A BUNKER'S-EYE VIEW OF COMMAND HQ
by Dan Bunten

[This is Dan's tenth published game since 1978. Among his better-known titles are: Computer Quarterback, M.U.L.E., Seven Cities of Gold and Modem Wars].

DESIGN OVERVIEW

Command HQ is a conquer-the-world game, although not a wargame. It has more in common with the boardgame Risk! than with the wargames often highlighted here in Computer Gaming World. (Actually its closest ancestor from board games would be Axis and Allies, the Milton Bradley WWII game with lots of toy soldiers, ships and planes inside). The working title of CHQ was War Room. Thus, CHQ simulates the command options at the highest level where deploying armies, fleets and air wings is the detailed level. Player interactions in CHQ primarily focus on buying and transferring units, with movement and combat taking place automatically.

Appropriate to such a simulation, there is limited intelligence concerning the enemy. Only enemy units within a "scanning range" of your units are "seen." (Depending on the war being simulated, planes and satellites may add to your reconnaissance ability.) Also, as in the real world, CHQ has no "turns." The game runs instead on "modified real-time." When there is little action, time passes quickly and, when the battles heat up, the speed conveniently slows. In addition, players can adjust the overall speed of the game to suit their style-from strategically slow to almost arcade-like fast. CHQ offers a modem/serial option for the 2-player game. Thus, even when playing against another human the "limited intelligence" and "real-time action" features are still maintained.

In the design of CHQ, I tried to make the interaction of the world and units intuitive. For instance, tanks are better on the attack, infantry are better on defense, jungles slow movement more than forest or mountains do, mountains and cities are easier to defend, and deserts and polar regions cause higher attrition. These kinds of "obvious" interactions make CHQ playable without the need to know the specific numbers the games uses in its programming. Thus, for this reason, and in keeping with the normal way MICROPROSE writes game manuals, we left out the raw values that create the "model." However, since Computer Gaming World readers have an appetite for such figures and the sophistication to handle them, here are some numeric details on the CHQ model.

GETTING THERE FROM HERE

The CHQ world map/game "board" is based on a Mercator projection
map with a resolution of 320 squares by 136 squares covering the
latitudes from approximately 75 degrees north to 55 degrees south.
The world "wraps" around horizontally. Terrain affects the game by
modifying movement and combat, and by causing attrition.
It is important to visualize that units technically take up only
one square, while their icons occupy a three- by three-square grid
(the same size as cities and bases).   Some actual values used for
each of these factors are shown in tables 1 and 2.

TABLE 1: MOVEMENT STEPS AVAILABLE PER ROUND BY UNIT TYPE

Infantry	12	Submarine	40
Armor	24	Cruiser	40
Transport	36	Carrier	40

NOTE: Units automatically "save" left-over steps as
they are moving (see the terrain costs on Table 2,
below). Land units move only once per round, while
sea units may move as many times as their
accumulated steps will allow when they are outside
the range of enemy units (usually twice per round).

TABLE 2: OTHER TERRAIN EFFECTS

Terrain	Move	Attrit.	Dig In	Repair
Ocean	200	0	n/a	n/a
Dock	20	20*	yes	L/S
Lake	20	3	n/a	n/a
Capital	20	20*	yes	L
Base	20	20*	yes	L
City	20	20*	yes	L
Resource	20	0	yes	L
Plain	20	0	yes	n/a
Forest	30	0	yes	n/a
Mountain	40	0	yes	n/a
Desert	20	3	yes	n/a
Jungle	60	3	yes	n/a
Polar	50	5	no	n/a
Wasteland	50	31	no	n/a

MOVE = The number of movement "steps" used by a unit to leave each type of terrain.

ATTRIT. = Attrition causes a unit to suffer damage in certain terrains. "Resistance" attrition (marked with an *) is similar to an attack by an enemy unit (i.e., it can destroy the moving unit). In neutral sites, the factor is 20 points of damage. For enemy-held sites the factor in only 2 points of damage. "Basic" attrition (i.e., "environmental" attrition) happens regardless of ownership, but unlike resistance attrition cannot lower a unit's strength below 20 strength points.

DIG IN = Those lines marked with a "yes" mean that infantry units can dig in (entrench) in that terrain type if they are not moving or engaged in combat.
        REPAIR = Ships can repair where an "S" appears, and land where an "L" is indicated. The facility must be friendly and the repairing units cannot be moving or engaged in combat for repairs to occur. All units repair at the rate of 10 strength points every other round up to their maximum of 100 strength points.

During combat, units lose movement steps for the amount of damage they suffer and inflict (representing time engaged in combat). For infantry units, this loss is equal to their total damage suffered/inflicted, and for armor the loss is half the damage impact. This effect can reduce the steps to a deficit of up to -25 (when these steps are negative, that is when the unit becomes "pinned").

When not moving, a land unit's accumulation of steps is reset to zero while a ship's value returns to its basic steps-available-per-round (thus ships are quick to make an initial move while land units wait to build up movement steps).

The way to get units "unpinned" is with the "new orders bonus" built into the game. This means that if an already moving unit is given a command to move and its step accumulator is less than 150% of its per-round rating, that accumulator is increased by a 50% bonus (the old "keep kicking them in the butt" approach to leadership).

GLOBAL WARFARE AS SCISSORS, ROCK, PAPER

There are 6 basic unit types that occupy space and interact in the
world. Although CHQ is a very high-level strategic simulation,
these unit types have very distinct features. There are two kinds
of land units: infantry and tanks. Tanks move twice as fast as
infantry, cost twice as much and are better at conducting a land
offensive. Infantry "digs in" when not moving or engaged in combat
and, once entrenched, is less vulnerable to land and sea attacks.
Also, infantry is the unit type of choice to "hit the beaches" in
an invasion (see Table 4).

  TABLE 4: DAMAGE POINTS INFLICTED BY ATTACKER ON DEFENDER

Defender			Dug-in				
Attacker	Inf	Arm	Inf	Trans	Sub	Cruis	Carrier
Infantry	20	17	15	25	35	35	35
Armor	26	20	20	25	35	35	35
Infantry Transport	18	16	14	10	5	5	5
Armor Transport	9	8	7	10	5	5	5
Submarine	0	0	0	100	25	34	34
Cruiser	12	10	6	50	34	25	34
Carrier	10	8	5	50	25	20	25
Airplanes	50%	50%	50%	34	34	25	25

        Note that airplanes do a percentage of damage to a land unit's
   remaining strength, and a fixed amount of damage to units
   (including land units/transports) which are at sea.

When land units are moved to sea they instantly and automatically
become "transports" and move like ships. Ship types include these
transports, submarines, cruisers and carriers. Transports can be
easily killed by any other ship but are the only ships that can
mount amphibious attacks against land units, cities and bases.
Subs are hard to spot and do major damage at close range. Cruisers
have a moderate range. Cruisers can also bombard shore units, are
good against carriers in head-to-head combat and are better than
carriers against subs. Carriers are twice as expensive as subs and
cruisers, have a wider range than cruisers (although they do a
little less damage) and they can carry an airplane unit. These
airplane units have a very large range, can do major damage to
other units, can bomb cities or oilfields, can transfer or airdrop
infantry, and can also dogfight other planes.

THE WORLD AT WAR

There are 5 scenarios in CHQ, covering real as well as imaginary World Wars. Some brief annotations follow.

1918 (WWI): This scenario has only cruisers, subs and infantry. There are only a few cities compared to the other scenarios, but they generate income for buying units. The side who owns London, Paris and Berlin wins.

1942 (WWII): Infantry, armor, subs, cruisers, carriers and planes are available during this era. Income is generated by cities but no oil is used. The side who owns Washington, London, Berlin, Moscow and Tokyo (i.e., all the capitals) wins.

1986 (WWIII): This selection postulates a war between NATO and the Warsaw Pact. It includes all the units of 1942 unit types plus recon satellites, killer satellites (for killing recon satellites), nukes, foreign aid (with which to "buy" allies) and intel scans (to "spy" on the enemy during the "Cold War" or cease-fire periods). Custom layouts of forces can also be created for this war and saved to disk (which adds considerably to the value of intel scans). The game starts in "Cold War" mode with a timer that indicates how long the players must make chess-like purchase and maneuvering decisions before hostilities may begin. Cease-fires may also be declared if both sides agree, leading to another couple of minutes of cold war. To win, one side must own Washington, London, Moscow and Tokyo (note that all these capitals are protected by ABM systems so they can't be nuked). For this scenario (and the following ones), oil fields supply the energy needed for cities to create income and for units to move.

2023 (WWIV): This scenario has the same features as "1986" except the capitals are moved to random cities and the alliances are scrambled (at least as viewed from the world of today - but who knows about the world of tomorrow?). Each player starts with 600 billion dollars, very few cities and resources, no units and 5 minutes of intense cold war maneuvering before fighting can begin.

????(WWV): Battling it out under these parameters postulates an "after the holocaust" war of growing empires led by the player's "city-states." All cities, bases and oil fields are in random locations across the globe and the opposing capital is hidden. The units included are the same as in 1942 but, unlike that scenario, oil is needed to generate city income and move units. To win, one must find and capture the opposing capital. Many people have

compared this scenario to the situation presented in the INTERSTEL
game Empire.

THE RIGHT TOOLS FOR THE JOB

Units must "see" the enemy unit before they can fire at it. Thus,
units have a scanning range and a firing range (see Table 3). In
general, a unit scans for enemy units each round and spots all
units within its scanning range (except for submarines, which have
special rules as noted below).

TABLE 3: UNITS AND THEIR RANGES

	Firing Range			Scan
	Land	Trans.	Ships	Range
Land Units	2	2	1	5
Transports	2	2	1	3
Submarines	n/a	2	2	4*
Cruisers	3	3	3	5*
Carriers	4	4	4	6*
Airplanes	15**	15**	15**	15***
Recon Sat.	n/a	n/a	n/a	20

NOTES:

* = Submarine scan range is reduced to 3 if the target is not
moving. A sub can only be spotted at a range of 1 when it is
either stationary or if the scanning unit is moving
(regardless of spotting unit's normal range).

** = Airplanes don't automatically fire. Instead, they wait
to receive missions.

*** = Airplane range also depends on the scenario chosen: 15
for 1986 and 2023, and 10 for 1942 and ????.

A visual aid for ranges: 1 square range must be envisioned as
"deep overlapping," 2 squares as "slightly overlapping," 3
squares as "touching," and 6 squares as "a full unit away."

If there is an enemy unit within firing range, the unit then
selects the nearest target, turns towards it and shoots. (Facings
are limited to north, south, east or west with diagonal unit
contact going either east or west, as appropriate). After firing,
units spend a round preparing to fire again (i.e., units fire every

other round). (Important note: a "round" is defined as the time it
takes for every unit in the game to have a chance to move, scan,
etc.)

Stationary units that aren't engaged in combat are ready to fire
when a target approaches them. Moving units have a 50% chance of
being ready to fire the first shot, thereafter firing normally
every other round. If there are multiple targets at an equal
distance, the computer picks randomly between them if it is the
unit's first shot, and then stays engaged with that chosen enemy
unit until it is either destroyed or another enemy unit gets
closer.   In CHQ, shots cause damage which reduce the unit's
strength from its potential full-strength value of 100 strength
points. When the strength is reduced to zero or less, the unit is
destroyed. The amount of damage done by a particular attack
depends on the attacking and defending unit types (see Table 4),
the defender's terrain (see Table 5) and whatever additional combat
rules might apply in a given situation.

TABLE 5: REDUCTION OF DAMAGE MODIFIER FOR DEFENDER'S TERRAIN
          TYPE

Terrain	Defender	Reduction
City*	Infantry	1/3
City*	Tanks	1/5
Mountain	Infantry	1/4
Mountain	Tanks	1/6

NOTES: * = Includes cities, bases and capitals.

Flanking applies when there is combat between units
on land. Land units hit from the side get 1.5
times the normal damage done to them while those
shot from behind get double the normal amount.
Another condition of this rule is that only units
which are currently engaged with an enemy unit can
be flanked. Thus, in a battle two individual enemy
units, neither side can get a flanking bonus.

Another combat rule is called "bombardment" and applies when
cruisers or carriers are attacking land units from greater than one
space distant. Losses from bombardment will cease, however, if the
targeted land unit's strength is below 30. (If the ship closes in
adjacent to the land unit it may reduce it to below 30 strength
points, but the ship will be vulnerable to deadly return fire by
the defender's shore batteries at that close a range; see Table 4).

AIRPLANE FAST FACTS

Scan and Mission/Transfer Range by Scenario
1942, ????   10/70
1986, 2023   15/100

"Downtime" Schedule
After a mission   8 turns
After defense (within 9 spaces)   +4 turns
After aborted mission due to "no fuel"   2 turns

Other Facts
Attrition rate to airdropped infantry =   20%
Attrition rate to bombed land unit =   50%
Damage points inflicted on cruisers
  and carriers =   25
Damage points inflicted on transports
  and subs =   34
Damage to city when bombed = 250 million
  + 5 turns delay
Damage to oil when bombed = 1000 units
  (5 turns production)

EXAMPLE OF COMBAT "BY THE NUMBERS:"

An entrenched infantry unit is defending a city from an
attacking infantry unit (which happens to be located in an
adjacent mountain), and a tank attacking as a transport
(although hitting the defending unit in the flank, the
transport, being a sea unit with a blue background, receives
no flanking bonus). Here's how the losses would be calculated
for each unit during a round in which it fires:

The attacking infantry unit's damage to the defender =
15 points (Table 4) x 2/3 (Table 5) or 10 points of damage.

The attacking tank's damage to the defender =
7 points (Table 4) x 2/3 (Table 5) or 4 points of damage.

The defending unit's damage to the attacking infantry unit =
20 points (Table 4) x 3/4 (Table 5) or 15 points.

Net results: The defending infantry unit takes 14 (10+4) points of damage, the attacking infantry unit takes 15 points of damage, and the attacking tank is unscathed. (Important lesson: don't invade from the sea with tanks).

SUBMARINE SURPRISES

Submarines have a number of special rules. First of all, they can't be spotted by satellites or airplanes. If a sub is not moving or the scanning ship is, the sub can only be spotted from an adjacent square. If the scanning ship is stationary, then it can spot moving subs up to 3 squares away. Once a sub is spotted it will remain "seen" at the normal range of the scanning ships (e.g., 6 for carriers and 5 for cruisers). Subs can spot moving ships at a range of 4 and stationary ships at a range of 3. Thus, stationary subs are almost invisible unit they attack. However, once they attack they are immediately spotted.

Airplanes are another unit type with special rules. Like other units, they automatically scan when "available" and their range of 15 rivals satellites (whose range is 20). Unlike other units, however, they don't automatically attack. You have to designate a mission for them. The range for strike missions, infantry paratroop drops, infantry transfers and bombing runs is 15. For plane transfers to friendly cities or carriers the range is 100. (For scenarios other than 1986 & 2023, these two ranges are reduced to 10 and 70, respectively).

DEATH FROM ABOVE

Infantry units which air drop automatically lose 20% of their current strength. Air drops may not be made onto cities or water. Air attacks on enemy land units take 50% of the land unit's remaining strength (planes can kill land unit's but it takes at least 6 attacks, so the point of diminishing returns quickly becomes apparent). Against cruisers and carriers, planes reduce the defender by a fixed 25 points of damage, and against subs and transports that number is increased to 34 points.

Bombing cities reduces the enemy money by 250 million and adds 5 rounds to the time before that site can be used to produce a new unit. Bombing oil fields takes 1000 units of oil. (In other words, bombing either target will cause it to lose five rounds worth of value). After a mission, an attacking plane is unavailable for 8 rounds. Any planes that were used for defense

(this happens automatically if the attack was within 9 spaces of a defending airplane) will be unavailable for 4 (additional) rounds. During its unavailable time, a plane cannot scan for enemy units (thus "seen" units may disappear). Note that airplane ranges are calculated as a radius in a circle from the square they are located on, not as a large square "box." The radius lines shown on the map are correct.

FIGHTER CHANCES

Planes do not always complete their attack missions (transfers with or without infantry never fail). Success depends on the nearness of enemy planes to the target and whether the nearest enemy plane is available or not. From 10% to 75% of missions fail (depending on the distance from the enemy plane and its availability). If the target is on top of or next to an enemy plane a dogfight ensues. If the enemy plane is unavailable there is a 25% chance of completing the mission, 40% chance the mission fails, 10% the friendly is shot down and 25% the enemy plane is shot down. If the enemy plane is available, there is a 50% chance the attacking mission will fail, 25% the attacker will be shot down and 25% the defender will be shot down. All of this can be seen on table 6, below.

   TABLE 6: DOGFIGHT TABLE

Enemy Plane is:	Available	Unavailable
Mission Completed	00%	25%
Mission Completed/ Enemy Air Destroyed	25%	25%
Mission Fails	50%	40%
Mission Fails/ Friendly Air Destroyed	25%	10%

   (Defending plane is 0-1 space away from target)

If target is 2 or more spaces from a defending enemy plane the probability of failure ranges from 10% to 50% for land targets (and from 20% to 60% for ship targets), depending on the distance from defending planes. At a distance of 9 spaces or greater from a defending airplane, no defending airplane is engaged but the mission still has a minimal chance of failure (10% for land, 20% for sea).

Once these "non-dogfight" missions are determined failures, 66% of the failures result in a "failed mission" where the mission is

aborted without loss or damage, and the other 34% results in a plane being shot down. If a defender is engaged (i.e., the battle is within 9 spaces of a defending airplane), half the time it will be the one lost. If there is no defender, then the mission plane is always lost.

Example one: an airstrike is launched against an enemy ship at sea which has no air cover. There is an 80% chance for success, a 14% chance for an aborted mission, and a 6% chance the attacking plane will be destroyed.

Example two: an airstrike is launched against the same enemy ship, only this time there is air cover for it at fairly close (3 spaces) range (not close enough to dogfight). Now the probabilities are a 40% chance for success, a 40% chance for an aborted mission, a 10% chance to destroy the defending airplane, and a 10% chance to destroy the attacking airplane.

Example three: The same attack, only this time the defending air unit is at extreme (8 spaces) air cover range. Now the probabilities are a 70% chance for success, 20% chance for an aborted mission, a 5% chance to destroy the defending airplane, and a 5% chance to destroy the attacking airplane.

Note that in each of the last two examples, when the attacking plane is destroyed, the mission fails, and when the defending plane is destroyed, the mission succeeds.

OIL'S WELL THAT ENDS WELL

As mentioned previously, a successful airstrike against an enemy oil resource will cost him 1000 units of oil. The question is, how far does a unit of oil go? Table 7, below, should answer some of these questions. Know that each oil resource produces 200 units of oil per round, and that one's reserve can hold a maximum of 10,000 units.

TABLE 7: OIL CONSUMPTION RATES

Capitals	200 per round	Airplanes	20 per round
Each City	50 per round	All Moving units	5 to initiate movement
Each Base	None	Moving Land Units	1 per movement step
Each Unit	2 per round*		

* = This cost is spent for maintenance "just to exist."

Some of the information on this table contradicts what the
documentation might imply, but be aware that these are the
actual numbers that the program uses!

OF NUKES, SATELLITES AND FOREIGN AID

These are special purchase options available in the 1986 and 2023
scenarios only. Nukes have some serious consequences in the game.
Besides leaving a nasty wasteland in which no unit can survive
(although oceans are unaffected), alliances shift and even once-
friendly units can turn hostile. Eventually, if enough nukes are
used, a nuclear winter will ensue and the game will be aborted.
The probability of nuclear winter starts at 50% for the 10th nuke
and increases to 100% at the 20th. There is no such thing as
"safely nuking," with the consequences in lost allies and units
switching sides going up significantly as each of the following
cases is true:

  -     this is the first nuke used in the war,
  -     a city was destroyed
  -     the destroyed city was at one time the player's ally
  -     no enemy units were killed.

The actual probability is difficult to calculate because the
program is very iterative at this level but, suffice it to say,
don't drop the first nuke of the game on a friendly city unless you
want to fight without friends! Only your home country and units
stationed there are free from the "political fallout."

Recon satellites offer a good way to spot enemy forces. They have
a scanning range of 20, which is the best in the game. They can
also be moved, but use up their fuel and might fall from orbit if
overly maneuvered. They move 8 "world" (as opposed to "satellite
map") spaces towards their destination per round. Killer satellites
move twice as fast and, when they hit their destination, they
destroy all satellites within 8 "world" spaces. Satellites are
launched with 255 units of fuel, which are consumed at the rate of
2 per "world" square moved. Thus, they can make slightly over one
trip around the globe before crashing. They expend no fuel to
remain in place.

Foreign aid is the way to gain voluntary allies (unlike conquest).
If a country is neutral, giving as much aid as there are cities in
that country will sway them to your side. In some cases, a country

may look neutral but is tending towards one side or the other. Mexico in 1986 is tending towards NATO, so the Warsaw player must invest twice to seduce such a country. Conquering a city in a country makes that country tend away from the invader. If a large neutral country like the U.S.A. in 2023 is attacked by one side, the other side should only need spend a single aid to make the country an ally. However, armies can block aid. Land units within 4 spaces of a city during cold war or 10 spaces during active war block enemy foreign aid and its adverse effects.

BUGS AND PIRACY

As far as I know there are no major bugs in the released version of the game. There has been some confusion about video modes supported by the product. CHQ requires an EGA, VGA or Tandy to work. However, there is a pre-release version of the game that has been pirated, and that version has some serious flaws. I suppose that ranting about how piracy deprives me and my partner of a return on our 3 man-years of work will only convince those mature enough and ethical enough to have already decided not to pirate software. (Contrary to popular opinion we are not getting rich off our royalties.) However, the player may not know that pirating software hurts him, too. The industry responds to sales figures and if a particular program gets widely pirated with the consequence of poor sales, the publisher will assume it was not a good type of product to make more of. Thus, less or, at least, no more of that type of game will show up on the market in the future. I have personally witnessed a case of this with my game M.U.L.E. back in 1984 (the heyday of Atari and the C-64). M.U.L.E. sold about 30,000 copies (not good sales) but was very widely distributed by pirates. The result was that publishers believe there is no market for 4-player strategy games. If you get a pirated game, try it out and see if you like it. If you do then vote with your wallet. (In the case of CHQ, if you get a pirated copy and like it, buy one to avoid the bugs!) I'd love to hear from you about what you liked or didn't like in CHQ, suggestions for further products or even challenges to play a modem game. (I appreciate all mail even though I'm awful about answering it). Contact me at: Dan Bunten, Ozark Softscape, P.O. Box 1845, Little Rock, AR 72203.