better. But even the
improved arquebus alone in Tac 14 cannot significantly destroy enemy
units, the fire-melee combination is still necessary. Some people
have questioned the historical validity of this. (This is really
somebody else's question.)

Who is "everybody"? Machiavelli"s ideas about swordsmen were never
tested. His ideas about citizen militias were and proved to be of
very mixed value, doing very well in light action but falling
apart under heavy combat. Remember, that even at Bicocca the
Spanish had swordsmen in reserve and pikemen up front to finish off
whomsoeve of the Swiss as had not yet been slaughtered by the arquebus-
men. An estimated 3,000 Swiss were hacked to pieces in the ditch. The
sword went out because the arquebus-cannon-pike combination was too
much for it. But it only went out partially, for most arquebusmen
and gunners carried one. And pikes saw service in most major
European armies until almost 1700. There still was an occassional
need for them.

8. Why were thre no provisions for mounted commanders in Tac 13?
Why do weak bodyguards and commanders always have to move on foot?
I seem to remember that Caesar in his red cloak got around surpris-
ingly well in battle, even on foot. Why a command unit MF of 4?

You are right on this one. We goofed and will go back three spaces.
Try giving command units an intermediary movement factor of, say
eibher 8 or 9. See how it works out.

9. A good simulation game cantell you a lot about history. Do you
think that players of Tac 13/14 are using tactics and making plays
at all similar to what real commanders made? Many, as their light
cavalry gallops across the front of a line of arquebusiers to swing
around and charge them in the rear, as their men march through a
one hex hole in the line to take that line in the rear, seriously
doubt this.

The abberations which you mentioned were noted in the design of
Tac 13 and Tac 14 fans are advised now, as they were in the Tac 13
rules, to use Tac 13 to modify Tac 14. We caught a lot of the
serious bloopers but neglected the blood thirsty type players who
check out every clause in the rules for a loophole.

Your basic question, however, as to whether people fight the way it was fought is a tough one to try. Some of them do and some of them don't. Usually, we have found that in battles where outright stupidity played an important part on the losing side, like Bannockburn, the Taro, and some others, the original loser has a tendency to win--after all you have to be pretty stupid to lose at the Taro! On the other hand in some battles where a particularly brilliant handling of the victor's troops are responsible for turning the trick we often find the loser winning because the other guy just ain't with it. Once the players read the various analyses of the battles, particularly the Designer's Notes for Tac 14, however, they tend to do the right thing.

10. What further data do you have that was not included in the games for various reasons? Regardless of whether they are playable or not.

Actually, we managed to get just about everything into the rules. To be sure we had to incorporate the Roman javelins in their ordinary combat factor, which is a bit unrealistic, and we ignored certain types of troops, such as Spanish javelin men of the Renaissance, and we left out the Roman campand artillery, as no one ever seems to have successfully stormed a Roman camp and sieges are ridiculously lengthy for the scope of the games.

Well, that about wraps it up. We have in process a series of notes correcting both Tac 13 and Tac 14, and also some bridging rules to bring Tac 14 more in line with the Roman game . In addition there are a number of new scenarios which may see the light of day, among them the strange career of Charles the Rash of Burgundy, and the Black Prince's sojourn in Spain, but nothing very exciting. For excitement go back and try Bicocca--who likes Frenchmen anyway?

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TSG review (4)

The word has been out for a while now that the TSG line was undergoing a general upgrading and revision. This applied not only to new TSG games (like STRATEGY I and KURSK) but also to existing TSG's. One by one, the existing TSG's will be revised and upgraded to the new standards. This means (as you can see in KURSK and STRATEGY I) die-cut counters and high quality rules and playing surface. New counters and maps are really no problem. That's a fairly mechanical problem. New rules are something else again. The first game to be converted is KOREA (which will be available for shipment towards the end of June).

Hopefully, within the next year, all of the remaining TSG's will be converted. In addition, a few games will be dropped. ITALY will be dropped because, in the long run, it's similarity to ANZIO was so close that ITALY's sales have become almost insignificant. ITALY may be redesigned and reissued later, insofar as Avalon Hill is dropping ANZIO from their line in a year or so (as soon as current stocks are exhausted). 12 O CLOCK HIGH is also being dropped, as will FLYING FORTRESS II, both on account of AH's publishing LUFTWAFFE (a cleaned up 12 O Clock High). Tac 3 and FLYING FORTRESS may also be dropped, although it appears that their sales were not affected that greatly by the publication of PANZER-BLITZ and LUFTWAFFE.

Revising games is a tricky business. KOREA was certainly no exception to the rule. KOREA, of course, suffered from more than its share of faults in the first edition. Like all the other "first wave" TSG's, KOREA was produced under great pressure and with limited resources. A lot of mistakes crept into the game rules.This is particularly vexatious for the KOREA game as it was, to put it mildly, a difficult situation to translate into game form. For you had a fully mechanized army facing an infantry army on some of the nastiest terrain in the world (that from personal experience). Add to that a hazy political situation and the clash of radically different tactical systems, plus the need to take into account sea and air power plus amphibious operations, and you have an idea of just what we were up against. The biggest problem with the first edition of the game was in the often haphazard manner with which widely disparate, but critical, parts of the game interacted. One of the more vexatious problems to come out of this was the ambiguity (not to mention sheer confusion) of the supply rules. This was easily cleared up in the revised rules. What was not expected was the maze of changes required to give each of the three separate games the maximum amount of realism. The original situations were realistic enough, there were few complaints about them. We had spent a considerable amount of time in drawing up these situations originally. But after some "minor" changes in the rules (such as cleaning up the supply rules) we found that the special rules governing each of the situations had to be completely redone. The Chinese Intervention scenario in particular had to be carefully handled. Give the Chinese too much of an advantage and there is soon no UN army at all left. Don't give the Chinese enough and they never get anywhere. Of course, odd things can still happen in the game. This is mainly because we use "maximize" approach to playtesting. That is, whoever is playing the games "maximizes" each side's moves so as to get the most out of each side's capabilities. If something goes wrong (such as the Chinese getting into Soul by turn four) with both side's moves being maximized then changes are made in the situation. Once a "balance" has been achieved the game is played out a few times to double check. If the check holds the game is ready to go. Some may say, "Why don't we publish the playtester's moves in his perfect (maximized) games?" Mainly because it would take up too much space and be rather dry reading . Such a discourse would not specify a single course of action but rather a rather complex "system" of actions and reactions for both sides. On top of that it would take considerable time and effort on our part to get it all down on paper. The time could be better spent preparing new games. Besides, one of the purposes of getting a game is so that you can have a crack at "solving" the game yourself. One final note, Omar DeWitt's AH REVIEW column was supposed to have appeared here this issue.We ran out of space and it will appear in the next issue.