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1. Introduction

1.1 How to start playing quickly

This manual is organized as a set of modules. Each module explains a single task or topic. If read (or at least skimmed) sequentially, it will guide you quickly through most of the learning curve.

First, a sample game...

This manual is designed to be both a tutorial and a reference guide. To start playing quickly, do the following:

Read sections 2.1,2.2,2.3 and 2.4. These sections will teach you how to install and boot the program on your particular machine, how to enter the password and to start a new game.

Proceed to section 3.1. This is a three part module which guides you through a sample game. After playing through a few turns, you should be familiar the most important concepts.

Second, read sequentially through the manual...

Continue with sections 3.2 What are areas? You'll learn how the map works, what the different pieces are, and the object of the game.

Then start a new game and read through section 4. Playing the game. This section contains modules corresponding to each of the game-turn phases. Follow along with the manual as you play through the different phases.

When you've completed the first turn, read through section 5. Using the map display. This section explains how to use the advanced map features, and how to interpret the attack resolution screen and the victory point graphs.

Finally, after completing a game, read Section 6. Notes on basic game strategy. This section will give you some good ideas on strategy and tactics.

Third, try out all the options...

Worlds at war has many options and it will take you many games to try all the combinations. The three most important options are:

- Will you use the space map or the naval map?

- Will you play with hidden movement?
- How large a map will you use?

The easiest combination is: naval map/no hidden movement

The most challenging combination is: space map/ hidden movement

In all cases, a larger map will give you a longer and more challenging game.

Finally, return your user response card and comments...

We really listen to your feedback. If there's something you don't like about the game, or if you have an idea on how to improve it—tell us! We may not agree, but if we do, we'll be glad to send you an updated version of the game.

This manual is designed to be maintainable. If you find a 'bug' in the manual, feel that an game feature is poorly described, or think that additional modules are required to explain a task or concept—please let us know! We'll fix the manual and send you the updated module(s).

Enjoy!

1. Introduction

1.2. What is 'Worlds at War' about?

'Worlds at War' is a model of naval combat. As such, the game captures the essential principals of naval warfare.

The topic...

Admiral King studied the chart spread out on the light table. It diagrammed the area of space in the Eastern District Twenty powerful independent star systems were scattered like jewels across the vastness. Before the war the Admiral had been to them all First as a young lieutenant (j.g.) on liberty and finally as a diplomat. But it was too late for persuasion now.

These neutral star systems were placed directly across a vital line of communication. If the Imperial navy were permitted to establish bases on just a few of these key planets then Earth's major ally in the spiral arm would be cut off. This King could not allow—would not allow!

Now King and Admiral Xeni, King's counterpart were poised at opposite ends of this strategic star chain. Each commanded a great armada: Hypercarriers crowded with delta configuration bombers and missiles; battlecruisers bristling with guns; and Marines, hundreds of divisions. More men than had fought in all of Earth's legendary land battles combined. Enough to conquer a dozen planets—not enough in other words to do the job at hand.

.. .Above, in near orbit, floated the enormous dry docks of King's base planet. Like silver on velvet the three majestic platforms held the vast hypercarriers and battlecruisers in their gravity fields. Production was going on 10 hours a day, 10 days a week. Non-stop the arc flares shot into space. Incessantly the silent throb of machinery vibrated.

Mobile scout bases had been sent out weeks ago. Just yesterday TF-17, a Carrier Battle Group had left space-shore to rendezvous with a large Marine Convoy in far orbit. Live Videocasts went on all day Synthbands played and documentaries on famous battles were shown. The message was getting through—we were at war.

"Countdown commencing at 10..." Captain Fordham looked down at his chrono, then out of the viewing window. The stars were already melting together and he knew it was time to strap in.

"7... " The low rumble in his stomach grew.

"3..." Fordham looked across to his navigator who was in deep concentration.

"Good luck!" he thought knowing the words would have no effect on the operations of the hyperspace unit or the navigator. These were the worst moments of any flight, fists always tightened sweat glistened.. .every tune.

"Zero. Unit engaged", shouted the navigator against the now loud silence. The stars converged then swirled into nothing. Stillness. A slight loss of gravity then an unwinding of the new star system.

"Made it!" said Fordham to himself, then aloud: "Well done! We're through. Any variances, navigator?"

"No variances this time. Captain. Luck with us again, eh?"

"No such thing as luck, son. You need old fashioned skill to jump through hyperspace paths. And a good navigator." He added. "On the way back it may be different. I have a feeling that path might just close up altogether." He watched as the navigator unconsciously shrugged. Shifting hyperspace paths were an unavoidable and every day threat to space jumpers.

Behind him the Battlegroup glistened in the starlight The advance scouts were reporting in: All was quiet, for now.

The missile barrage had just hit. Explosions lit up the deep brown planet's night side. The face of the planet shimmered through shock waves, making it all seem like an illusion.

"MLCs ready, sir!", the voice shouted, seemingly from 10 millis away.

"Alright, commence the attack." The general looked down at the planet. Smoke was already obscuring the bright lights of the night side. Soon it would be dawn. He heard bis own voice saying a prayer.

"M2 reporting"
"M3 reporting."
"M4 reporting..."
The comm beam, occasionally cut, toned the status *of* the descending Marine Landing Craft, or

"M14 reporting..."
The last ships were still reporting as the first hit zero.

"By the numbers, shout off. Sched 7 in operation. Go to it Maurauders!"
Lew, his armour weighing him down, leapt first The sucking mud immediately pulled him down.
"Retros men!" he shouted to his men. Then "Retros!" into his own helmet, which switched on the voice activated grav-lifter. His booted feet pulled out of the mud as the men followed him out of the MLC and spread out over the now seemingly solid mud.
"You know our targets I Lets go!"
The squad began to move fast, now skimming over the soggy surface. They came quickly to their primary target—a barracks standing on thirty mil stilts high above the ground. The barracks were connected by a tunnel to an equally important industrial installation: A good target
"Target set: building." He looked up at the red glow projected in his heads-up display. "20 mill, two seven oh, cend."
A voice in his helmet said, "Cend launched, Lew."
He flew past the building, looking for another target Lew figured the squads secondary target had probably been hit by now, a victim of the brutally efficient Alpha squad. If so, then his remaining job was simple: to create chaos and confusion in the enemy ranks; to demoralize the enemy; to break him, and finally to destroy him. Personally, clad in his double plated armor, gas, heat and poison proof, Lew felt relatively safe.
"Target destroyed, Lew", the voice said, without emotion. Then the shock wave hit him. The gyros kept him upright. Just Turning, the lieutenant saw a huge fireball rising into the pink sky.
"An ammo dump!", he thought.
The next three hours saw death, destruction, consolidation. The next three days saw consolidation, defence and finally, policing.

Li the new HQ, the lieutenant saw the stats: 1289 dead. 5007 wounded. 451 missing. 3253 back safe and sound. One troop stats. 10 troops to a cavron. 10 cavron to a division...
"50 divisions attacked today" he said to himself. "I hope they fared better."

Back on Base Planet, production was building. Admiral King sat in the control seat and looked at the screen built into the arm of the chair. The graph showed large losses in men but gains in territory. The "Victory Graph", the engineers called it
Admiral King wondered, but hoped. She stood up and said to the man beside her.
"Take over, will you? I need to rest..."

The game...

'Worlds at War' is a game of real strategy for one or two players. It's a game of naval and amphibious combat, on a galactic scale. Simple in concept, 'Worlds at War' can be played in an hour, as a small, tactical study with the flavor of a chess game; or for a weekend, as a campaign game with vast regions of territory to explore, huge fleets to maneuver, and neutral planets to conquer.

Pieces represent base planets, neutral planets, task forces of different types, bomber formations, missile barrages, scouts and marine landing craft You'll start the game with a certain number of production points and build a fleet based on the strategic requirements of the randomly generated map. A small trickle of supplies will reach your base planet each turn, but the game is primarily one of tactical combat, not production.

2.4 Starting a new or saved game

When you first boot the program, you are asked to type in the name of a game. If the name is that of a previously saved game then that game is restored. If it's a new game, then a new game will be started. In addition, you can start a new or saved game at any point during the game though the function keys.

How to enter a valid game name

The following operations require you to enter a valid game name. A valid game name contains only the characters A-Z and 0-9. It must begin with a letter and can be up to 8 characters long. It should not contain any punctuation or blanks. Some valid names are:

GAME1 MYGAME FRED3 XYZ123

Simply type the name into the lower text window. You can correct any mistakes with the backspace key. When ready, press the <Enter> key.

Exhibit 2.4.1 The new-game prompt

Every game has to be named, enter a name now:
FRED3

Entering a game name after booting

After you enter the password, you will be asked to enter the name of a game. Exhibit 2.4.1 shows the text windows during this operation. At this point, you have two choices: 1. You can enter a new name — one that has not been used before, or one that you've erased from your game disk. In this case a new game will be started. You will be presented with the configuration screen, and after you complete it, a new game will begin. 2. You can enter the name of a previously saved game — one that you entered as a new game at a previous session. In this case, the game will load the saved game data and begin the game where you left off.

Starting or restarting a game with the function keys

During a game, you can start a new game, or restart a previously saved game by using the function keys. To view the function key key menu, press the F1 function key. Exhibit 2.4.2 shows the text windows after pressing F1.

Exhibit 2.42 Function key menu

Functions: F2	F3	F4	F5	F7	F8	F9
Command:New	**Open**	**Save**	**Quit**	**Up**	**FM**	**Confirm**

F2 / New Game: To start a new game, press the F2 function key. You will be asked if you really intend to start a new game. Press either the 'Y' or 'N' key. If you press the 'Y' key, you will be asked to enter a new game name.

F3 / Restore Game: To restore a previously saved game, press the F3 function key. You will be asked if you really intend to restart a saved game. Press either the 'Y' or 'N' key. If you press the 'N' key, you will be asked to enter the name of a previously saved game.

2.5 How to save a game

The game is saved automatically at the end of each turn. You can disable this feature through the function key menu.

How to Enable/Disable the auto-save feature

The auto-save feature is enabled or disabled through the function keys. The feature is toggled on or off through the F4 function key. Exhibit 2.S.1 shows the text windows after pressing the F4 function key while auto-save is enabled.

Exhibit 25.1 — The auto-save prompt

Auto-save is on
Do you wish to turn auto-save off? (Y/N)

To enable or disable auto-save:

1. Press the F4 function key.
2. When asked to confirm the change, press the 'Y' key.
3. If you change your mind, press the 'N' key to continue without changing the auto-save state.

Auto-save is the default

When you start or restart a game, the automatic game save feature is enabled. Ordinarily, you should leave it activated. The auto-save feature provides a running backup of your game.

To explore a risky line of play:

1. Disable the auto-save feature by pressing the F4 function key, then the 'Y' key.
2. Continue to play for one or more turns.
3. If you are satisfied with the result of your play, re-enable auto-save by pressing F4, then the 'Y' key.
4. If the result is not satisfactory, restart the game at the last saved turn by pressing the F3 function key and entering the name of the game.

2.6 How to exit the program

You exit the program by pressing the F5 function key.

How to exit 'Worlds at War'

To exit the game, do the following:

- Press the F5 function key
- When asked to confirm, press the 'Y' key
- If you have changed your mind, press the 'N' key

Don't exit without saving!

If you intend to continue playing at a later date, be sure that you've enable the auto-save feature for the turn before exiting. This is the only way to save the game state.

3. First, some basics...

3.1 A quick start guide

3.1.1 A quick tour of the game displays

To help you get your bearings, follow this quick tour of the game. It introduces some of the game's main features.

Before you start...

You'll need to complete modules 2.1,2.2,2.3 and 2.4 before starting this tour. Come back here after entering the game name in module 2.4.

The configuration screen

You should be looking at the configuration screen. There are lots of options to try, but for now, just press the <Enter> key and accept the default configuration.

The main map display

You are looking at the main map display, now. Your base planet is blinking in the center of the map. The square boxes on the map are called Areas. The channels connecting them are called Hyperspace Paths. Let's look around the map a bit.

Hold the shift key down and press the down arrow key on the numeric keypad. This should scroll the map up one area. Make sure the Num Lock key is off. Press Shift-down arrow key a few more times, then try the other arrow keys. You can use the scroll feature to move anywhere on the map, but it's awkward on a large map, so...

The Full Map Display

Press the F8 function key. You're now looking at the full map display. The blinking rectangles (colored on a color display) represent areas which contain items of interest: a planet, a vehicle, or a cosmic gale. Notice the buttons in the sidebar window. All the buttons are now on. Press the 'G' key. 'G' is for Gale. All the other buttons go off and now only the areas containing gales are blinking. Press the 'P' key. Now only the areas containing planets are blinking.

Notice the pointing hand which is positioned somewhere near the top row. Use the arrow keys to move the hand to a blinking area. Then press the enter key. The map will now be

redrawn with the selected area in the center. You can use the Full Map Display to zoom quickly from one region of the map to another.

The Victory Point Display

Press the F7 Key. You're now looking at the Victory Point Display. There aren't any points charted yet, but these graphs help you keep a running tally of both Neutral Planet Points and total Victory Points. You'll find this to be a very useful display. Press the enter key to return to the map display.

The Side Bar Display

Turn your attention to the side bar window on the left side of the screen. The top section of this bar contain six indicators, one for each game-turn phase. The Production indicator should be highlighted now, since we are in the production phase.

Below that are two boxes, both of which contain the number 0. These indicate the current victory points for each side. Your box is on the left, the computer's is on the right Tie score, but not for long...

Below this is a window used for various displays. Right now it contains your base planet's production box. A little while ago it contained the control buttons for the Full Map Display.

The Text Windows

At the very top of the screen are two text windows. These windows will send you a variety of messages, depending on the game state.

3. First, some basics...
3.1 A quick start guide

3.1.2 Building your first fleet

You start the game with a single base planet and a large number of production points. These points are used to build your fleet.

The Planetary Build Box...

Turn your attention to the sidebar window. In this window is displayed the production box for your base planet

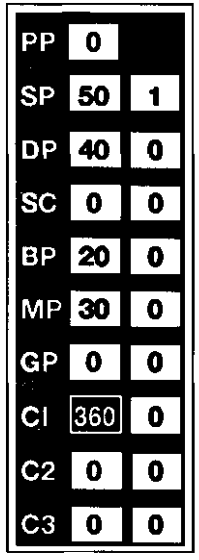


Exhibit 3.1.2.1

The box labeled PP contains the number 500. This is the number of Production Points available. Exhibit 3.1.2.1 shows the production categories and their meaning.

Box	Description	Used For
PP	Production Points	Planet & TF
SP	Staying Power	Planet & TF
DP	Defensive Power	Planet & TF
SC	Scouts	Planet & TF
BP	Bomber Power	Planet & TF
MP	Missile Power	Planet & TF
GP	Short-Ranged Gun power	Planet &TF
C1	TF Construction Project #1	Planet Only
C2	TF Construction Project #2	Planet Only
C3	TF Construction Project #3	Planet Only
MLC	Marine Landing Craft	TF Only

Exhibit- 3.12.1 —Production Categories

Press the down arrow key on your numeric keypad You may have to first release the Num Lock key. The down arrow key moves the cursor box to the DP field. The up and down arrow keys are used to move the cursor box. Now, reposition the cursor box in the field labeled 'SP'.

Press the right arrow key once. This causes a single point to be moved from the PP box to the SP box. Press the '+' key. This causes 10 points to be moved from the PP box to the SP box.

Now press the left arrow key. This causes a single point to be moved from the SP box to the PP box. Press the '-' key. This causes 10 points to be moved from the SP box to the PP box. The right and left arrow keys are always used to change a field.

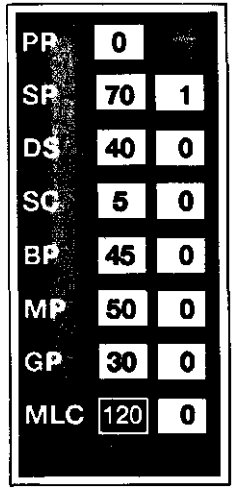
Use the arrow keys and the '+' and '-' keys to allocate all of your production points. Use Exhibit 3.1.2.1 as your guide. Allocate the SP points first, since some of the other categories must always be less than SP. When you are done, accept the allocation by pressing the F10 key.

Task Force allocation...

We allocated most of the production points (360) to category C1 This started a Task Force Construction project The Task Force Build Box is now displayed in the sidebar window. Notice that there are 360 production points in die PP box. Notice also that a new piece has been placed on the map. This piece represents your new Task Force.

Use the arrow keys and the '+' and '-' keys to allocate all of the TF production points. Use Exhibit 3.1.2.2 as your guide. When you are done, accept the allocation by pressing the F10 key.

Exhibit 3.122



3. First, some basics...
3.1 A quick start guide
3.1.3 Playing through a turn

A turn consists of 6 phases. The current phase is indicated in the phase window. You've just completed the first phase, production. This module will guide you quickly through the final 5 phases.

Flight Operations Phase

Secondary pieces are launched during the Flight Operations Phase. Secondary pieces include:

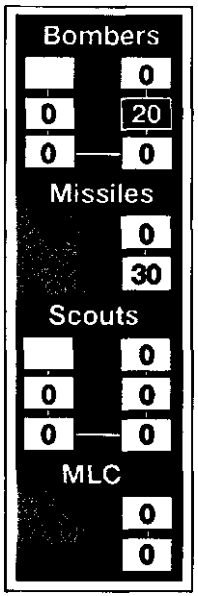


Exhibit 3.13.1

FM — Bomber Formations

BA — Missile Barrages

SC — Scouts

MLC — Marine Landing Craft

You are now looking at your Base Planet's Flight Ops box. Notice that the Base Planet piece is blinking.

To launch a Formation of IS Bombers from your Base Planet, do the following:

- Press the down arrow key once so that the cursor box is in the position shown in Exhibit 3.1.3.1.
- Remember that the up and down arrow keys always select a new field.
- Press the '+' key to move 10 bombers from the ready box to the launch box.
- Press the right arrow key to move 5 more bombers from the ready box to the launch box.
- Press the <Enter> key.

You are now looking at your Task Force's Flight Ops box. Notice that the TF piece is blinking. To terminate the TF Flight Ops Phase, press the F10 key.

You are now back at the Base Planet's Flight Ops box. You can move back and forth between the two Flight Ops boxes by pressing the <Enter> key. Try launching a missile barrage,

either from your base planet or TF. To terminate the Base Planet's Flight Ops phase, press the F10 Key.

Task Force Movement Phase

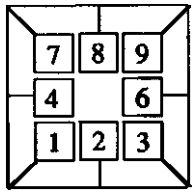


Exhibit 3.1.3.2

You may now move your Task Force. Movement directions are given through the numeric keypad. Exhibit 3.1.3.2 shows the 8 different directions. The Task Force can move two spaces. Use the numeric keypad to move your TF now. You may have to press your Num Lock key to activate your keypad.

The computer's turn...

The computer will now do it's own production flight operations and task force movement You can watch the Phase Window change as the computer steps through these phases.

Flight Unit Movement Phase

All Flight Units (Formations, Barrages and Scouts) are moved during this phase. You have two units to move, a Formation and a Barrage. Each piece has a certain number of movement factors to expend. It costs one MF to cross a single line path, 2 MF to cross a double line path, etc. No movement is possible between areas unless a path connects them.

The Barrage moves first. It can expend up to 8 Movement Factors, or you can terminate it's move at anytime by pressing the <Enter> key.

Next move the Formation up to 6 MF or terminate it's move by pressing the <Enter> key.

Attack Resolution Phase

There will probably be no attacks this first turn, so the computer will skip this phase.

Victory Point Display

The VP Display shows a running total of both Neutral Planet Points and Total Victory Points. Probably no points have been scored yet, so no points will be totaled yet. Press any key to complete the turn.

3.2 What are map areas?

The mapboard consists of a broken grid of rectangular regions called areas. These areas are linked by hyperspace paths. Each area is shaded according to the current visibility in the area. The visibility affects detection. Visibility can change randomly each turn.

The Space Ocean

The vast Space-Ocean contains millions of galaxies and uncounted civilized planets. But only those regions of the universe relatively close to a hyperspace terminus are of interest to the Great Powers.

The reason for this is simple. Hyperspace paths are the only way to get from one distant part of the Space Ocean to another without traveling for many years. These space highways are the main routes for trade, travel and conquest Most regions of the universe are far from a hyperspace terminus and are thus rarely visited by ships from the Great Powers.

The mapboard represents a network of these areas containing an important string of highly fortified, neutral planets.

Visibility

Ships of the Great Powers use sensitive instruments to detect each other. Detection depends both on the distance between the ships, and the visibility in the areas through which detection is being attempted. Visibility is a natural phenomenon, like weather, and changes from turn to turn.

Visibility is classified at three levels:

Figure 3.2.1—Visibility Table

LEVEL	INDEX	DESCRIPTION
Clear	1	no or light shading
Impaired	2	medium shading
Restricted	3	heavy shading

Neutral planets

Each area represents a region of the Space-Ocean which contains many planets. Many of these planets contain life, even advanced civilizations. However, only those civilizations advanced enough to have developed hypernium-proof fortifications are of interest to the Great Powers. The other planets are ignored and are not represented on the map.

Neutral planets are represented by numbers on the map. Each number represents the planet's strategic value and strength. Neutral planets can be used as bases by either of the two Great Powers, either to protect the vital shipping which must pass through this region, or to attack it.

How pieces stack in an area

No area will ever contain more than one civilized planet. There is no restriction on the number of units of either side that may occupy an area.

- Planets will be displayed in the center
- Red Units will stack on the left side
- Blue Units will stack on the right side

3.3 What are paths?

Adjacent map areas are linked by hyperspace paths. An area may be connected to any or all of it's neighbors. All paths are not alike. They are distinguished by the number of movement factors required to cross them.

What are hyperspace paths?

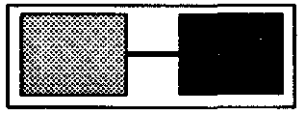
Hyperspace paths are 'holes' in the fabric of the universe. They are natural phenomenon: a hyperspace vehicle can only use paths where they exist They are a varying phenomenon, like the weather. Sometimes they are easy to cross, sometimes more difficult And sometimes they close up altogether.

There are three types of paths, distinguished by the number of movement factors it costs to cross them. They are displayed on the map as single lines, double lines and triple lines. Exhibit 3.3.1 summarizes the number of MF it costs to cross each type of path.

Exhibit 3.3.1— Movement factors

Single Line——1 MF
Double Line——2 MF
Triple Line——3 MF

Exhibit 3.3.2—an example of a single line path



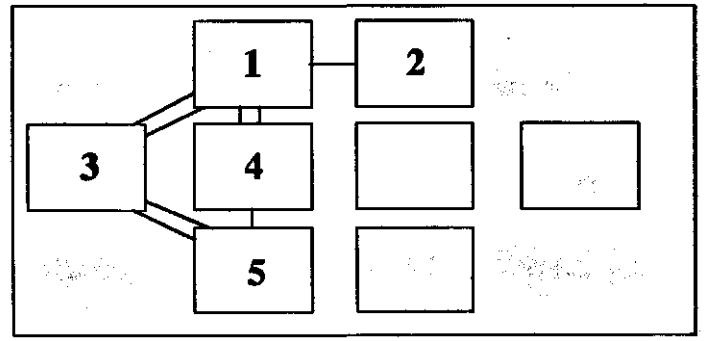
Predicting the path width

At the beginning of each turn, the map is redrawn showing the paths which are available for that turn. From past experience, path forecasters can predict that for any possible path on a particular turn there is a:

- 16.6% chance mat it will be closed entirely
- 33.3% chance that it will be a single line path
- 33.3% chance that it will be a double line path
- 16.6% chance that it will be a triple line path

This information will help you develop flight plans for bombers. Since your planned route may vanish, it's a good idea to have alternate routes available for returning bombers.

Exhibit 3.3.3— Hyperspace Paths



Example: Exhibit 3.3.3 shows a section of a map.

It costs:

From Area 1 to Area 2	1 MF
From Area 1 to Area 3	2 MF
From Area 1 to Area 4	3 MF
From Area 1 to Area 5	5 MF via Area 4
From Area 1 to Area 5	4 MF via Area 3

3.4 Space map or naval map?

There are two different style maps which are supplied for play. The naval map has the merit of simplicity — an excellent map to learn the game with. The space map — paradoxically — gives a game that's more like real naval warfare.

One game — two maps!

The two previous modules have referred to the space map — the map which uses areas and changing hyperspace paths. This space map is actually the more complicated of two maps which are available in the game.

The other map — the one which you've seen if you've played through the quick start game —is called the naval map. These two maps are not as different as they might seem at first glance.

The naval map has areas also — the rectangular regions on the map. But they are arrayed in an unbroken grid — none are missing, as on the space map.

The naval map also has 'paths' — they just aren't drawn. Each area on the naval map is connected to all of its eight neighbors by a single line path — it always costs 1MF to move between areas. The paths are never broken.

You choose which map to use when you start a new game. On the configuration screen is an option labeled:

Space Map? [Y]

The default is yes. If you wish to use the naval map, you must set this option to [N] using the arrow keys.

Which to use?

Both maps are useful and enjoyable. In general:

— The naval map is simpler and gives a quicker game than the space map. You might want to use it for your first few games.

— The naval map has a more 'open' feel to it, and some people just like it better because of that.

— The space map demands more from the planner in you. Also more from the risk taker. Before sending a flight of bombers down a narrow corridor of areas, you have to ask yourself how lucky you feel? Will the bombers be cut off, unable to make it to their target before running out of endurance? Or if they do hit their target, will they be able to find their way back to the TF?

— This uncertainty in movement is what gives the space map its value. In World War II, it was more difficult than you might imagine to send a formation out to strike an enemy carrier. First a scout had to find the target. The positioning information was often wrong. Bombers, typically flying out to their maximum range, had great difficulty finding their target. After dropping their warheads, they were usually low on fuel, wounded, often lost. Many pilots were forced to ditch when their carriers failed to show up at the rendezvous.

— Some recent computer games have tried to duplicate this uncertainty by taking direct control out of the players hands. In this sort of game you would simply order a formation of bombers to attack a certain target The computer would fly the formation, maybe find the target, maybe find its way back to the carrier. It would let you know... The space map gives you the uncertainty, while keeping control where it belongs — in the player's hands.

3.5 Describing the different pieces

Seven different pieces represent the various forces used in "Worlds at War". These are Base Planets, Neutral Planets, Task Forces, Bomber Formations, Missile Barrages, Scouts, and Marine Landing Craft. Except for planets and scouts, the pieces represent groups of warships operating together, rather than a single vehicle. Each piece has special characteristics.

Base planets

As the game begins, each empire has established a base planet at either end of the planet chain. Base planets are fortified strongholds. Supplies from the home planet are funnelled through them. Additional bases can be constructed by capturing a neutral planet and holding it for 10 consecutive turns.

Neutral planets

15

The Neutral Planets represent a chain of powerful, independent planets. These planets could become bases from which to attack or defend the vital shipping lanes which pass among them. They are valued according to their defenses and strategic location. Capture of just a few of these strategically placed, high-value planets can be decisive.

Task Forces

A Task Force is a mix of warships, weapons, defense, scouts and marines. You determine the exact composition of this mix. Not all Task Forces need to contain all these elements. You can build a small task force which just serves as an advance scout base. Or a task force which serves primarily as a marine convoy. Or as a fully balanced fighting force with defense in depth, layered scouting capabilities and long range attack capabilities. The building of your war machine must be an integral part of your overall strategy.

Scout

A scout is a small and difficult to detect hyper-space vehicle. It has good endurance, allowing it to travel long distances. It's lightly armed and depends on stealth for its protection. If it is detected by any other warship, even another scout, it will probably be destroyed. Your scouting plan is critical to your success. You should array your scouts in layers, with some close by your Task Force or Planet, a few in the middle distances, and more a long way out, trying to locate the enemy.

Bombers

Bombers are hyper-space craft large enough to carry a large Hypernium Bomb to its target and return to base. Bombers are launched in groups called Formations. The strength of the formation is equal to the number of bombers which make up the formation. When attacking a well defended target, some bombers are inevitably destroyed during their run-in. These 'hard-kills' result in victory points for the opposition, one per , bomber destroyed. A victory point will be assessed for each bomber which fails to return to base.

Missiles

Missiles are expendable hyper-craft which propel a Hypernium Bomb to its target. They are launched in groups called Barrages. The strength of the barrage is equal to the number of missiles which make up the barrage. The Bomb carried by a missile is equal in strength to the bomb carried by a bomber. Once launched, they must travel to their target or be lost.

Marine landing craft (MLC)

MLC are short range craft capable of delivering an entire division of marines to the surface of a planet They are not capable of hyperspace travel—i.e. they cannot move from one area to another. They play no part in the great naval air battles which swirl around them. Once launched they will transport automatically to the planet Launching a MLC in an area without a planet will cause the craft to be lost with all hands aboard. Once landed, the marines form the planet's garrison and cannot be picked up again.

3.6 How to win the game

Victory points are awarded when you capture and hold a neutral planet, when you inflict damage upon the enemy fleet or base planet. Victory points are awarded to your opponent if you fail to recover scouts or bombers. Finally, VPs are awarded to the player who holds the greatest number of neutral planets at the end of the game. To win you must accumulate more victory points than your opponent.

Points for capturing neutral planets

At the end of each turn, you will receive victory points for each neutral planet which you currently control. Neutral planets are indicated on the map by a number which represents its value per turn in victory points. Since VPs are assessed at the end of each turn, you will receive points the same turn that the planet is captured.

Points for inflicting damage upon the enemy

When you attack your opponent's fleet or base planet with bombers or missiles or short range gunfire, you will receive victory points commensurate with the amount of damage done. Note that combat is a double-edged sword and it is possible that the defending side may accrue more victory points in a battle than the attacking side.

The number of VPs which you will win or lose in a battle depends on the strength of the attack and defense. As a general rule, the stronger side will always win more victory points than the weaker side. Repeating weak attacks will decimate your force and only gain victory points for the opposition. When in doubt, attack with everything you've got, simultaneously if possible!

Points for lost scouts and bombers

Since Scouts and Bombers require crew to pilot them, and crews will always be more valuable than machines (it takes 20 years to build a new pilot, after all) a victory point is always given to the opposing player whenever you lose a scout or bomber, whether the loss is from combat or because the vehicle was unable to return to base before expending all of its endurance factors. Suicide missions are allowed in the game, but the cost can be high.

Points for the line of communication to Green

When the game ends, the number of the neutral planets held by each side is totaled. The player with the higher total is considered to control the shipping lanes to Green. The controlling side is awarded 100 victory points.

Determining the winner

The game length is determined before the game begins. Since game length can profoundly affect your strategy, the game length cannot be changed once the game begins.

The number of turns represents the length of time which the ally, Green, can hold out without supplies.

The winner is the player who has managed to accumulate the larger number of victory points.

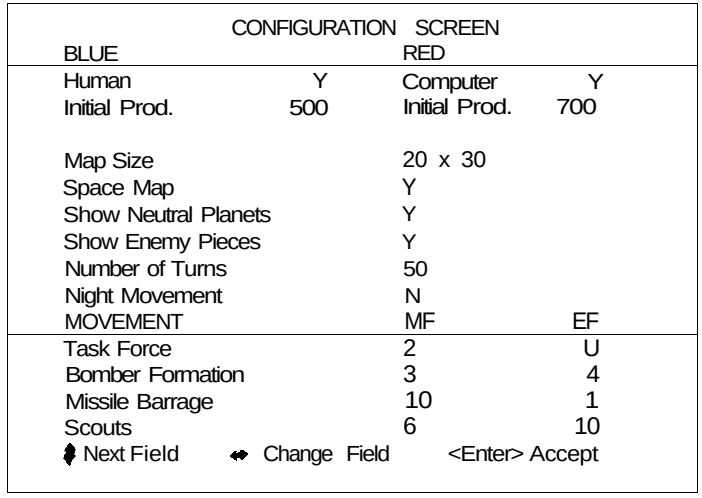
4.1 Using the configuration screen

The configuration screen controls all of the game's optional features. When a new game is started, the configuration is initialized with a set of defaults. Any of the defaults can be changed at the beginning of the game. The game configuration is saved whenever the game is saved

The defaults may be changed by using the Arrow Keys:

To move to the next field above, use the Up Arrow Key to move to the next field below, use the Down Arrow Key to increase or toggle a field, use the Right Arrow Key to decrease or toggle a field, use the Left Arrow Key to accept the changes, hit the Enter Key.

Exhibit 4.1.1 — The default configuration screen



What are the options?

Computer [Y]

Blue must always be played by a person. By default the computer will play Red. If you want a human to play Red, set this option to [N].

Initial Production [500]

There are two initial production numbers, one for Blue and one for Red. This value sets the starting number of production points for each player.

Map Size [20] x [30]

These two values control the X and Y size of the map. These values can range from [10] to [50]. Experiment with long and wide maps.

Space Map [Y]

This option chooses between the Space Map [Y] and the Naval Map [N].

Show Neutral Planets [Y]

If this option is set to [Y], then all neutral planets will be displayed on the map. If set to [N], you will need to use your scouts to locate the neutral planets. Once located, a NP is always displayed on the map.

Show Enemy Pieces [Y]

With this option set to [Y] all pieces are displayed on the map. To invoke the hidden movement option, set this option to [N]. If you use hidden movement, you will need to use your scouts to locate the enemy pieces. Enemy pieces are only displayed while located.

Number of Turns [50]

Set the number of turns. This option can range from 10 to 200.

Night Movement [N]

If this option is set to [Y], then there will be 8 turns of 'daylight' followed by 6 turns of 'night'. Scouts cannot scout, and missiles and bombers cannot attack during night turns.

Movement Factors - MF

The movement factor determines how far a piece can move each turn. Thus it represents the piece's speed.

Endurance Factors - EF

The endurance factor only applies to light units, formations, barrages, scouts. It determines how many turns they can move independently before running out of fuel.

4.2 A summary of the game turn sequence

Each turn is composed of 8 primary phases. In each phase the player or computer performs a specific task or tasks.

Turn sequencing

Each turn of 'Worlds at War' is composed of 8 distinct phases. In each phase, you or the computer will perform specific actions. In a few of the phases, no user input is required. These phases are:

- Map regeneration
- Attack resolution
- Endurance resolution.

Other phases may be skipped if no action is required. For example, if you have not launched any flight units, and thus have none to move, the computer will skip your flight unit movement phase.

Also, the attack resolution phase will be skipped unless an attack has actually occurred.

Turn sequencing for a two person game

Much of the excitement of 'Worlds at War' depends on the secrecy of movement Unless you are using the 'Show Enemy Pieces' option, you shouldn't be able to see the enemies location unless you detect him with your scouts.

Obviously then, when two people play the game, it is necessary for them to take turns sitting in front of the computer screen. It's best if you leave the room when not making your turn.

The game is broken into three main sections. Players take turns with the first two sections and then watch together as attacks are resolved.

When a player has completed a section, a brick wall covers the screen and die players switch seats. The player who's turn it is presses either the 'B' or 'R' key and continues with his move.

Note that it is a horrendous breach of the rules to knock down the other player's wall and peek at his position. Good sportsmanship must prevail on this point!

The turn sequence summary

Produce and allocate production points
- Calculate production for each base planet
- Allocate production points

Conduct flight operations
- Launch scouts
- Launch missiles
- Launch bombers
- Launch marines

Move task forces

Detect enemy units from planets

Move flight units
- Move scouts, detect while moving
- Move missiles, detect while moving
- Move bombers, detect while moving

Resolve attacks
- Resolve naval attacks
- Resolve marine attacks

Remove endurance
- Reduce the EF flight units by 1
- Remove unit from game if it has O EF

Regenerate map
- Determine the visibility in each area
- Change hyperspace paths
- Redraw map

Exhibit 4.2.1 — The game turn sequence. Heavy bars mark the three main sections.

4.3.1 Using the production box

Supplies from your home planet (off board) are funnelled through your base planet. Supplies are represented by production points. Production points can be allocated to projects on the base planet itself, or to task force construction or task force refit projects. Production not used is subject to spoilage.

How to allocate production points

Each turn, supplies in the form of production points, will be available at your base planet Production points are allocated through Production Boxes. Exhibit 4.3.1 shows such a box.

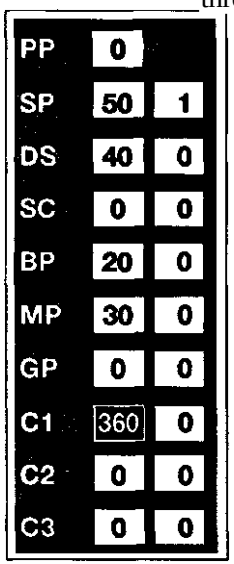


Exhibit 4.3.1 — Planetary production box

The box labeled 'PP' shows the number of points available. These points can be allocated to any of the boxes which are displayed below. To allocate points do the following:

- To select a category (example, staying power) move the cursor box by pressing the up or down arrow keys.
- To transfer production points to the selected category, press the right arrow key or the '+' key.
- If you change your mind, points can be moved from the highlighted category back to the PP box by pressing the left arrow key or the '-' key.
- To complete the allocation process, press the F10 key.

Example: To allocate 30 production point to SP:

1. Press the up or down arrow key until the cursor box is positioned on the staying power line.
2. Press the '+' key 3 times, or press the right arrow key and hold it down until the box has the number 30 in it

Limits on production — staying power

There are a few rules you must remember about production points:

- the number of points allocated to a category must be less than the current staying power. There are two exceptions to this rule:
  - there is no limit to the number of points allocated to construction projects or MLC
  - the number of points allocated to bombers and scouts combined must be less than the staying power.

Pregame production

You receive most of your production points at the beginning of the game. These represent a stockpile which you have built up over a long period of time. Use these points carefully to build up your base planet and your fleet The number of points which you will receive in subsequent turns will be small and not enough to cover strategic production errors.

Production during the game

Your base planet produces PPs during the game which can be allocated to any project The number of points produced is equal to:

10* log (staying power + NP points)

You can see that it's very difficult to get more than 20 or so points per turn through your base planet.

4.3.2 The production point categories

Every base planet and task force has a production box. The production box used for planets is almost the same as that used for task forces. The planet production box has categories for task force construction projects; the task force production box has a category for marine landing craft (MLC).

The production point categories

- **Offensive categories**
  - BP - Bomber power
  - MP - Missile power
  - GP - Short range gun power
  - MLC - Marine landing craft
- **Defensive categories**
  - DP - Defense power
  - SP - Staying power
- **Scouting categories**
  - SC - Scouting power
- **Construction categories**
  - C1 - TF construction project #1
  - C2 - TF construction project #2
  - C3 - TF construction project #3

A brief description of each category

BP: The number of bombers carried by the unit (planet or TF)

MP: The number of missiles carried by the unit

GP: The number of short range guns mounted on the unit. Each gun can project a single hypernium bomb each turn. Short ranged guns can not fire bombs across hyperspace paths. They never run out of ammo. The limiting factor in combat is not the number of projectiles, but the difficulty in delivering them, especially across hyperspace paths.

MLC: The number of marine landing craft carried by the unit Each MLC carries a marine division and all of its equipment.

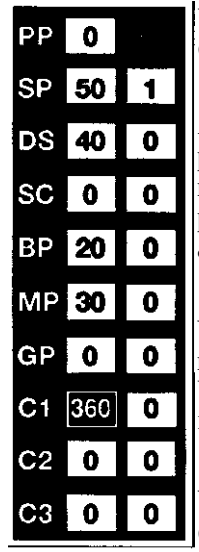
DP: The unit's defense strength. The defense acts as a filter. It stops all attackers up to the number of DPs. A hypernium bomb (whether delivered by bomber, missile or gun) which penetrates the defense is called a 'hit'.

SP: The unit's staying power. The staying power affects the amount of damage done by bombs which penetrate the defense. The more staying power, the less damage a hit will have.

SC: The number of scouts carried by the unit.

Cl, C2, C3: Task force construction projects.

Construction projects and dry docks



Your base planet has 3 'dry docks' in space. Each dry dock can handle one task force.

A new task force can be started by allocating production points to an empty dry dock. A dry dock is empty if there are no points in either column of the Cn category. A new TF production box will be opened, and you will be able to allocate points within the TF, as you like.

You can transfer production points to the TF for as long as it remains in dry dock. Once it leaves dry dock (by leaving the base planet's area), no more points can be allocated until it returns.

When a task force returns to the base planet's area, it will enter a dry dock automatically, if one is vacant Dry docks are allocated on a first come, first served basis.

Being in dry dock does not affect the TF's ability to fight

4.3.3 Suggestions for building a TF or base planet

The first step in building a fleet is to decide on an overall strategy. Will you be going after neutral planets? Then you'll need marine transports and a powerful fleet to screen them. Will you attack your opponent's home planet? Good hick! Better have a powerful, battleship-style task force that can move in and blast away, turn after turn, until the planet is a molten pile of rubble.

A few sample configurations

Although there are many ways to configure a task force, we will consider just a few representative types. In the examples below, the diagram at left gives a sample configuration. The text at right relates the configuration to a naval example, and gives our thoughts behind the construction.

Carrier Battle Group: Total Points = 230

BP	**45**
MP	**50**
GP	**30**
DP	**50**
SP	**50**
CS	**5**
MLC	**0**

Strengths: Long reach, powerful missile and bomber threat make this a formidable battle group. Balanced configuration, strong defense enables the group to move into harms way. Short-ranged guns are more than adequate, since this group will probably never engage in short range combat

Weaknesses: Scouting is a little thin, perhaps a bp/sc of 40/10 would be a better choice. Cost is high for a single group. If you begin the game with 500 production points, you may not be able to afford such an expensive TF.

Missions: Screen for marine landings, search and destroy missions, just about anything.

Battleship Task Grp: Total Points = 210

BP	**0**
MP	**50**
GP	**50**
DP	**50**
SP	**50**
CS	**10**
MLC	**0**

Strengths: Powerful missile threat for preemptive strike against target, short ranged guns which, since they can fire every turn, could be devastating.

Weaknesses: Dependant on short range guns. Must strike first with missiles to eliminate counter-strike from bombers. Must somehow close with the target.

Missions: Planet bombardment Could be devastating against a weakly defended Carrier Group, if you can get close enough to fire those short range guns!

Mobile Scout Base: Total Points = 60

BP	**0**
MP	**0**
GP	**0**
DP	**20**
SP	**20**
CS	**20**
MLC	**0**

Strengths: Scouting.

Weaknesses: Just about everyone else will need to depend on stealth for survival. Will want to keep to poor visibility areas since Avoid threats.

Missions: Scout base in remote regions of the map. Should be able to survive as long as it remains hidden.

Marine Convoy: Total Points = 120

BP	**0**
MP	**0**
GP	**0**
DP	**20**
SP	**50**
CS	**0**
MLC	**50**

Strengths: Assaulting neutral planets.

Weaknesses: Could use some more DP if you can afford them. Needs to be screened by a powerful naval group, unless the planet they attack is really isolated.

Missions: Attacking neutral planets.

Base Planet: Total Points = 155

BP	**0**
MP	**0**
GP	**30**
DP	**60**
SP	**60**
CS	**5**
MLC	**0**

Strengths: Strong defense, good staying power. Can threaten Battleship groups that close for bombardment

Weaknesses: Cannot react to long range attack. Depends on naval forces in area to guard against long range threat

Missions: Serve as base to naval task forces.

4.4 Launching flight units

During the flight operations phase, you can launch or recover flight units from your base planet or any of your task forces. Flight operations are conducted by using the Flight Ops Box.

Flight units

The following are called flight units for the purpose of this game:

- Bombers
- Missiles
- Scouts
- Marine Landing Craft

The basic flight ops diagram

Exhibit 4.4.1 shows the basic flight ops diagram. The boxes in the flight ops diagram trace the flight cycle of a flight unit This cycle is:

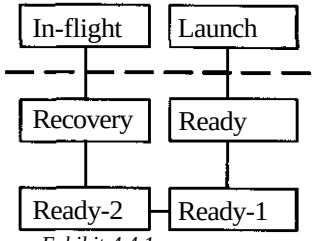


Exhibit 4.4.1

Ready: armed and ready
Launch: launched into space
In flight: in flight
Recovery: recovered
Ready-2: ready in 2 turns
Ready-1: ready in I turn
Ready: armed and ready

Missiles and MLC have partial diagrams, since missiles and MLC are never recovered.

Two basic operations

There are two basic flight operations:

- launching flight units
- recovering flight units

In general, you can launch and recover as many flight units as you like, however, there are several things you should know:

All the bombers launched in a turn from a single bomber formation. Therefore, each platform can launch one formation per turn.

All the missiles launched in a turn form a single missile barrage. Therefore, each platform can launch one barrage per turn.

How to conduct a flight operation

- Choose a launch or recovery operation (e.g. Launch Scouts)
- Move the cursor box to the selected launch or recover box by using the right or left arrow keys. The left arrow key will move the box to the left or up. The right arrow key will move the box to the right or down.
- Launch or Recover flight units by pressing the up or down arrow keys. The up arrow key will launch units. The down arrow key will recover units, or allow you to change your mind if you launch too many units.
- Press the <Enter> key to switch launch platforms.
- Press the F10 key to terminate the flight operations phase.

The bomber in-flight box

The bomber in-flight box is different from the other boxes. It contains two numbers, instead of one. The first is the number of bombers in the formation. The second is the endurance of the formation. All of the formations in the area can be viewed, one at a time, by pressing the 'N' key on the keyboard.

Example: There are two formations in the base planet area:

formation 1 has 20 bombers, 2 EF

formation 2 has 18 bombers, 1 EF

With the cursor box positioned in the bomber recovery box. we see '20/2' which represents the first formation. After pressing the 'N' key, we see' 18/1' representing the second formation. Pressing the 'N' key again returns us to the first formation.

The scout in-flight box

The scout in-flight box is different from the other boxes. It contains a single number, but this number represents the endurance factors remaining for the scout All of the scouts in the area can be viewed, one at a time, by pressing the 'N' key on the keyboard.

4.5 Moving task forces and flight units

You can move your task forces and flight units every turn. Two numbers control how far and how fast a piece moves. The movement factor (MF) controls how far a piece can move each turn (speed). The endurance factor (EF) controls how many turns a piece can move independently before returning to base.

Movement factors

Each piece can expend a certain number of movement factors each turn. MF are 'spent' by crossing hyperspace paths. The cost is equal to the number of lines in the path; it costs 1 MF to cross a single line path, 2 MF for a double line path, etc.

SP	MF
40+	MF
20-39	MF/2
0–19	1

Exhibit 4.5.1-TF movement factors

A task force's MF is based on it's staying power. The larger the TF, the faster it moves. If its SP is reduced by combat, it can be almost immobilized.

When a piece has used up all of its MF, or the only paths available cost more than the number of MF remaining, the piece must end its turn. Leftover MF are lost You end a piece's turn at any time by pressing the <Enter> key.

Piece	MF	EF
Task force	4	Unlimited
Bomber	12	4
Scout	10	10
Missile	15	1

Exhibit 4.5.1 — Default MF & EF

Endurance factors

Each piece has an endurance factor. An endurance factor is spent each turn the piece moves independently. When the number of EF is reduced to 0, then the piece runs out of energy and is destroyed (crashes into the Space Ocean?)

Task forces have unlimited endurance; they never have to return to any base. Bombers and scouts must return to a TF or planet before running out of EF. Missiles must reach their target before running out of EF.

The number of EF available for each piece can be changed through the configuration screen. The defaults shown in Exhibit 4.5.1.

How to move a piece

There is a separate movement phase tor each type of piece. All task forces are moved before all scouts are moved, etc. When it is time for a piece to move:

- the piece will be highlighted on the map
- its status box is displayed in the side bar
- its current MF and EF are displayed in the text window

Move the piece by pressing the arrow keys. Each time you move the piece across a hyperspace path, you will spend some MF. When the piece runs out of MF, its turn is over and the next piece to be moved will be highlighted.

If you wish to complete a piece's move while it still has MF remaining, press the <Enter> key.

When you press <Enter> on a TF, you switch to the next TF. To terminate the TF movement phase, press F10.

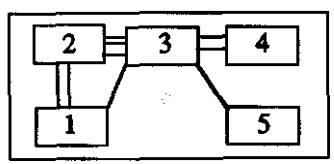


Exhibit 4.5.2

Example: A task force begins its turn in area 1 (see Exhibit 4.5.2). It has 2 MF to spend. It can now either move to area 2 (using all 2 of its MF and ending its turn), or to area 3 (using 1 MF). If it moves to area 3, it will have 1 MF remaining. It can then proceed to area 5 where it must end its turn. Or stop in area 3 by pressing the <Enter> key. Terminate the TF movement phase by pressing the F10 key.

4.6 How to detect the enemy

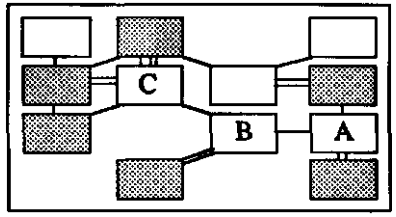
Scouts are the 'Eyes of the Fleet'. While other pieces can detect other units in their own areas, only scouts are capable of conducting efficient search operations.

How scouts and the other pieces search

All pieces, except for scouts, search only the areas which they occupy. Scouts search the area they occupy plus any adjacent areas connected by a path.

Movable pieces search as they move. Searching is automatic. Planets search their own area just prior to the Scout Movement Phase.

Exhibit 4.6.1



Example: In exhibit 4.6.1, the scout moves from area A to area C. Li the process it searches all the shaded areas. In contrast, a Task Force moving from A to C would only search A, B, and C.

The odds of detection

A scout can detect an enemy in its own area, or an adjacent area, if the area is connected by a path. The chance of detection depends on two factors:

- The distance to to the enemy, in MF
- The visibility in the area the enemy occupies

If the enemy is in the same area as the scout, then the distance is zero.

In general, the closer the enemy (counted in MF) the better the odds of detection. Also, the better the visibility in the area the enemy occupies, the better the odds of detection.

Counter detection

As a scout moves and searches, there is a (small) possibility that it may be detected itself. If a scout is detected, even by another scout, there is a good chance that it will be destroyed. A scout that is destroyed will vaporize. It may or may not have a chance to report the enemy contact

How to use auto-scouting

If moving a dozen or more scouts each turn sounds like a bit too much, don't fear! Let the computer's Artificial Intelligence take over the drudgery of the scouting job!

If you use the auto-scouting option (default), the computer will control all scouts which are not moved manually. This gives you good general coverage of the area surrounding a scout carrying TF or planet You can still use a scout or two for special purposes, but you'll find that auto-scouting greatly simplifies the scouting task.

To use auto-scouting, allocate scouts to a TF or planet. Any scouts which you do not launch and move manually will be used by the auto-scouting commander. Several things you should know:

- Auto-scouting is done at the beginning of the flight operations phase (before manual scouts are moved).
- The effectiveness of auto-scouting is dependant on range, weather, and the type of target being detected. Also the number of scouts in action. In general, 20-30 scouts spread over your task forces and base planets should do an adequate job.
- If auto-scouting detects an enemy piece or neutral planet, it will be displayed on the map but you will not see your scouts being moved on the map.

4.7 How Detection is Resolved

It is not necessary to calculate the chance of detection every tune you move a scout (this is a computer game, after all) but it is a good idea to get a feeling for the chances so that you can conduct your searches in an intelligent way.

The effective scouting distance and modified dice roll

To determine if a scout (or other piece) detects an enemy piece, the computer needs three bits of information:

- The distance, in MF between the scout and the enemy piece. (If (hey occupy the same area, then the distance is zero).
- The visibility in the area which the enemy piece occupies
- The enemy piece type (whether it is a TF, planet, formation, etc.)

The effective scouting distance is obtained by adding the distance to the visibility factor. The visibility factor can be obtained from Exhibit 4.7.1.

Exhibit 4.7.1

Visibility	Visibility Factor
Good	1
Fair	2
Poor	3

ESD = distance + visibility

Example: A scout attempts to detect an enemy piece in the next area. The areas are connected by a 2 line path. The visibility in the enemy area is Fair (2). Therefore, the effective scouting distance is 2 + 2 = 4.

A modified dice roll is obtained by generating a random number between 1 and 6 (the same as rolling a single die), and adding a modifier. The modifier is selected according to the enemy piece type. The modifier can be obtained from exhibit 4.7.2. You can see that the larger the piece, the smaller the modifier. A small modifier makes the piece easier to detect

Exhibit 4.7.2

Type	Modifier
Plane	-2
Task Force	-1
Formation	0
Barrage	0
Scout	2

The detection result table

These two numbers, the **effective scouting distance** and the modified dice roll, are used to look up the scouting result in the detection results table. If the result is 'D' then the enemy is detected. If not, then it remains hidden.

The detection result table is given in Exhibit 4.7.3.

Detection results table

Effective Scouting	Modified Dice Roll: -1	0	1	2	3	4	5	6	7	8
1	D	D	D	D	D	D	D	D	-	-
2	D	D	D	D	D	-	-	-	-	-
3	D	D	D	D	-	-	-	-	-	-
4	D	D	D	-	-	-	-	-	-	-
5	D	D	-	-	-	-	-	-	-	-
6	D	-	-	-	-	-	-	-	-	-

Example: Continuing the previous example (remember, the ESD was 4), the computer rolls a 3. If the enemy piece is a planet (modifier = -2) then it is detected. If it is a task force (modifier = -1) then it is not detected.

4.8 How Naval Combat Is Resolved

When you move attacking pieces (Formations Barrages or TFs equipped with short range guns) into an area containing enemy pieces combat will result automatically. All the defending pieces cooperate in the defense. The attack is divided into 3 sub-phases: early, on time, and late. Pieces which attack in the same subphase are coordinated and attack simultaneously.

Area defenses

The nature of space warfare is such that all of the defending units in an area are able to coordinate their defenses. Thus when you attack an area containing the enemy Base Planet and a powerful enemy Task Force the Defense Points of the Base and TF are added together to form a powerful defense.

Example: Suppose you attack an area containing two TFs The first has 55 DP, the second 34 DP. The combined DP would be:

55 + 34 = 89DP.

Attack coordination

When two or more attacks are made against the same target in the same turn they may be coordinated, i.e. occur simultaneously. Coordinated attacks are considered to be a single attack and thus are more effective than if the individual attacks had been made separately.

For example two attacks of 40 strike points each made separately against a target with 40 defense points will cause little damage to the target (the first attacker will weaken the target's defenses however and the second attacker will have some success). If the attacks were coordinated the effective attack would be 80 strike points against 40 defense points resulting in 40 hits received and considerable damage to the target.

The attack phase is split into 3 sub-phases: Early, On-Time, and Late. Each attacking piece will attack during one of these sub-phases. You have no control over the subphase in which a piece will attack. That is determined by chance. If two or more pieces attack during the same subphase, then they are considered to be coordinated and their strike points are combined into a single attack.

Exhibit 4.8.1

Subphase	Probability
Early	16.6%
On time	66.6%
Late	16.6%

Exhibit 4.8.1 is a table which shows the probability that a piece will attack during a particular subphase. The commander of each attacking squadron will attempt to arrive at the attack on time, but the chance of war will occasionally prevent them from doing so. Of course it's possible that two attackers will both be early or late and so wind up coordinated anyway!

Attack effectively first!

This is the ruling maxim in naval warfare, and it applies to space warfare as well. When two task forces of equal strength meet in combat, the first to detect and attack the other effectively will reduce the stricken TF to such a degree that it will be unable to respond with an effective attack of its own.

Unlike land warfare, where reserves are essential, in naval warfare it is usually unwise to hold back reserves. You should always strive to bring all of your attacking power together at once upon a target. This will result in the most effective attack possible, (thus inflicting the most damage upon your enemy), and cause the fewest casualties among your bombers.

4.9 Resolving marine combat

The capture of neutral planets is essential to your success. You capture neutral planets by landing marines. Your success will depend on the ratio Or attackers to defenders. Obviously the stronger the attack, the more likely it is to succeed.

Neutral planets

Neutral planets are represented on the game map by a number which represents both its defensive strength and its value in Victory Points.

Neutral planets can be displayed on the map in two ways:

- Hidden until discovered
- Always displayed

You decide which method to use at the beginning of the game, through the configuration screen.

If you decide to use the 'hidden until discovered' option, you will need to detect neutral planets with your scouts. Once detected, the planet will always be displayed on the map.

The 'always displayed' option results in a quicker game and is always used in the Basic Game.

How to attack neutral planets

You attack a neutral planet (we always call them neutral planets even when they have been occupied by one of the players) by landing marines.

To land marines you must

- Move a Task Force with Marines aboard into the planet's area.
- During the TF's Flight Operations Phase, launch a number of Marine Landing Craft. The number launched will be the strength of the attack.

- During the Neutral Planet Attack Resolution Phase, the computer will determine the result of your attack. The possible results are:
- attackers destroyed
- defenders demoralized
- defenders destroyed

Only a result of defenders destroyed will give you control of the planet

The chance of your attack succeeding is determined by the ratio of attack strength to defense strength. An attack where your attack strength is twice as great as the planets defense strength is much more likely to succeed than an attack where you are out numbered by the defenders.

All results except defenders destroyed result in the total elimination of the attackers. Successful attackers become the planet's garrison and may not be removed from the planet

Defenders demoralized

Demoralizing the defenders makes them easier to defeat in subsequent attacks. Each turn the defenders have a chance to rally. If they do so, they return to full strength.

Neutral Planets can rebel!

The inhabitants of the neutral planets will resist the occupation by either side — they always were an uncooperative lot. Occasionally, they will be successful and your garrison will be thrown over and slaughtered. Your only recourse is to reconquer the savages.

Reinforcements

If a planet which you control is attacked by the opposing player, you can reinforce your garrison on the planet by landing marines of your own. These marines will be added to the planet's defense —*for that turn only!*

4.10 Neutral planets convert to base planets

A neutral planet will convert to a base planet if you can conquer it and then hold it for 10 consecutive turns. By building a chain of base planets, you can extend your strategic reach deep into enemy territory.

How to convert a NP into a base planet

To convert a neutral planet into a base planet you must:

- Conquer it with marine forces (see section 4.9, Resolving marine combat).
- Hold it for 10 consecutive turns.

If the planet rebels or is conquered by enemy marines, you will need to reconquer it and hold it for 10 additional turns to build a base.

Note that if your NP is being attacked by enemy marines, you can reinforce your garrison on the planet by landing marines of your own. These marines will be added to the planet's defense — for *that turn only!*

Example: You own a 20 point NP. You and your opponent both have TFs in the area. You land 10 marines, your opponent lands 20. The attack ratio will be 20 attack points against 30 defense points. Note that reinforcements are effective only on the turn they are landed.

When the planet converts...

The initial production of your new base will be 10 times the value of the planet. Thus a 10 point planet will begin with 100 production points. A 30 point planet will begin with 300 production points.

The new base planet will no longer be subject to marine attacks. It must be attacked with naval forces, i.e. bombers, missiles or short ranged guns. Landing marines on a base planet has no effect (other than to kill the marines).

Your new base functions just as your original base planet. You can use it to resupply your TFs, to build new TFs, or as a base for naval forces such as bombers or missiles.

You will continue to receive Neutral Planet points for your new base.

If destroyed by naval force...

If the base planet is destroyed by opposing naval forces, it converts back to a neutral planet (i.e. the base is destroyed but the underlying planet is not). The NP will be controlled by the attacking side. A new enemy base will be built if the NP is held for 10 consecutive turns.

Example: Blue controls a forward base planet. It is attacked by a powerful Red force and destroyed. Next turn, the neutral planet will reappear on the map — the base will be gone. The NP will be drawn in red. In 10 turns, a new red base will be built on the planet

5.1 How to scroll the map

The map window is a viewport through which we see a part of the whole map. To see other parts of the map, we move the map window up or down, to the right or to the left. Moving the map window is called scrolling.

Why Scroll?

Even if the map is very small (10x10 areas), you won't be able to see it all at once. The map window acts as a viewport into a portion of the map. You see the other parts of the map by scrolling the map window.

How to scroll

You can scroll the map at any time. To scroll the map:

- Hold down the shift key
- Press one of the arrow keys
- The map will scroll 8 areas in that direction.

Example: Exhibit 5.1.2 shows the whole map. Rectangle A represents the region of the map displayed in the map window before scrolling. Rectangle B represents the region of the map displayed after a scroll up.

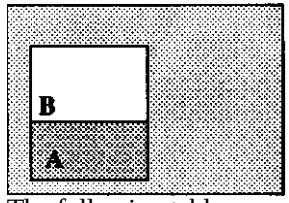


Exhibit 5.1.2

The following table summarizes scrolling operations:

Operation	Key Stroke
move map window up	shift-up
move map window down	shift-down
move map window right	shift-right
move map window left	shift-left

Exhibit 5.1.1

5.2 Interpreting the combat resolution screen

Four different events are reported during the attack resolution phase: Naval attacks, marine attacks against neutral planets, neutral planets that rally, neutral planets that rebel

Naval attack resolution box

A naval attack is an attack by bombers, missiles, or short-ranged guns against a Task Force or Base Planet. The results of a naval attack are reported in the naval attack resolution box. Exhibit 5.2.1 shows such a box.

There are four parts to the box:

The coordination line

When two or more forces attack the same target simultaneously, they are said to be coordinated. The attacks of coordinated forces are combined into a single attack. Attackers may be early, on time or late. The coordination line specifies the time of the attack being reported.

The attacker's box

The attacker's box shows the type of forces making the attack, their strength, and the number of attackers destroyed.

Type	The type of force: FM-bomber formation BA-missile barrage GP-short range guns
AP	The strength of the attacking force
HK	The number of hard kills, or attackers destroyed by the defense

The defender's box

The defender's box shows the type of forces participating in the defense. Remember that when TFs or planets occupy the same area, their defenses are always combined.

Type	The type of defending unit TF-Task Force PL-Base Planet
DP	The strength of the defending force
Hits	The amount of damage done by hits which penetrate the defense.

The VP line

The Victory Point line reports the result of the attack in terms of victory points for each side.

Example: Exhibit 5.2.1 shows the results of a typical attack. Blue has attacked Red with two forces:

- A formation of bombers, strength 60
- A barrage of missiles, strength 45

Red defends with a single task force, defense strength 50.

The hard kill results:

8 bombers destroyed

6 missiles destroyed

The number of hits:

210 point of damage to the Red TF.

Victory Points:

Blue scores 238 points

Red scores 8 points

Assessment: A good attack for Blue — inflicts a significant amount of damage on Red while minimizing his own losses.

ATTACK: On Time

Type	AP	HK
BA	45	6
FM	60	8

Type	DP	Hits
TF	50	210

	Blue	Red
VP	238	8

Exhibit 5.2.1
The attack resolution box

5.4 How to View the Victory Point Display

The victory point display can be accessed at any time through the menu system. It consists of two graphs: The first displays the turn-by-turn value of neutral planets controlled by each side. The second displays the turn-by-turn totals of victory points accrued by each side.

To access the victory point display

To access the victory point display, press the F7 function key.

To return to the main map display, press the <Enter> key.

The neutral planet graph

The neutral planet graph shows the value of the neutral planets held by each player for each turn of the game. This gives you a useful history of your success relative to your opponent Remember that points accrue every turn to the player who controls a neutral planet. These points mount up rapidly. If you allow your opponent to get an early lead, you'll have to work hard to overcome this disadvantage. This could include:

- destroying his base planet (a sure way to win the game, but tough to do)
- controlling more NP points at game end and thus obtaining the 100 point bonus
- winning a dramatic naval victory
- or (you fill in your own idea)

The victory point graph

The victory point graph shows the number of victory points won by each player for each turn of the game. This gives a useful history of your VP success relative to your opponent. There are different ways to interpret this graph, but in general, the relative slopes of the two lines are important indicators of performance.

If they are roughly parallel, then even if you are behind you have a good chance of making up the difference. If your opponent's graph is very steep and yours is not, then he is accruing VPs at a faster rate than you are and you will have to score some big successes just to keep from falling further behind.

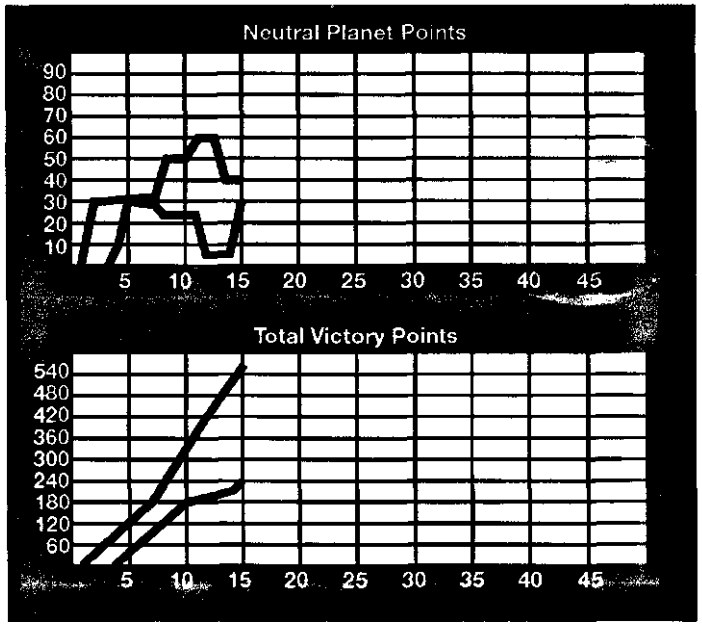


Exhibit 5.4.1

Example: In Exhibit 5.4.1, Blue's VP graph is steeper than Red's. He is rapidly gaining ground over his opponent The reason is obvious if you look at the neutral planet graph. Blue controls significantly more NP points than Red and receives their points each turn thus widening the gap. Red must capture some of Blue's high value planets to stem the VP hemorrhage.

5.5 Using the full map screen

The full map display lets you see the whole map at once. Areas which contain friendly units and planets are highlighted. Areas which contain detected enemy units and planets are also highlighted The full map display gives you a snapshot look at the whole battle.

How to access the full map display

The full map display replaces the close up map in the map window. To switch to the full map, press the F8 function key. To return to the close up map, press the <Enter> key.

Whereas the normal map view gives you a close up look at a few of the areas on the map, the full map view gives you a look at the whole map. Only areas are shown on the full map, not paths. This is due to the restricted resolution of most video screens.

Areas which contain friendly units or detected enemy units are highlighted. On color monitors, they blink and are color coded: Blue and Red. On monochrome monitors they just blink: Blue's units blink quickly; Red's units blink slowly.

UNITS	COLOR	MONOCHROME
BLUE	Blue	Blinks Quickly
RED	Red	Blinks Slowly
NP	Yellow	Blinks Slowly
GALE	Green	Blinks Slowly

Exhibit 5.5.1— Highlighting

The Full Map Control Panel

When the full map is displayed in the map window, a column of control buttons is displayed in the status window. These buttons are labeled, Planets, Task Forces, Bombers, Scouts, MLC. If a button is on, then areas which contain units of that type are highlighted. By default all of the buttons are on when the map is first displayed.

Control buttons which are off are displayed in reverse video.

You can view areas which contain units of a single piece type by pressing the first letter of the button's label.

You can add areas which contain other piece types by holding down the shift key and pressing the first letter of the button's label.

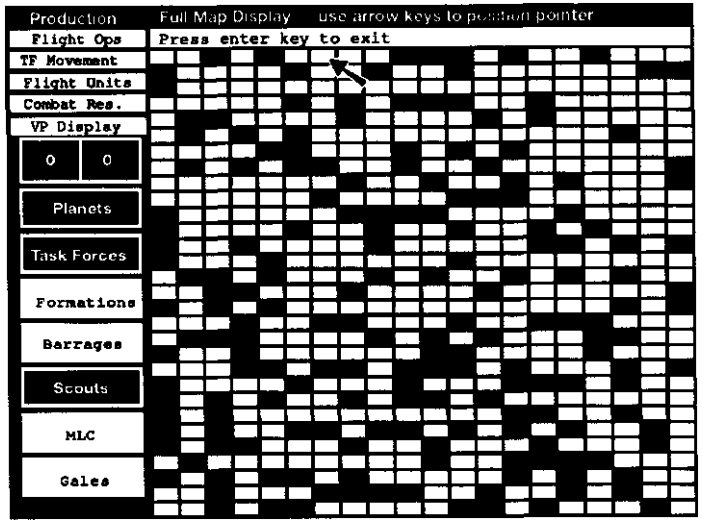


Exhibit 5.5.2 — The full map display

Example: To display only task forces, press the 'T' key. If you wish to add scouts, hold down the shift key and press the 'S' key. If you now wish to see only planets, press the 'P' key.

5.6 Using the full map screen to zoom

Scrolling from one end of a large map to the other is tedious. It's also easy to get lost. You can use the full map display to zoom quickly from one part of the map to another.

How to switch to the full map display

You can switch to the full map display at any time by pressing the F8 function key. Switch back to the close up map by pressing the Enter key.

When you return to the close up map, normally you will return to the same section you started from. But it is possible to return to a different section, even one on the opposite end of the map. When you switch to the full map display, you will notice a pointing hand on the map. It points to one of the areas. This area was in the center of the close up map. If you now press the <Enter> key, you will return to the close up map, and this area will again be in the center.

However, you can move the pointing hand anywhere on the full map display. Move the hand by pressing the arrow keys. It is not possible to move it off the map display. If you press the <Enter> key, you will return to the close up map. Whichever area was pointed to by the hand, will be the one positioned in the center of the close-up map.

How to zoom

• Switch to the full map display by pressing the F8 key.

• The pointing hand points to the starting area.

• Move the pointing hand to the ending area by pressing the arrow keys.

• Switch back to the close up display by pressing the <Enter> key.

• The area pointed to will now be positioned in the center of the close up map.

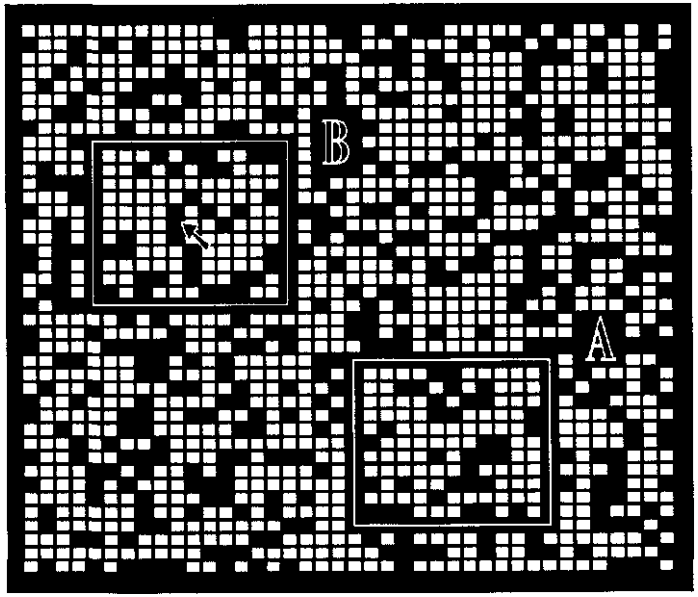


Exhibit 5.5.1 — The full map display

Example: Exhibit 5.5.1 shows the full map display. Rectangle A shows the section of the map which had been displayed in the close up map before zooming. The pointing hand is moved up and to the left by pressing the arrow keys. Rectangle B shows the section of the map which will be displayed in the close up map after zooming.

6. Notes on basic game strategy

6.1 How to attack task forces and planets

Understanding a few of the principles of naval warfare will greatly enhance your chance of success and increase your enjoyment of the game.

Five basic propositions of naval combat

In his definitive study of naval tactics, Capt. Wayne Hughes defined five propositions, each based on a process[1]

- Naval warfare centers on the process of attrition. Attrition occurs through the successful deli very of firepower.

- Scouting, locating the enemy task force and tracking it until firepower is delivered, is a critical tactical process.

- Command and control, C2, is the process of transforming scouting and firepower potential into effective delivered force.

- Naval warfare is a'force on force' process. Given equal scouting and firepower, the potential exists for the simultaneous destruction of both sides. To be the victor, you must attack effectively first.

- Maneuver is the tactical process by which C2 positions scouting and firepower forces.

Practical lessons

First, be the first to attack. When you attack, attack with everything you've got Don't keep half your bombers warmed up on deck—they're just going to burn when your enemy makes his counter attack.

Play testing experience has shown that when two powerful Task Forces meet, the first to deliver an effective attack is usually the winner. Unless the target launches a counter-strike before yours arrives, much of his firepower will be destroyed by your attack and his ability to launch a counter attack will be eliminated.

After launching an attack, position your task force where it is safest. If there's a storm nearby, duck into it to minimize the chance of a counter-strike finding you. But be sure to keep close enough to recover your bombers. Not only do you lose points for bombers that crash, but you virtually eliminate the possibility of a follow-up strike if your bombers don't make it back.

Protect your task forces! A large task force is easy to lose and difficult to replace. Think of a portion of your scouting power as part of your defense. Use it to 'sanitize' an area before moving your task force through it An unexpected attack from a completely undetected task force is a commander's nightmare.

'• Hughes, Wayne P. Fleet Tactics. Annapolis, Maryland: U.S. Naval Institute, 1986. pp. 145-146.

6.2 How to attack neutral planets

A common mistake is to always attack with overwhelming force. Usually a 1:1 attack is the best splitting your forces will allow you to attack more NPs in a shorter period of time, but will expose your weakened TFs to stronger enemy forces.

How many marines are enough?

First let's look at how marine combat is resolved. The probability of a marine attack succeeding is:

$$\text{prob} = \frac{100 \bullet \text{number of marines landed}}{\text{marines landed} + \text{strength of planet}}$$

Example: if you land 30 marines on a 30 point planet, the probability of success is:

$$100\text{-}30/(30+30) = 50\%$$

With a probability of 50%, you would expect to win one out of every two attacks. In other words, on average, it will take two turns to conquer each planet you attack at 1:1 odds.

If you attacked with 10 marines, the probability of success would be $100 \bullet 10 / (10 + 30) = 25\%$. With these odds, you'd expect to win one out of four attacks, so it will take twice as long, or four turns, to conquer each planet

What happens if you attack with more than 1:1 odds? If you attack at 3:1, for example, the probability of success is:

$$100\text{-}90/(90+30) = 75\%$$

In this case, the expectation is that it will take less than 2 turns, but still more than 1 turn to conquer a planet. In fact, you'd have to attack with an infinite number of marines each turn to increase your rate of conquest to one per turn.

Splitting your forces

A better way to increase your rate of conquest is by splitting your forces and attacking two planets simultaneously. If you make two 1:1 attacks each turn, you would expect to win one of them.

Obviously, the more task forces you have making attacks, the better, in terms of rate of conquest. Unfortunately, you have a limited number of production points to work with. Each task force requires an 'over head' of production points for staying power and defense power. The more you split your forces, the weaker and the more vulnerable each TF will be. You must assess the strategic situation and make a decision based on the risks and rewards.

6.3 Three suggested strategies

Any valid strategy must focus on the need to capture and control neutral planets. Victory in naval battles must be considered secondary and subservient to this goal.

The primary importance of Neutral Planets

In developing a strategy, you must acknowledge that neutral planets are the key to winning 'Worlds at War'. While it's possible to net one or two hundred points through a dramatic naval engagement, a single 30 point neutral planet will generate that many points every five or six turns. Your object must be to capture and control as many NP points as possible, and to deny the same to your opponent.

One step at a time

The most obvious strategy is to simply capture the neutral planets which are closest to your bake planet Your base planet can often provide bomber and missile cover for one or two marine convoy TFs which concentrate on capturing as many NP points as possible

Meanwhile, you can be building up a powerful TF which will be able to extend your reach to the more distant NP. It's a safe, conservative strategy which has often been successful.

Bypass and blockade

This strategy focuses on denying the opponent an opportunity to capture NPs nearby his own base planet It requires that you invest most of your initial production on a single large TF which penetrates into enemy territory for the purpose of destroying or at least harassing the enemy forces.

Meanwhile, behind this forward defense, small, practically undefended marine TFs can be capturing as many NPs as possible.

This is a risky strategy. Your forward TF will be under constant threat of annihilation. However, it can be very successful if pursued prudently, especially if the hidden movement option is used and the forward TF is able to use poor visibility areas as cover.

Going for the jugular

This strategy is based on scoring a knockout blow against the enemy base planet This will always result in a victory, if you can do it. Unfortunately, it's very difficult to destroy a base planet, especially with bombers. To be successful with this strategy requires moving a heavily defended, battleship style TF, equipped with lots of short ranged guns which can pound away at the planet turn after turn.

This is the most risky strategy, since your TF will probably be wiped out before it ever gets to the base planet—but what the heck, it's only a game.

The best strategy

You'll have to find that for yourself. Frankly, there are so many different ways to play the game, we haven't explored most of them ourselves. The basic key, again, is NP points. Use your naval forces to defend your marines, and to sink your opponent's convoys.

6.4 Developing a scouting plan

Your scouting plan will be based on the tactical situation — but you should have a plan!

The scouting options

Scouting adds an additional dimension to 'Worlds at War'. If you are a new player, you've probably played your first few games without scouting — with all pieces and neutral planets showing on the map.

There are two scouting options (set through the configuration screen):

Show Neutral Planets

Show Enemy Pieces

If you set either of these options to 'N' then you will need scouts and a scouting plan.

Using Auto Scouting

Auto Scouting lets you enjoy the interesting complications of hidden movement without having to suffer the tedium of moving many individual scouts.

Simply build as many scouts as you can afford or have room for. (Remember that the number of scouts plus the number of fighters on any TF or planet must be less than the platform's Staying Power.) You can still launch a few scouts to shadow a TF or stake out a choke point, but the computer will use any unused scouts to conduct a general search for you!

For example, you might build a large TF with 80 Staying Power. On its flight deck, you build 20 scouts and 60 fighters. You launch two scouts to check out a neutral planet which you think is under attack by enemy marines. These two scouts you will need to move manually during the Scout Movement Phase.

The other scouts are left unlaunched. These the computer will move for you, in a radial search pattern around your TF. In general, the closer the enemy unit, the better the chance it will be detected. Again, the better the visibility, the better the chance of detection, just as common sense would indicate.

As a final suggestion, consider building a light TF which only carries scouts. This TF can move to a strategic position on the board while hiding in the worst visibility areas it can find. This dedicated scout carrier can do a really effective scouting job while leaving the decks of more powerful TFs clear for fighters.

Finding Task Forces

It's critical to locate and 'shadow' each of the enemies task forces. It's usually not difficult to find them, they will typically give themselves away when attacking a neutral planet. (A good reason to create separate task forces for your marines!) Once you've found a TF, task two scouts to the job of shadowing it Don't forget to relieve the scouts before they run out of endurance factors!

You should use one or two scouts to find the enemies base planet, as soon as possible. You can then station scouts around the base, ready to follow any task forces that set off from the base planet

Try to shadow the TF from one area away. Moving your scout into the TF's area is a good way to lose the scout. Occasionally you'll blunder into the TF's area, anyway. That's why you should always have two scouts available, just in case you lose one.

6. Notes on basic game strategy

6.5 Massing vs. dispersion

How many task forces should you build? The answer depends on the size of the map, whether you are using hidden movement options, the number of production points available, and your overall strategy.

How many task forces?

This is a tough question, and one which often determines success or failure. To answer it, you'll need to weigh several factors. Some of them are:

The map size

The larger the map, the more task forces you will need. It's simply impossible for one TF to cover a 50 x 50 map. A corollary to Murphy's law states that your TF will always be in the wrong place.

Hidden movement

As a general rule, when using the hidden movement option, disperse your forces by building more, smaller task forces. When not using hidden movement, mass your defenses by building fewer, more powerful task forces.

The rational for this rule is simple: With hidden movement, your opponent will have to locate and track your TF before attacking it It's simply more difficult to find 5 TFs than it is to find 1 TF.

On the other hand, without hidden movement, the where-abouts of your forces are always known. You can't depend on stealth for defense, you must mass for defense. That means building survivability into the TF with lots of Staying Power and Defense Power.

General strategy

This will evolve from the placement of Neutral planets. If you arc lucky enough to have three or four high value NPs within bomber range of your base planet, you may elect to base all of your bomber and missile power on your base planet, and send a couple of lightly defended marine convoys out to capture the NPs.

If you are unlucky and all the NPs are in enemy territory, you're going to need a powerful strike force to claim some points for yourself.

Will you economize and combine Naval and Marine missions in the same TF? Or does it make more sense to separate the jobs, using a lightly defended marine convoy screened by a powerful covering force?

Are you using the Night Moves option? Then you'll want to have a separate battleship style TF for 'night surface actions'.

Coordinating attacks

When you build a single TF, with say, 80 bomber strike points, it's a simple matter to launch a massive, coordinated strike against an enemy TF. Just launch all 80 bombers as a single formation.

If you disperse your forces, by building two or more TFs, splitting the bombers between the TFs, you should still maneuver your TFs in such a way that it is possible to launch a coordinated strike against a powerful enemy TF.

As explained earlier, a 40 point attack against a 70 point defense, will do more damage to your bombers than to the TF. If, however, you can coordinate two strikes of 40 bombers each, you can do considerable damage — provided that the formations strike at the same time — a risk you'll have to live with.