"Born in data—forged in steel—and meant to remain true

BRL 1192

RESOURCE GUIDE 1.1

www.BRL1192.com

In the early 1970's an innovater and ordnance expert named Harold came along and got his hands on a document unseen outside of military circles: BRL 1192. The data within became the core of the ground-breaking design that preceded every other major tactical-level system and won BOARD WARGAME OF THE YEAR, after its release. Years later, an MIT-grad and devotee named Brian came along and saw the potential of reverse-engineering the 'programmed instruction' rules, and was himself, soon in the company of a publisher named Ray, that owned the original as his first board wargame. The result is something that brings back the approach to tank vs. tank warfare, and keeps the approach true—while working in the enhancements, to create a truly unique system of recreating the war in North Africa and beyond.

In the years since the publication of TOBRUK, a variety of other systems have come to the fore. None use the methodology found in the system founded on and represented in BRL 1192. Some enhancements to game play were introduced in the years that followed the original publication, and were embraced by the designer. These have been judiciously reviewed, and folded in, to BRL1192 to craft a new experience, devoted to but not shackled by outdated notions: yet familiar to hobbyists that enjoyed the work that preceded it all.

Desert Fox Tip

Separate all your marker counters by category in a Plano® or similar container. Then, when you need a marker of a specific type, you can grab it quickly and keep the game moving forward at a brisk pace.

BRL 1192 provides a vast collection of markers, replacing most needs for side-notes and speeding up play.

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Scale of BRL 1192: Each personnel counter represents a squad, crew or HQ group of 1-2 officers. Each non-personnel counter represents a single AFV, vehicle, or weapon. Each hex is 75 yards across. Each turn represents and about 30 seconds of real time, depending on how much action transpires.

DTT Scale: The scale of Double Time Tobruk is altered to represent 40 meters per hex and about 60 seconds of real time, depending on how much action transpires.

MUSINGS AND INTRO TO BRL

IN THE BEGINNING

In a magazine, published long ago (in 1976), author Mark Saha said:

"*Tobruk* is the first board wargame—to the best of my knowledge the *only* board wargame—that shows what a 'close-up' tank battle is really like"

According to author Paul Carrell, 'in a depression among the sand dunes before El Agheila, on the western frontier of Cyrenaica, lay a British reconnaissance patrol':

Lieutenant Fred Miller dozed in the silent night near El Agheila. All he could hear was the snoring of his comrades. And at that moment the war began to "breathe" again.

The clank of tank tracks... Then silence and an oath. Fred Miller was on the alert, but there was no need for him to wake the others. Clark, too, was peering out from under the scout car. They lay on their bellies and stared ahead at the mighty shadows, which rattled as they moved. They heard shouts. "Tanks," whispered Miller, "German tanks." The monsters drove past 30 yards away in a southerly direction. "One, two, three, four, five..." Clark stopped counting. The sixth veered and made directly for them. The commander was standing in the turret. He had spotted them. "Move off," yelled Clark. The driver and wireless operator were already in the car. The self-starter hesitated. "Get cracking, man!" At last. The rattling shadow was almost on them as they drove off. The desert suddenly sprang to life, the shadows coming from all directions.

FOXES OF THE DESERT

WHITHER TOBRUK?

Many readers are aware of the trajectory of what followed the release of ADVANCED TOBRUK. Growth into a system known as ATS that superseded the publisher's *Combat!* game system. That last, the adoption of ATS over *Combat!* caused no small amount of consternation, most notably a few grown men declaring this and that, an early internet version of the 'boycott' called for until we 'went back', and such. One on the creative end of the spectrum must love the dark side of the passion that drives interest. Must. Love. It. But must also ignore it, as it is a form of group think, a 'gang' as it may be, in the sense of a collection of people, albeit some of them anonymous, that try and use force of numbers to browbeat, drown out, and otherwise act in an overbearing manner to stomp their feet and 'get their (collective) way'. The science relating to this behavior was non-existent at the time, and is only now catching up as big business and government gets interesting in the side effects of false Yelp® reviews, pumping up ratings, tearing down competitors, and such. That is a conversation for another time.

The end result of the 'switch' was the birth of a new system, one a nomination for a Charles Roberts Award (nice) for best World War II Board Wargame, and a nomination for the publisher into the industry's Hall of Fame (also nice). These 'nice' things are ancillary, the thrust being on the attraction ATS had on others, via play, adoption as 'their' system, VASSAL submissions, and design submissions. Dozens of releases follow and the system continues to thrive.

So 'why am I here?' the read may ask. A very fair question. Prior to leaving us, Hal worked up a complete set of reports for the weaponry of World War II, along the lines of the Damage Tables used in TOBRUK. To this day, those remain singular, as all systems that followed from his work adopt simpler, dicey-er if I may, approaches to resolving ordnance vs. AFV warfare. No slight intended, the writer has greatly enjoyed those dicey-er systems, brought one of his own to the fore as a publisher. But still, those Damage Tables lingered.

Along came an MIT grad named Brian McCue, Ph.D. Seems he had been poring over the original TOBRUK for years and had reverse-engineered its guts. Would we be interested in his 'Deprogrammed' rules-set? The short answer was 'yes', and we began corresponding, later exchanging versions. The process went on and we hung a 'Tobruk Deprogrammed' rulebook at our site. Never printed, never billed, booked some advance order interest. Allowed the thing to percolate. And percolate. The idea of a one-off rulebook, print, ship, done with it, tie up a loose end from the past and make something interesting for devotees of the original game. At least that was the idea.

Along the way to the 'light' option, as described above, a funny thing happened. Brian's enthusiasm for the original began a process of transference. And some thinking. Perhaps, just perhaps, smoothing away all the intricate detail of the original, for a larger audience, left another, more involved gamer out. Guys … like … Brian. Perhaps we could make game play smoother, but not remove the ability to 'count every rifle'. Perhaps another review of the articles, the changes Hock was willing to embrace, was called for. And I can say with absolute certainty, Hal did not adopt changes to this work readily: he needed to be convinced with valid arguments. So a new review but this writer, whom also wears the publisher hat, was begun while the back-and-forth of Tobruk Deprogrammed was taking place, in parallel.

In order for the material to remain true to its core foundation: the AFV Damage Tables, until the very end Brian was not brought into the thoughts of expanding beyond the Battle of Gazala. In this way, a clean-room of design was established and maintained. And his work would not have its trajectory altered in any way. So a disclaimer is in order here: everything that the reader feels is pure and true, truly original, is credit to Brian. All changes adopted (more on these later), good, heretical, or indifferent, the fault (or credit) to this writer and developer. So new Damage Tables were incorporated. The expanded HE Damage Table. All signed-off on by Hal years ago, during the days of give-and-take in The General and correspondence. Speaking of correspondence, prior to exiting the battlefield of this world, Hal equipped me with a file filled with his letters, letters to him, and permission to publish—some have seen the light of day—some yet to come. All TOBRUK related, sorry, the 'juiciest' material relates to AFV knock-out odds and such.

So the DEPRO approach grew from just a reorganized rulebook replacement … to a relaunch of the game. Tables were added. Charts re-done. Scenarios laid out on their own dis-

crete cards to allow for 'laying out the counters' and such. An expanded, perhaps more muscular edition. Obviously a far cry from just a rulebook. Then the fun began. And it began innocently enough. As a review of expansions began, the addition of new counters followed. An AFV here, new marker there. The original TOBRUK had two counter sheets, a total of 504 counters on two sheets. All of the counters were of the ½" variety. About half of them had blank backs. The new edition was aimed to come in around the same quantity of counters, again, easy enough. Not so fast. As things percolated, it became clear that the AFVs and ordnance would be easier to play with in a larger, 5/8" counter size. An obvious enhancement. Reducing the need to use written records, while still remaining true to their implementation, more counters. Before it was all said and done, the game became a monster … as in SIX full counter sheets. With the different layout of our counter sheets (e.g., 280 × ½" and 176 × 5/8"), the counter collection came out to be … a total of 1192 counters. An interesting coincidence, since the basis of Hal's design was his ability, as a Pentagon ordnance and weapons specialist (that briefed personages such as former Secretary of Defense Caspar 'Cap' Weinberger as part of Hal's day job; Harold 'Hal', Caspar 'Cap', is there some trend here? Ed.) to get Ballistics Research Lab report 1192, aka BRL 1192, de-classified (*"I was the first person to get that report declassified", Hal Hock*) so that its data could be analyzed. Ballistics Research Lab was based at Aberdeen Proving Ground, in Maryland, and was the center for the United States Army's research efforts in ballistics. They conducted a vulnerability/lethality analysis after World War II on the weapons-system of that conflict. Ballistics Research Lab is no more. Years ago (in 1992 to be exact), the functionality, personnel and offices were folded into the Army Research Laboratory.

A total of 1192 counters, a system that emerged from one man's access-to, and analysis-of BRL 1192. What else would it take … eleven hundred ninety two hammers to strike on in the head … before an idea 'light bulb' would light up? A moment to look back on Hock's era in board wargaming. Hal was not part of the 'insider' network at the time. While we know they did not enforce conformity in the manner of today social media/internet message board group think, we know the industry was dominated sales-wise by SPI. The 'higher ground' presentation-wise was claimed by AH. And this writer can tell you, years after the demise of SPI, that the top guy at AH still referred to the competition from upstart SPI (in a personal comment made in late 1997). The top 'tactical-level' game was Panzerblitz™. NATO symbols abounded on the game chits in almost every board wargame (note: practically all). In comes Hock, an outsider, and outlier as it may be. But one that somehow gets his *oeuvre* published.

In the aforementioned, 'long ago' magazine article, author Mark Saha said:

"When a tank receives a hit in a Tobruk game, an incredible number of different results can occur."

These results can and do range from a ricochet, to individual crew casualties, to mobility and firepower kills, knockouts, and possible internal explosions. Another possible outcome from a hit, not mentioned, is the possibility that an AFV will decide to up and withdraw from the field of battle, no matter the desire of the 'hand that rocks the cradle', the omniscient wargamer human. Crews may also bail out. Infantry, riding the tank may hit the deck or take casualties as a result of this very same 'hit' in game terms. The validity of the outcome-based armor combat system was marveled at 'back then'. Gamers were moved to easier systems for obvious commercial reasons. But the validity of the core approach never budged. A few questions came, aptly parried by Hock himself. And then the easier, more commercially viable games won out and the 'hard', 'intricate' simulation, Tobruk, was set aside.

Fast forward 40 years. Its not 1976 any longer. Another of wargaming's finest men, the designer of that 'easier' game Squad Leader™, John Hill, is also gone. His game was the basis of a commercially successful system that eventually grew from being worked through a 36 page rulebook … to a massive tome. Most know the history, and if not, there are acolytes to drum-head their points-of-view online aplenty. But there are also a few, one recent that called Tobruk the "finest wargame ever published" that we speak to. See, in the final analysis, *Tobruk* was deemed to intricate to build on. Extrapolate that viewpoint, and perhaps, just maybe, you, the target audience was just not *smart* enough to assimilate it. Perhaps Hock's system was not embraced on purely commercial ground? Creative? Personal? Who knows. Who cares. What we care about is potential. The potential to revisit, support, build-on, yet remain true to core concepts. Those things transcend personal opinions, online group think, and all that. They require exactly two men: one, a publisher that truly loves and supports a work; and two, a man that feels the same way and wants to give it a try (or a fresh, new look). In today's world o boutique publishing, Kindle™ and other online books, no author, no creative, needs the support of 'the mob' to bring their *muse* to the fore. No longer. And perhaps you, the reader, are learning that all the hustle and bustle, the angst at major, publicly traded multinational corporations, the halls of Congress … and much smaller entities … over the 'damage' done by 'trolls', false reviews, the latest scandal in China over 'brushing' (Wall Street Journal, March 2, 2015: *"Typically, vendors pay brushers the cost of the products they are ordering, plus a fee. The brushers place the orders and make payments using that money. The vendors then ship boxes that are empty or full of worthless trinkets, while the brushers write glowing reviews."*) is going to eventually be for naught, human beings making 'noise' for their own purposes. Read on.

Before the reader gets the idea that the result of all this is some hide-bound 'virtual photocopy' of a past work, halt your tank in its tracks here and now. Let's rattle our treads back to that 1976 article (*if you don't know by now we continue to refer to Fire and Movement #1*). In a sidebar about the rulebooks from back then, owners were urged along the following lines,

"…the best thing to be said for the old book is that you should destroy it as soon as possible. There are over 65 basic game changes, …. in short, not one single word or number in the old book can be trusted, unless you can verify it in the new edition."

What the above means is that the process of developing the system forward was already underway. That the designer was open to such movement. And looking at what changed, and what remained, is simple. Finding and implementing errata, also, rather simple. There wasn't much of the latter. The most important element here is establishing the 'willingness to be open to development' *bonafides*. We can offer up a direct quote from Hal, as this was discussed. But for post-facto thought, have extant, written evidence to back this premise up. So what to do?

The first steps included a reading of the entire Tobruk rulebook, followed by additional, full read-throughs. Then do the same for the DEPRO version. All available commentary was de-archived, printed out, and read through. As this all took place the answers revealed themselves. TOBRUK depicted the Battle of Gazala, no small feat. This depiction included all of the elements of combined-arms warfare at this scale: tanks, guns, machine-guns, mortars, artillery (including off board artillery, which brought in a subsystem

of forward observation, and light artillery in the form of mortars), and air support. Also part of the core rules-set was a bevy of field fortifications, your basic slit trenches (hedgehogs), anti-tank ditches, minefields, and weapon pits. The entire thing was and is rather robust. And just as important: FLEXIBILE. Following the game's publication, the designer came forward and ably defended his work in a variety of print settings. All good. But he also began the process of expansion … with the first terrain rules. New Damage Tables. Some additional functionality. And based on what is deemed a 'keeper', BRL 1192-wise, an entire collection of reports to make new Damage Tables for a collection of World War II targets.

BRL 1192 FORWARD

After a full review it was patently obvious that nothing whatsoever held the system back from depicting any battle from North Africa. And that said rules-set should be a system named 'BRL 1192'. Not … exactly … 'catchy' … but no one is selling vitamin supplements, or the latest burger. So 'sexy' or 'popular' names are allowed to be off the table. The modicum of terrain introduced, plus the existing line-of-sight model, makes for linear extrapolation to depict ridges 'up' and wadis 'down' (at a later date). A review of core system functionality is in order.

The AFV Damage Tables are sacrosanct. There, it has been said. Note that Hal changed their presentation somewhat in his expansion, but they work the same (and that latter presentation is carried forward in the form of the Supplemental Damage Table). There is NO CHANGE in the possible outcomes, nor results of those outcomes. The system is just too singular, and has a delightfully 'retro' feel to it, using 6-sided dice and all.

The Hit Probability Table (HPT) is sacrosanct. More tables have been added to the two-sided folding play aid known as the HPT, but it works elegantly. It has lots of 'granularity' built in. And is rather simple to grasp. The original game had a bevy of Hit Probability Number (HPN) changes, which can also be codified as HPT modifiers (the former changing the actual hit probability NUMBER; the latter being added or subtracted to the DICE ROLL used on the HPT), they have the same function. These have been collected as tables on the HPT play aid card, making play a lot easier. New units have also been added to the HPT for each side, and this format is scalable going forward as it stands.

The infantry combat system is elegant and simple. One basically 'counts rifles' (or in the case of LMG groups, other light arms are 'baked' in to the gunfire factors) on a table, and makes a roll for the outcome in terms of casualties, on the Casualty Table. Make note that the outcome of Gunfire Factor (GF) attacks are randomized by a die roll on the Casualty Table. More on this later. The casualties system, also linear, and connected to a morale system that has morale checked upon the receipt of casualties. The use of a separate Roster Chart, for marking off casualties, remains available. But a system of markers is also provided, along with a full strength 'man count' number on the front AND back—the latter after deducting 4 casualties—the sum total of one 'fully rotated' casualty marker. Each of those has four numbers, and the current, in-force figure on the counter is rotated to 12 o'clock position. This same functionality is used on the BOT acquisition markers, more on those later.

A key aspect of the system that is unchanged is the difference, in some cases vast difference, between 'initial' and 'acquired' rate-of-fire (ROF). Once a target is hit using direct fire it is 'acquired', and the post World War II concept of 'burst on target' (BOT) applies—along with the idea that once it, your gunners are 'pouring it on'. The previous method has players recording this information on a Target and Damage Roster form. That remains, and an updated form is provided (and available for unlimited downloads). However, once again a new marker-based subsystem is provided to replace this function, the side-note, with an ACQ marker. These are also rotated, to have the I.D. number of the firing unit at 12 o'clock. Side note, markers, the players make the choice—or can use both as they see fit. Either way, the IN/ACQ ROF system and the ability to use acquired rate-of-fire is sacrosanct and remains unchanged.

A collection of very useful tables is found on pages 34-35 of the old book. These deserved to be consolidated on a play aid card and have been. The same goes for the many tables sprinkled throughout the original book, noting that some of these had to be discarded, since they were superseded by later versions due to the Programmed Instruction (PI) methodology used previously. Other tables are also sacrosanct, the Bail Out Table, for example. Another table, and its elegant functionality, seems to have been missed in past articles. Specifically, the Direct Hit Results for Non-AFV Vehicles tables covers the results of direct fire against all lightly armored vehicles (presumably, an average of 1-2mm or armor throughout) and soft-skins. This table can be scaled up infinitely to include other vehicles and vehicle types and streamlines things a great deal. The Direct Hits on Weapons < 40mm table works in a similar manner, and also groups an entire target class on to one table with obvious, useful benefits.

The offboard artillery (OBA) system was ground-breaking in its day and remains one of the most detailed and elegant depictions of this complex subject to date. An artillerist can really wrap his mind around the forward observer's (FO) capabilities, and the system really is super-detailed. The only changes needed represent more marker utilization, as now instead of just making a side-note, a physical counter is placed in a hex for acquisition spotting rounds, fire-for-effect, and markers for the myriad types of FFE's are included, barrages, registrations, concentrations and the like—are provided offboard batteries in the scenario special rules (SSR) for an action. Mortars also include their own IN/ACQ markers, again obviating the need for side-notes, and looking back and forth between your sheet and the board … and 'remembering' what is taking place in empty hexes—that are actually being bombarded—with flying lead.

The Indirect Fire system remains unchanged in its core functionality but that doesn't mean it isn't tweaked. We've noted the similarities, plus the upgrades in the form of markers. The Target and Damage Roster also has the discrete ARTY IND FIRE ROSTER portion with acquisition turn-based circles to fill in—like taking the SAT—for added convenience. But where the difference lies is in the addition of randomized outcomes for indirect HE fire. Whereas before, one simply 'tallied up' the 'fragmentation factors' that could be applied to attack a target out in the open by ordnance that would otherwise be subject to using the HPT to obtain a 'hit' …. All direct fire AND indirect fire that uses the HPT now requires a hit be obtained first. This brings some added uncertainty into the simulation, making the gamer somewhat less than 'all powerful'. Hits reduce cover, as usual. And now, the difference between an outright miss (no effect) and a 'near miss' (uses the existing collateral damage methodology) if differentiated. All via a roll of the dice, using all of the already-existing parameters that make things easier … or harder to hit.

BATTLEFIELD SCALABILITY

A separate section is reserved here to discuss the approach to scaling up the BRL 1192 battlefield. We shall begin with the boards presented in the core game. The old TOBRUK provided three non-geomorphic 8" × 22"

boards with discrete sections labeled 'A' through 'E'. Section A and D were two 8" × 11" halves of the same folding board. These boards could only be laid out in one way, and the only variability that could be provided the scenario designer consisted of refraining from the use of one or more sections, or entire boards. However, since panel B-E was a discrete center panel, it had to always be mated to A-D and/or C-F. There was never to be an A-D + C-F combination, not that such an apparent limitation mattered much in real-game play.

A more glaring limitation on the old board arrangement consisted of its lack of sighting dots, aka 'center dots'. The idea of finding the 'approximate center' of a hex seems easy enough. And likely is not a problem among gentleman. But in the years that followed, a wargamer reportedly 'won' the first SL Origins tournament using the sideways 'crab walk' for a tank, since such movement was not specifically enjoined in the 1st Edition SL rules. Where Hal would stand on sideways-moving tanks can be inferred from the following:

Q. Can captured personnel be executed to obtain higher point tallies for completely destroyed units?

Hock: Absolutely not. Good Lord!

It appears safe to say that Hal would not agree with crab-walking tanks (i.e., rules lawyering) for the simplest of reasons: tanks didn't move sideways. And although the game of note depicts Second World War armored fighting vehicles, a salient fact is: they still don't move sideways. Alas, for modern (gaming) man, we need to close loopholes, as rules lawyers, and their internet cousins, rules (and minor typo) trolls, love to find any perceived chink in the armor and hoist their banners, 'momma, look at me smarter than a fifth grader' and such. We know YOU, the reader, can be explicitly trusted to find the 'approximate center' of an otherwise unmarked hexagon in a game/simulation setting. Or agree on one. But perhaps that makes you rather 'old school' (we admire you, nonetheless). To that end, each hex on BRL 1192 boards sports it own bright-white center dot for LOS sighting purposes. Pulling tongue back out of cheek, these do make game play much easier, as well as remove ambiguity and any fodder for a kerfuffle.

Another issue with the old boards is more vexing, as in much more. Each hex had its own discrete hex I.D. Nothing ground-breaking there. Bit discerning the actual hex I.D. of a particular hex required cross-referencing a letter I.D. along one edge of panel A-D or C-F, with another, number I.D. provided along the TOP of sections A-B-C (1-35) and the BOTTOM of sections D-E-F (20-35). To this day it is rather mind-numbing to peruse, let alone find many individual hexes that are keyed to scenario set-ups. Worse, much of the records-keeping ALSO involves listing individual hexes. As in MUCH worse. To that end, all BRL 1192 hexes have a discrete hexagon I.D. printed IN its hex, along with a center-dot. No one is claiming this is a ground-breaking alteration; just an obvious solution to a problem.

All of the preceding comments on board changes brings us to the most significant change of all: geomorphic boards over 'one off' boards. The panels used in BRL 1192 play are all folding geomorphic panels, each sized 11" × 16". They represent MORE board area than the previous game, although that is not their primary characteristic. The reality of geo-boards is flexibility AND scalability. In the first, they can be rotated on any edge and still link, creating more map permutations. Larger, or smaller battlefields can be created at will. More so since there is a kit available that adds more panels to go with the DOUBLE TIME TOBRUK (DTT) rules that are now part of the main system. DTT does what it implies, increases the playing areas—speeds things up—and is based on the old Mark Saha 'Tobruk X3' article from The General. Notably, Saha was also the author of the material found in *Fire & Movement* magazine, and had a solid grasp on the game and its mechanics. Based on the former limitations, '2X' required one to buy Panzerblitz™ board blanks, then cobble together an enlarged battlefield based on Mark's article. That was then. Now, with a more or less linear approach called for to satisfy our modern gamer, panels are provided for the enlarged playing area. DTT also moves the range to 40 meters, a 2:1 difference.

The scalability of the new geomorphic boards allows for a smooth use of DTT. Ease of use for DTT allows for a build-up of some additional terrain types. And now one of the former beefs with the game, the question of pace, is eliminated. All while remaining true to the system and its concepts.

FACE THE ENEMY

The manner in which direct hits affect AFVs is an integral part of the system and has been since day one. Earlier in this piece the incredible amount of detail, as shown by the different outcomes of one 'hit' on an AFV, was mentioned (with a quote). A specific facing and aspect is hit, results are determined using the Damage Tables, cross-referencing the weapon (and ammunition type) firing with the facing/aspect combination of the target. It is 'in' these row/column combinations, each results 'box' that the system-specific magic occurs. K-kill probabilities, crew casualties, and resulting bail outs, all folded into the possible outcomes. Riders on a tank can be hit by shrapnel. Track hits can occur. Optics smashed. And the 'commander' inside an AFV may decide to withdraw from the battlefield, no matter how the omniscient gamer feels about the situation.

One author made a stirring case for AFVs (and by extension, on board artillery and ATGs) to face a discrete hexside. This is as compared to a hexside. Some points in that case are agreed-on. But in the main, a shift to hex SPINE facing in the BRL 1192 edition is two-fold. Vehicles have more flexibility to move more realistically, without zig-zagging like a U-boat … when they can move forward into the front-facing hexes of their vehicle covered arc (or in reverse to the rear-facing ones). Also, a tank pivots one hexspine a total of 45-degrees, instead of 60-degrees for a full hexside, making them less vulnerable in individual pivot iterations. This is more important now since the 'best aspect' rule (a period-piece of rules where counters were 'dragged back' to former hexes that represented more vulnerable facings) has been converted into a more modern 'opportunity fire' rule. And a live opportunity fire rule, making the battlefield more hectic, by adding an exciting 'real time' combat feel that literally allows firing to occur WHILE movement is occurring. Front, flank and rear facing rules otherwise remain the same as do the results of facing/aspect vulnerabilities.

ADDITIONAL NOTES

Some additional tweaks and changes deserve mention. The whiff of leadership has entered the system as 1-2 man HQ units now allow infantry to move an additional hex when running, using assault, or crawling (the last by crawling one hex per turn). The aircraft model has been expanded with new types (including a spotter *Storch* that conveniently carries an FO … or the Desert Fox himself via simple SSR). Tank overruns are now firepower-based, much easier to manage and implement. There *were* turret rules, based on making a side-record … or an 'assumption' based on previous target. See the comments on 'approximate' hex-center, then see the fleshed out turret rules, plus snazzy new turret counters.

There are new aircraft counters, all working within the framework of rules created to depict that ubiquitous ground-support plane, the

Stuka. Extra additions to the Off-Board Artillery Direct Hit and Fragmentation Table were all that was called for, to account for additional bombs loads and types More detail, no cost in terms of rules overhead. The previous game had AA fire, all good. Now, aircraft do not just go poof! In fact, in most all tactical-level systems what goes up does not necessarily come down. In BRL 1192 play, shoot down a plane … get a plane crash. And a pall of smoke from the wreck.

The mechanics of emplacements was and remains elegant. Adding sangars, a minor form of weapon pit was a no cost addition. Blockhouses get their own counters now, in the event scenario play involves both blockhouses and bunkers (e.g., Tobruk line, circa 1941). Rules for 'broken terrain' were added by Hal in an article in The General. New 5/8" counters, using the values suggested by Hock, replace the need to 'pencil' anything on your boards. Same with the terrain called 'ridges', also requiring your trusty pencil as suggested, but now replaced by terrain overlays and a slight fleshing-out of the rules. Plus a Hillock Summit is added, via counter, for those unique 'high points' (think Point 186 at Bir Hacheim). Previously, movement arrow markers could do double-duty as dust plumes behind moving tanks. New, discrete markers for this function replace that approach and can be used to differentiate between moving units that hurl up dust and those that don't. The affects of 'aerosols', as codified in Hock's un-published book 'Steel on Steel', come into play as global 'dust' effects on LOS and fire; as well as sun blindness.

THE TRAIL OF THE FOX

Players of the former game will find enough new in BRL 1192 to make the latter qualify as a new system. That's may be patently clear. What must be stated explicitly is the approach, going forward, to follow, literally, along 'the trail of the fox' … as in Erwin Rommel, the Desert Fox. A case has been made here that the system has proven itself capable of depicting a multitude of desert battles, not just the Battle of Gazala. To that end, a series of releases are available and coming to do just that. With the aim of creating a large library of North Africa-themed releases, radiating back in time, and forward, from the mid-point represented by May 1942.

Growth is good when it rewards the investment in time and funds that are entailed when immersing one's self in a new gaming endeavor. Especially with the choices available. As this project moved forward, it became clear that it demanded more than just a 'one off' approach. So YOUR investment will be match and exceeded by the publisher. That has already happened, as you already know, with an explosive growth in components since inception. What you do not know, what is about to be made CLEAR is the following:

UPDATE: 2019

A lot has happened since the TOBRUK DEPRO effort launched BRL 1192. And progress continues to be in hand, with the update of the system in hand for February 2019.

Back when, as in way back when, Hal Hock never got the work to leap the hurdle represented by terrain. His brilliance translated to analysis, ordnance comparisons and a groundbreaking infantry warfare system, hidden beneath a gem of a tank combat system. But truth be told, his state-of-the-art efforts to 'add terrain' to the boards of Tobruk consisted of an article in The General, suggesting rough terrain, a contour here and there, be drawn on to those old AH hard-boards using a soft pencil. Most of what represented 'terrain' was invisible: tanks could roll up some hull defilade on the assumption that there indeed were some contours... and thus some terrain 'down there'.

Things have come a long way since then and no firm has been more prolific in the translation of Army Map Service topo maps and aerial photos into tactical-level battlefields. And since SL is to many 'Tobruk with less detail', the scaled maps bring the unfulfilled Hockian dream of terrain ... to life.

Duly, since the first edition of the BRL 1192 Resource Guide (ver. 1.0) was published, the system has journeyed into the realm of historical battlefields. The DTT approach, an outgrowth of suggestions by Lorrin Bird, years ago ... fits the bill when it comes to fitting the scenarios presented with the historical maps into the time-frame and terrain. After all, playability does count for something, even to an old grognard Tobrukker that was never put off by the earlier game's 'wristage' (dice rolling).

What BRL 1192 offers that NO OTHER tactical-level system offers... at least one that does not require the investment of thousands of dollars and thousands of hours painting miniatures... IS... the ability to fight out, and thus EXPERIENCE ... war at this level where each man, every casualty ... can make or break a force. It is this 'granularity', ultimate detail that separates BRL 1192 from other systems, with no knock intended on others, including those published by and supported by the publisher.

The first forays of BRL 1192 beyond the CORE Gazala materials followed that approach and consisted of geomorphic boards, so familiar to the original Tobruk player. Add some overlays and the presentation was complete for that phase of the system's life cycle.

We did not ask you to draw wadis on the boards!

With expansions that covered American entry into the war, El Alamein actions, and a couple of early war treatments, a counter collection was built. And along with it an AFV Damage Table set, plus updated Casualties Table (thank you Don!)

The counter collection on hand was provided over the course of a number of different releases. What is now known as the CORE 6 (#1-2-3-4-5-6) was provided with TOBRUK DEPROGRAMMED/BRL 1192 CORE. The El Alamein sheet (#7) was provided with the El Alamein expansions. Sheet #8 came with the Benghazi Handicap and Electric Whiskers expansion. The French Infantry and AFV sheet is not shown at this time as they are out of stock. The sheets listed as #9 and #10 came with the Kasserine expansion. Sheets ##11-12-13-14 are not required for play and were provided in various incentives as extras, to enhance play.

To make it easier to get into BRL 1192, the sheets shown in the info-graphic are numbered, and have product skus at our site - with a "BRL" before the number. If you want to play a particular historical module for the system, you'll find a list of the sheets needed to play it. And the bonus is that owners of BRL 1192 releases will most likely ALREADY OWN these sheets, allowing them to dive into new battlefields without any fuss or muss. And picking up an extra sheet or two, needed, is also clear and linear.

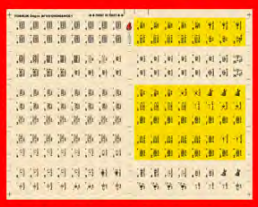
Two brand new BRL 1192 historical modules, building on the North Africa collection—are shipping for February 2019. HILL 609: THE ROAD TO MATEUR is set in Tunisia, circa April-May 1943. DEIR EL MUNASSIB is the next part of the EL ALAMEIN collection, adding to RUWEISAT RIDGE, and pits the men of *Folgore* against the might of Montgomery, late 1942. Both of these modules take the Special Rules to a new level and you'll find some interesting twists in that part of each collection. These and all the BRL 1192 historical efforts can be found at the publishers site at the "Expansions" tab.

BRL 1192 CORE 6

1

BRL 1192 NA British/Italian/ German Infantry OVR

2

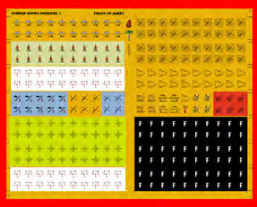


BRL 1192 NA British/Italian AFVs

3

BRL 1192 NA German AFVs

4

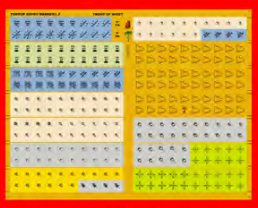


BRL 1192 NA Markers 1

5

BRL 1192 NA Emplacements

6



BRL 1192 NA Markers 2

BRL 1192 EL ALAMEIN

7

BRL 1192 1942-3 AFVs

BRL 1192 NA EARLY AFVs

8

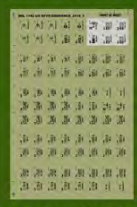
BRL 1192 1940-1 AFVs

BRL 1192 NA USA

9

BRL 1192 NA US Infantry

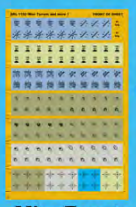
10



BRL 1192 NA US AFVs

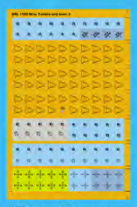
BRL 1192 EXTRAS

11



Misc Turrets and More 1

12



Misc Turrets and More 2

13

Bonus Z

14

DTT Bonus 1

"Born in data—forged in steel—and meant to remain true

BRL 1192

RESOURCE GUIDE 1

www.BRL1192.com

In the early 1970's an innovater and ordnance expert named Harold came along and got his hands on a document unseen outside of military circles: BRL 1192. The data within became the core of the ground-breaking design that preceded every other major tactical-level system and won BOARD WARGAME OF THE YEAR, after its release. Years later, an MIT-grad and devotee named Brian came along and saw the potential of reverse-engineering the 'programmed instruction' rules, and was himself, soon in the company of a publisher named Ray, that owned the original as his first board wargame. The result is something that brings back the approach to tank vs. tank warfare, and keeps the approach true—while working in the enhancements, to create a truly unique system of recreating the war in North Africa and beyond.

In the years since the publication of TOBRUK, a variety of other systems have come to the fore. None use the methodology found in the system founded on and represented in BRL 1192. Some enhancements to game play were introduced in the years that followed the original publication, and were embraced by the designer. These have been judiciously reviewed, and folded in, to BRL1192 to craft a new experience, devoted to but not shackled by outdated notions; yet familiar to hobbyists that enjoyed the work that preceded it all.

Desert Fox Tip

Separate all your marker counters by category in a Plano® or similar container. Then, when you need a marker of a specific type, you can grab it quickly and keep the game moving forward at a brisk pace.

BRL 1192 provides a vast collection of markers, replacing most needs for side-notes and speeding up play.

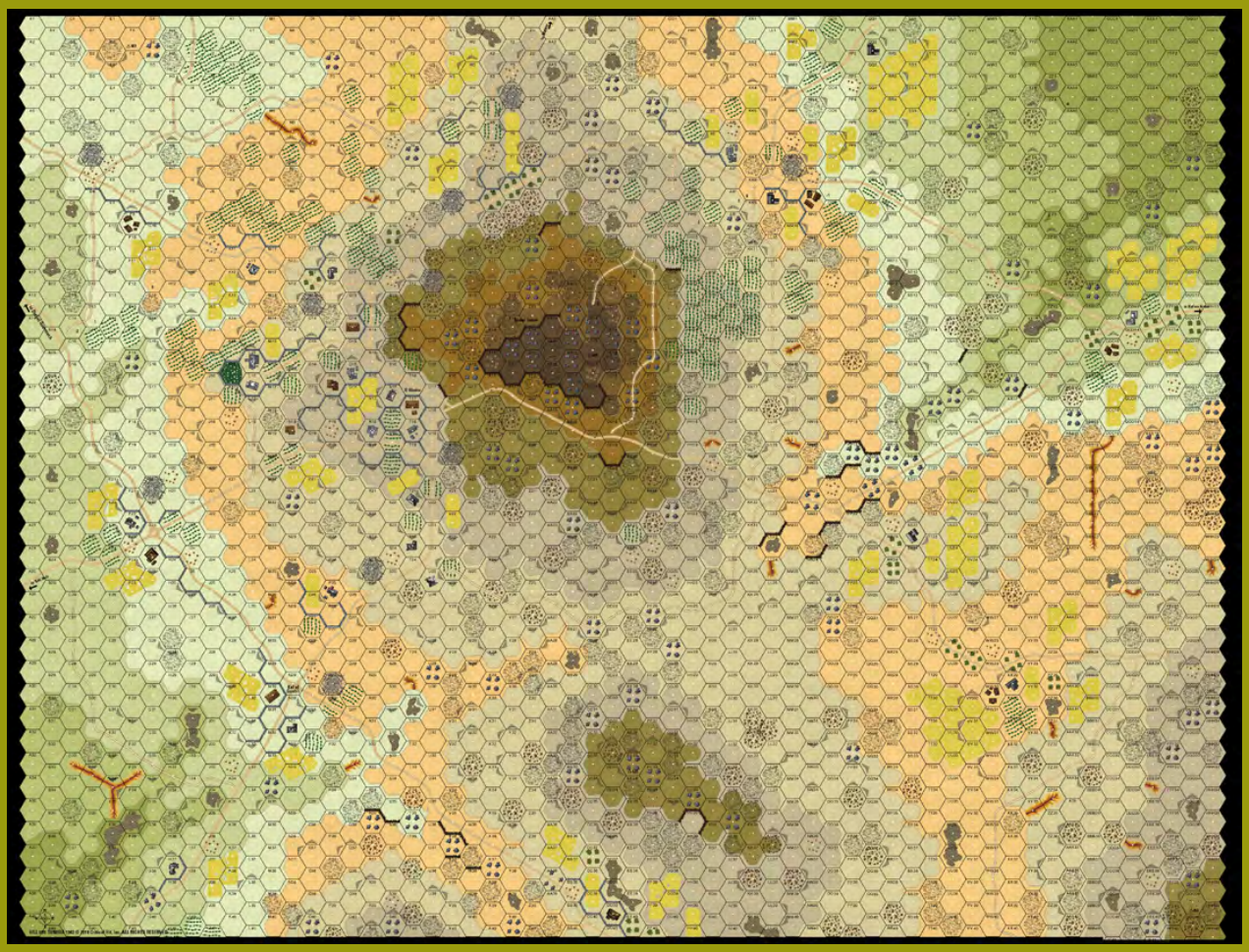
TABLE OF CONTENTS

Scale of BRL 1192: Each personnel counter represents a squad, crew or HQ group of 1-2 officers. Each non-personnel counter represents a single AFV, vehicle, or weapon. Each hex is 75 yards across. Each turn represents and about 30 seconds of real time, depending on how much action transpires.

DTT Scale: The scale of Double Time Tobruk is altered to represent 40 meters per hex and about 60 seconds of real time, depending on how much action transpires.

1

2400+ Counters



HILL 609: THE ROAD TO MATEUR 1943

Hill 609 was an important height in the zone of the U.S. II Corps and German control of the strategic height could not be allowed to stand. The resulting battle would come to be known as “the American Army's coming-of-age” after what had been somewhat of a lackluster performance to that point in this, the first American campaign of the war that pitted Yanks vs. ‘Krauts’.

In a foretelling of what American boys would face at ‘Bloody Omaha’ about a year later, the attack had to be frontal – a suggestion that the hill be bypassed was rejected by General Omar Bradley. Instead, the American 34th Infantry Division, commanded by Major General Charles Ryder, would ‘get after it’, and ‘it’ was nothing less than one of the most difficult objectives in all of Tunisia. The hill was shielded by steep slopes. The Germans had abundant artillery to lay in, and supported fire from nearby heights made the going that much more difficult.

The result was a stiff battle and high casualties on both sides. The young men of the 34th managed to capture Hill 609 on 30 April, after three days of fighting … only to face enemy counter-attacks the following day. It was a near run thing, and a bloody one at that. But just as they would at Omaha Beach, the American fighting man showed his mettle. The German soldier of World War II would have no choice but to fear the Yank adversary in the days and months ahead, after the sacrifices made in American blood at Hill 609.

Hock on Hock

"It is one of the most common of logical fallacies to assume that new material is in error without thoroughly reviewing it, but most people I deal with in the military operations research community realize that such errors can be made and avoid making comments in print without careful deliberation." Hal Hock

Prior to his passing on December 7, 1999 research analyst extraordinaire Harold E. 'Hal' Hock provided his permission to re-print his letters addressing the critics of his TOBRUK game. Here we bring you selections from his archive with the intent of communicating the way Hal went about the task of simulation design and how serious he was about the integrity of his work.

Here we bring Hal's correspondence with his letter to Rodger MacGowan, then editor of "Fire and Movement" magazine.

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2 June 1976

Mr. Rodger B. MacGowan
PO Box 820
La Puente, CA 91747

Dear Rodger:

I have received a copy of your new magazine "Fire and Movement" and am very impressed with its editorial and physical quality. I hope you can maintain these high standards and build the magazine into a long lasting success. However, I'm a little embarrassed in the praise bestowed upon my game TOBRUK in the articles by Mark Saha and A1 Bisasky because I feel that player satisfaction is praise enough. Most of the letters and comments received by Avalon Hill or myself since the game's pre-publication release last year have indicated such a general player response and I'm very happy about it. Mark's and Al's comments add to this feedback that the game is being well received.

In "Fire and Movement" was also presented an article by James G. Steuard entitled "Some Critical Comments on the Firefight Scenarios in 'Tobruk "" which I have read and analyzed very carefully. I'm writing this letter as an informal but precise response to the criticisms of TOBRUK voiced by Mr. Steuard and I hope that you see fit to publish it in the next issue for dissemination throughout your readership and therefore to most members of the wargaming community.

Mr. Steuard states as a fact that there are..."more than a few inaccuracies in the game's vehicular data..."which"...tend to obscure and/or confuse the combat results", and that is is his column's purpose..."to expose some of these errors". In the remainder of the article, however, he neither clearly identifies the alleged inaccuracies and errors nor presents any substantial contradictory data. His criticisms are generalized, unsupported and I believe too strongly stated. I have a natural dislike for terms such as "inaccuracies" and "errors" and my response will be in the form of a detailed presentation of pertinent items of supporting material so that your readers may decide whether inaccuracies and errors exist or not. If Mr. Steuard has further questions or disagreements about TOBRUK or its data, I'll be glad to respond in a similar fashion provided he presents the comments in a reasonable, deliberate manner rather than in the form of generalized criticism.

One of the basic tenets underlying the construction of TOBRUK was that its data sources be as reliable as possible and that the interpretation of this data be done without prejudice. This philosophy was based upon my guess that every single number in the game would probably be scrutinized by people claiming a knowledge of the sources for such data and therefore, naturally skeptical upon seeing it in a game. In the case of direct fire weapons accuracy, the philosophy was critical because nowhere in the entire game system were battle results more crucial. A single serious discrepancy could radically alter the game and could therefore not be tolerated.

What this all boiled down to was that a system was required to calculate direct fire accuracy uniformly from weapon to weapon. Analysis validity was of course needed, but what was most important was that weapons be evaluated in the same way so that their relative value could be shown. This required a generic, but accurate, direct fire weapons methodology be available and before December of 1972, none was.

In that month, however, a 1959 BRL CONFIDENTIAL document entitled "The Effect of System Design Characteristics on First Round Hitting Probabilities of Tank Fire Projectiles" (U), became available for public dissemination due to its eligibility for general declassification. This document did indeed present a complete methodology for calculating the probability of a hit on a tank-sized target as a function of range, and accounted for every possible influence when doing so. These included drift, jump, cant, crosswind, observation of impact, sight-tube parallax, laying error, jump variation, and fire control error, and were evaluated as horizontal or verticle biases occurring constantly or as a function of range for each of three possible fire control systems. Additional parameterization was done in the key areas of projectile shape and type as typified by its ballistic coefficient or measure of "streamlining", round to round dispersion or general uniformity in manufacture, and muzzle velocity. Finally, to be representative of what might occur in combat, the evaluations were simulated under conditions predicted by another document, the Frankford Arsenal Report R-1380A, "Fire Control Studies, Tank Gunnery Evaluation", to be representative of field conditions or "quasi-battle". The overall result was a series of plots showing the probability of hitting a tank-sized area as functions of projectile shape, ballistic coefficient, round-to-round dispersion, muzzle velocity and range. Three of these plots are below, one for each of the three possible fire control systems discussed in the BRL report using ammunition of the properties outlined above the plots.

I have not chosen these examples accidentally. It should have become apparent to readers by now that with such data it would be relatively simple to evaluate or assume the critical parameters of any weapon system, interrogate the appropriate plot in this document and come to a pretty good evaluation of the weapon's accuracy as a function of range. What's more important, however, is that if this were done for all weapons in a given scenario or battle of interest, then the resulting accuracy, or Hit Probability Table entries would be correct with respect to each other and within the error sources imposed by the BRL model, with respect to the real world. I did this for every weapon in TOBRUK.

As an example, let us take the Grant main armament, the 75 mm M2. This weapon during Gazala fired uncapped M72 monoblock projectiles at 1850 ft/sec directed by a relatively simple periscope sight with visual determination of range. These sight characteristics conform to fire control system "A" in the

plots. Being an uncapped projectile without ballistic-cap (or streamlining windshield) an assumption that the h172 round is a "Type 1" in the BRL report terminology is probably okay and inasmuch as this round is included among the sample data presented in the report as having a ballistic coefficient (C2) of 1.13 the C2 curve of 1.0 is undoubtedly close enough. Finally, inasmuch as wartime American ammunition was reputed to be manufactured under relatively high quality control conditions, a low round-to-round dispersion of .30 mils can probably be safely assumed. In addition, one test firing result at Aberdeen in 1941 showed this weapon/projectile combination to display actual dispersions roughly corresponding to .30 mils.

All of this means that the data requirements are filled for use of the leftmost of these three plots for describing the accuracy of the Grant 75 mm M2 weapon at 500 yards (6.1 hexes) range. A quick look at the plot shows that an 1850 ft/sec muzzle velocity produces about .46 or 46% hitting probability against the target. By no coincidence the '6' dice roll 75 mm M2 HPT entry required for a hit at this range in the game reduces to 15 chances out of 36 or 42%. What do you know.

The above example is in no way extraordinary and the same process was repeated many times for each game weapon/projectile combination until enough data points were plotted for complete HPT entries to be made. Where appropriate, heuristic evaluations of the subjective effects of sight quality, boresighting doctrine, etc. were included in these HPT lines. In short, as thorough of an analysis as possible of every influence on weapon accuracy was conducted within constraints imposed by security, data availability, and modeling accuracy. Please note that I don't include the constraint of time, because as I indicated in my comments published in your first issue, T0BRUK is the end result of many years of data collection and wargaming which only by accident resulted in a published game. Having seen my notes and materials Randy Reed understands this very well which is why he so loudly (and I believe harshly) defends the game when under any criticism.

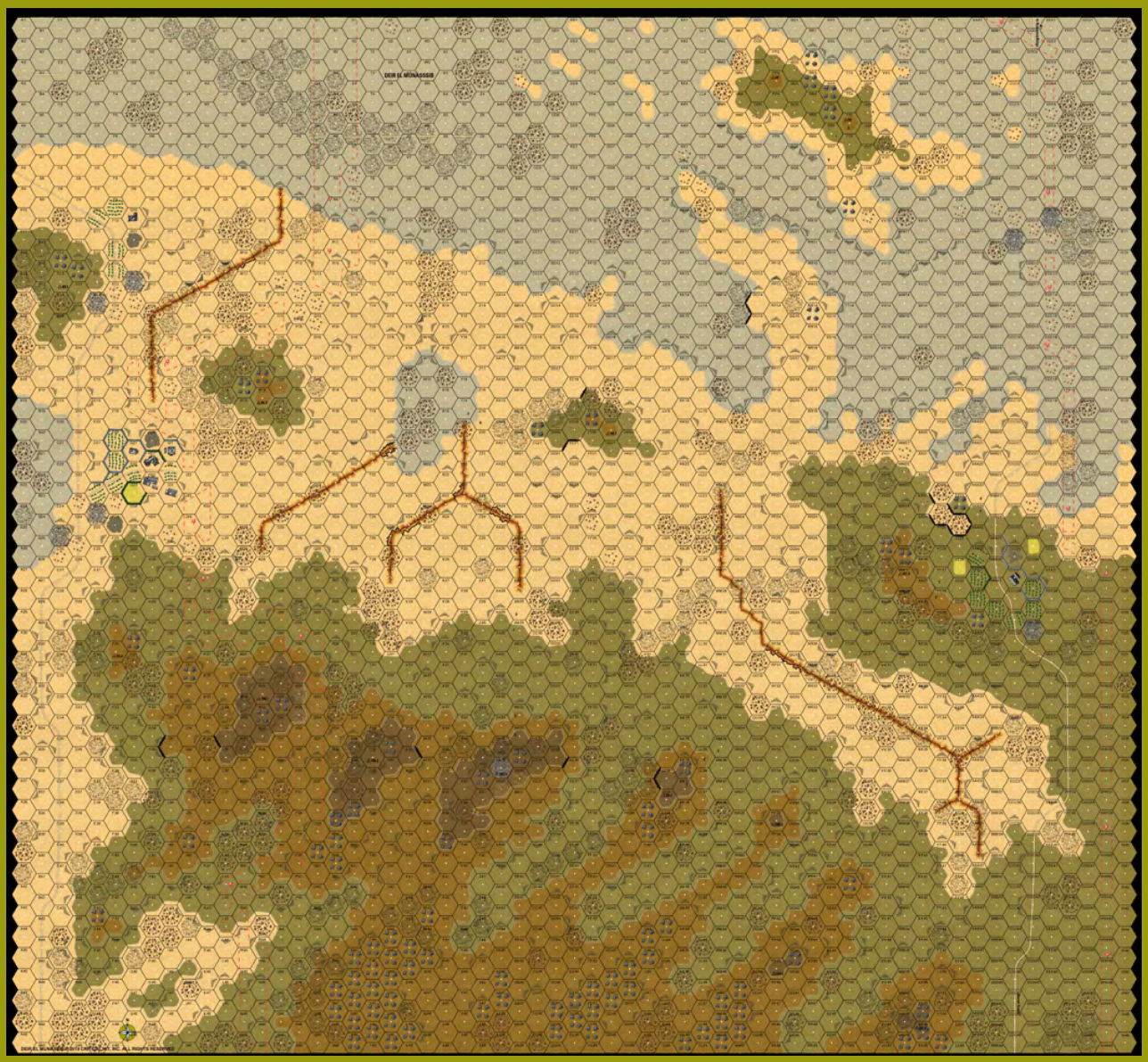
I hope the above discussion thoroughly negates Mr. Steuart's comments to the effect that the 75 mm M2 and 37 mm M6 accuracies were derived from assumptions or questionable extractions from U. S. Army manuals. Four times throughout his critique, Mr. Steuard uses the phase "in reality" or "in truth" to preface a comment on the validity of TOBRUK modeling but supports these statements with not a number of real or truthful data. I know that I've been fortunate to have had the luxury of years of hobby time to research these matters and literally hundreds of references could have been quoted in the Designer's Notes that were not, but if Mr. Steuard or anyone else has information which is anywhere near the accuracy of that presented in TOBRUK, .I'll buy him a cigar.

Turning now to the other comments in his column, I agree that a better treatment of HE vs. tank targets should have been included in the release game. By a sheer coincidence, these rules were delivered to Avalon Hill as part of a game expansion article for the "General" only one week before "Fire and Movement" was mailed and should appear in July or August. I take very strong exception, however, to his discussion of the occurrence of casualties due to concussion from HE detonations on or near tank targets. His implication is that such effects were common in the desert war and absolutely no data exists to my knowledge which supports such an allegation. The major personal narrative accounts of the period, "Take These Men", "Brazen Chariots", "Come to Dust", "The Sands of Valour" and "Alamein to Zem Zem" never once mention such a phenomenon among them, nor do the dozens of general accounts of the desert war with which I am acquainted. Finally, a relatively simple evaluation of blast impulse as a function of range from a 75 mm burst taking into account the one to two orders of magnitude attenuation of overpressure occurring due to shielding by the vehicle shows that nowhere near the required blast would ever be seen by a tank crew for any casualties to occur from even a direct hit by such a small charge provided the armor was not pierced. I won't present the evaluation here due to space limitations but any good explosives reference contains the analytical expressions should any reader, or James Steuard for that matter, wish to perform the calculations himself. Once again, Mr. Steuard's comments appear to be based upon intuition or myth, and hold no analytical water.

His statement to the effect that early encounters between Matilda and M13/40 tanks were few and far between is probably correct (I could only find two cases in the histories) but the entire stated purpose of the TOBRUK firefights was to illustrate "…important weapon characteristics not seen in the regular scenarios..." and Firefight A does exactly this. It shows vividly the weaknesses of the M13/40 in tank-to-tank encounters even when facing a 2 pounder threat and the incredible protection of the Matilda. Neither of these aspects are properly revealed in the normal game scenarios and yet are interesting to see. His comments about the Matildas suffering no real losses in the desert except at Halfaza is absolutely incorrect. I almost constructed a TOBRUK scenario out of one aspect of the Aberdeen (Scenario 6) operation in which 70 Matildas of the 7th Royal Tank Regiment charged DAK positions in the "Cauldron" and suffered over 80% casualties in the process, although earning for their commander, Foote, a Victoria Cross. His statement to the effect that the Matilda was "...far from being a reliable machine." is not borne out by the references; none of the books or pamphlets to which I refer in the game or any of the many other materials describing the tank imply that the Matilda was unreliable at all while several mention in passing that it was reliable but do not elaborate. Mr. Steuard's remark may or may not be correct but his failure to make any reference to even popular literature once again leaves me in doubt.

In the final portion of his column, Mr. Steuard comes out strongly against the game's assessment of the Italian M13/40 tank as being unreliable and combustible when pierced, quoting a search of the game's listed references as producing no statements of unreliability and suggesting that the Damage Table entries for M13/40 penetrations result in too many fires inasmuch as the vehicle was diesel powered. I will respond to the first comment by pointing out that both "Armor in Profile" and West of Alamein, two popular and well-regarded sources referred to in the game, mention the M13/40 as being unreliable with West of Alamein even outlining the reasons underlying this problem. It appears that the main source of failures lay not in the vehicle itself but in the poor standards of maintenance set by Italian units in the field. These low standards caused many breakdowns and forced both the Fiat and Ansaldo factories to constantly "...send their own factory skilled mechanics to the desert to insure proper maintenance." Such descriptions are good enough for me and if Mr. Steuard or his associates have better data I would be surprised.

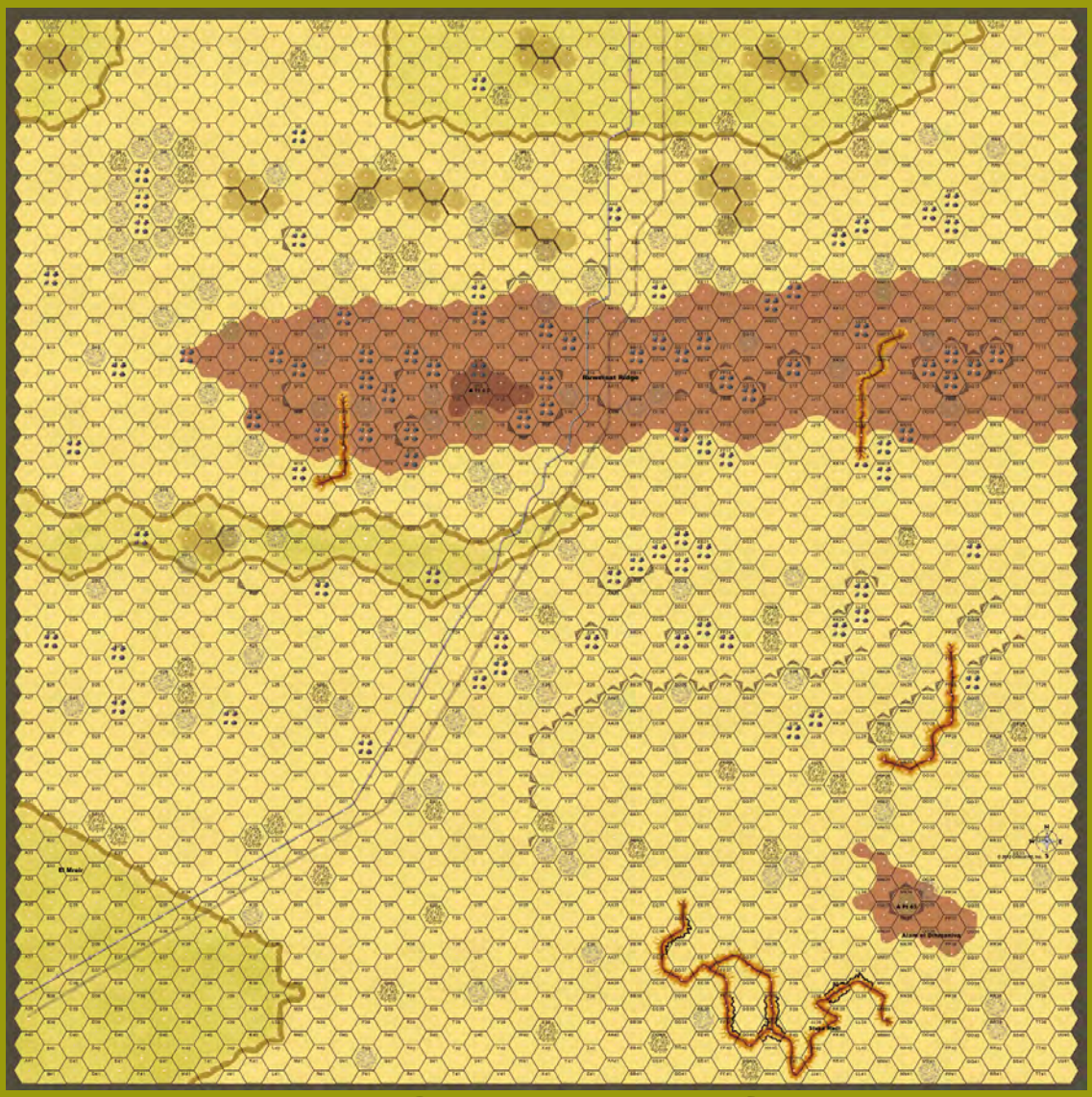
With regard to the inflammability question, I have never seen any definitive data on the M113/40 or any other desert AFV's although many battle accounts exist. When I refer to "definitive" I mean in the sense of vulnerability and lethality assessments as have been extensively conducted on modern AFV's especially since the Yom Kippur war. It appears that such assessments were not done under the strain of wartime conditions and that's not surprising. No, the vulnerability (inflammability) of the M13/40 was an assessment by me as were those for every other vehicle in the game. In doing these assessments I included all possible influences to include the



DEIR EL MUNASSIB: EL ALAMEIN 1942

The push towards Alam Halfa by the *Afrikakorps* put British minefields “January”, and to its west, “February”, within Axis lines. The minefield line “January” ran through a terrain feature known as the “Deir el Munassib:, as well as the “Munassib Depression”. It consisted of steeply sloping sides and carved into the surrounding terrain some fifty feet in places. This part of the southern El Alamein battlefield would become the realm of Italian formations. Most of them with little to no motorized transport to ever escape this hellscape if things went wrong. By the end of September, after a lull that saw a massive build-up at the behest of the new British C-in-C Montgomery, morale was not particularly high among Italian formations. That is, with the exception of one unit, the elite paratroopers of “Folgore”, newly christened as an infantry unit.

Fate, and the Axis high command put them in the path of the first phase of what would soon known to the world as “Operation Lightfoot”. To their east, the British 44th Division came into the line, safely behind the “Nuts” and “May” minefields. It was from here that “Operation Braganza” would emanate forth, a preparatory offensive aimed to force the enemy back from the Deir el Munassib, and allow artillery to be situated there for the upcoming, front-wide, “Operation Lightfoot.”



RUWEISAT RIDGE: EL ALAMEIN 1942

"Rommel is at the gates" went the report that inevitably followed the Desert Fox's great victory at Gazala. Famed war correspondent Alan Moorehead, in Cairo at the time with his wife, summed up the feeling in Cairo succinctly. "When will he arrive?" was the question Moorehead and his friends were asking each other. General Claude Auchinleck did not have the luxury of time to respond to rumors flying around the fleshpots of Egypt. His attention was firmly transfixed on the oncoming enemy. As Rommel's confident German and Italian soldiers streamed forward in tanks and rolling stock of a variety of different nations, the first of many breaks came for the British. The American military attache in Rome tipped off the British that the code messages from Cairo were being read by the enemy. With the codes changed, a valuable source of information for Rommel dried up. To make matters worse, at this crucial time Afrika Korps reconnaissance failed and a sandstorm, combined with difficult terrain, delayed the approach before El Alamein. On the morning of July 1st, reconnaissance reported that South African position at Deir el Shein and the presence of the 18th Indian Brigade at Ruweisat Ridge. That afternoon the attack was launched on the 18th Indians' positions in conjunction with moves against Deir el Shein. The Germans pushed down Ruwesiat Ridge and were nearly through British lines when the 1st Armored Division counter-attacked, halting the German advance. The Afrika Korps succeeded in wiping out the 18th Indian but at a heavy cost: Rommel lost eighteen of his remaining battle-worthy tanks. The actions around Ruweisat Ridge would mark the end of the German threat to Alexandria and the Suez Canal.

diesel fuel in the M13/40. My understanding of these influences was based upon many discussions with U. S. Army Tank and Automotive Command and Ballistic Research Laboratories personnel, and upon massive review of terminal ballistic data not referenced in the game.

Mr. Steuard's remarks to the effect that it is impossible to set a diesel engine tank on fire by piercing it with a solid shot simply indicates to me that he is not well aware of the exact mechanics of tank vulnerability and this is remarkable for the editor of a trade journal on AFV's and your publisher. He should realize, as do I and most other people who have actually studied the problem, that a very high proportion of vehicle fires come, not from fuel sources, but from ignition of stored ammunition or lubricant and fuel spillage build-up under the engine or fighting compartment floors. He should also realize that such ignition need not come from highly incandescent HE sources, but can easily be obtained from a solid shot penetration directly or indirectly. Upon piercing a target, any shot will either shatter (ballistic perforation region IV) or not shatter (ballistic perforation region II) depending upon the impact velocity, armor thickness, quality (Brinell hardness), and slope, and upon the design of the projectile itself. Either shattered or unshattered, the shot body after piercing any significant armor thickness is very hot, as are the fragments of armor plate torn away by the shot's passage given that the plate displays a "disking or flaking" (British WW II terminology) mode of failure. This mass of hot fragments moving into the target produces a very high probability that at least one fragment will intersect ammunition stowage or will wander into an area of spillage or lubricant build-up, and the average temperature of any of these fragments is far beyond that needed to ignite such sources. A K=kill results.

Mr. Steuard seems unaware of the above discussion and of the fact that an M13/40 tank undergoing 2 pounder penetration would be subject to each of the effects described due to the characteristics of its armor, maintenance procedures, ammunition stowage and the characteristics of the 2 pounder shot. I can't believe he is also unaware of the trend in many modern tanks to use shot (AIDS) ammunition as the prime armor-defeating round and of the incredible K-kill lethality of these projectiles against diesel fueled targets in the last two Arab-Israeli wars.

All around, Mr. Steuard's comments in his column appear to me to have been generally "shot from the hip" so to speak. For him or anyone else to have assumed that I as the author, or Randy Reed and Avalon Hill as the publishers, of a game of this incredible level of detail would have dared put it on the market without thoroughly nailing down any potentially questionable data is really hard to believe. It is one of the most common of logical fallacies to assume that new material is in error without thoroughly reviewing it, but most people I deal with in the military operations research community realize that such errors can be made and avoid making comments in print without careful deliberation. I don't wish to be unduly critical of his column, especially when it ended on a note of endorsement for TOBRUK, but I'm afraid it looks like he fell for this common error.

Thanks again for the nice review.

Sincerely,

Harold Hock