

PHOENIX

Beyond the Stellar Empire

Combat Manual

v1.0

Space Combat

Introduction

Conflict is an important part of Phoenix: Beyond the Stellar Empire. Battles can occur anywhere, from the cold wastes of space on the edge of a remote star system, to right in the heart of an empire, around the capital starbase. It is generally the location that determines the types of positions that become involved in the battle. Platforms are always controlled by starbases and outposts so protect worlds, while ships are used to mount attacks in enemy space or patrol home territories. Ground parties, while capable of using weaponry designed for space combat, have very little defence so should avoid it if possible. There is an entire branch of combat designed around close combat (i.e. generally fought on the ground.)

All combat, whether it is in the depths of space or conducted on the ground occurs simultaneously. This means that while ships may be engaging each other over a planet, ground parties may be invading starbases or outposts on the ground, attempting to wrest control from the enemy.

Due to the differences between ground combat and space combat, they are dealt with separately in this document, even though they will be occurring at the same time in the game. Where there are differences in how the combat program treats position types, they also will be given their own section.

One final point, this document is designed to give an insight into how the combat system operates, it does not give the definitive method of designing ships or the strategies and tactics required to run a successful military campaign. Simply put, throwing everything you own into combat on the opening day does not guarantee victory. The biggest ships are not always the best option and it is not always about delivering the most damage.

Like every aspect of Phoenix: Beyond the Stellar Empire, knowledge is everything. Knowing the vulnerabilities of the enemy and the tactics they use is the key in deciding the methodology for their defeat.

Triggering Battles

Conflict can be triggered by any action that results in the flagging of a position as an enemy target. Entering orbit of a hostile starbase is one example, moving a patrol fleet into a location containing an enemy spaceship is another.

The procedure is straightforward to determine if a battle is to take place. First there is a scan to determine if a position has been detected, then there is an enemy list check. This is a two-way check so that the aggressor must detect the potential target. A stealthy position may scan ships that would attack it, but a battle would not be triggered unless they in turn successfully scan the stealthy position.

Fixed Facility Triggers

As changing standing orders does not necessarily cause an enemy list check, some position types have the 'Trigger Battle' order. This will immediately run list checks against all scanned positions to determine whether a battle should be triggered. Orders can be specifically given to attack a specified position although these will obviously only work if the target is in striking distance.

Breakdown of Combat

Combat occurs at the end of each day's turn run, after all turns have been completed for the day. Combat is broken down into 4 rounds. This is to allow for a more detailed account of actions within combat.

Each position has parameters that can be defined by the player, detailing the preferred actions to take during combat. These include flee parameters, preferred targeting instructions and even who to attack.

Combat will continue as long as there are active participants and can span days or even weeks. Each day however only has four rounds of combat. All the parameters at the end of the day are stored so that the next day combat effectively carries on from where it left off. Ships that attacked a specific position will continue to do so on the next day and the day after until they have been destroyed, destroyed the target or an order to stop targeting the specific enemy is received.

While combat may continue from day to day, other positions can become involved simply by arriving at the scene of the battle. Further, if a position is capable of leaving, it can do so if the owner orders such a move.

A battle may therefore last indefinitely, spanning weeks or even months (although it is very doubtful that any position present at the beginning will still be there at the end).

Change in circumstances

Combat will only be checked as a result of an action. This means that unless a position performs an activity, there will be no combat checks. Two positions may be in the same location and not hostile to each other. Sometime in the future there may be a political shift such that both parties become hostile. They will not immediately engage until one of the positions performs an action, or a third party enters the scene and triggers a battle.

Triggering

A position will attempt to run all orders in a turn until it either completes them or runs out of TU's. After each order there is an enemy list check. This will flag positive for a potential battle. If flagged there will then be speed checks so that positions attempting to flee will do so before combat and thereby prevent a battle from occurring. In this case, the turn will continue.

Lists

There are four lists, enemy, support, defend and ground. Each is designed to fulfil a specific role and use of these will determine if a position becomes involved in combat. Each list can have positions or groups of positions added to it:-

Individual positions

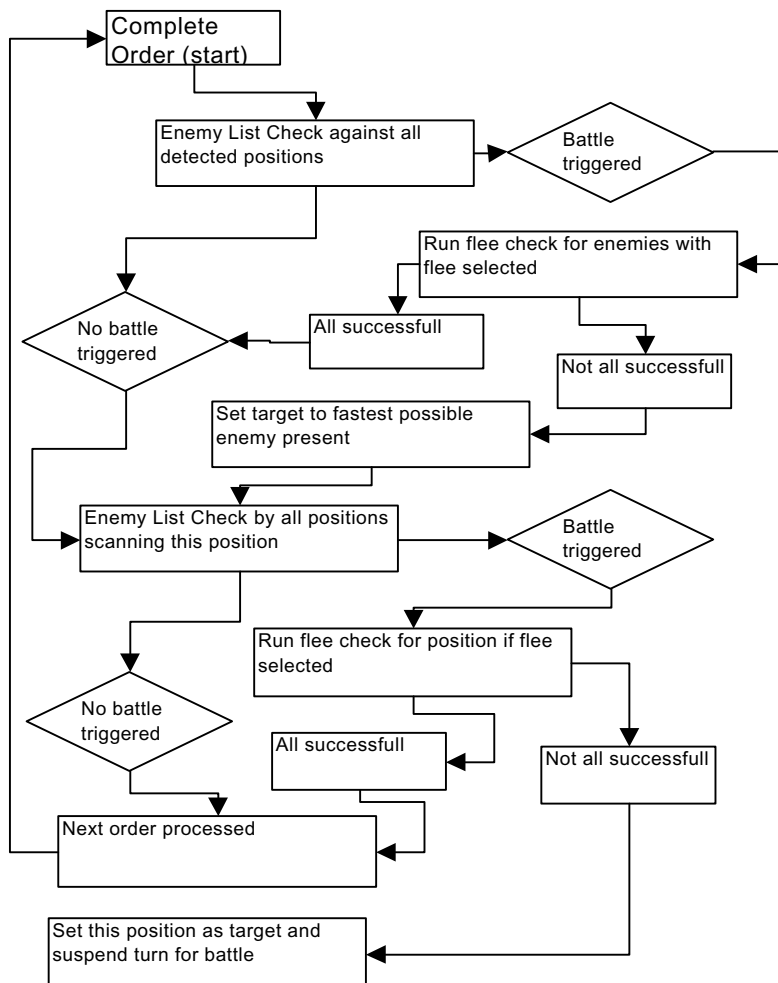
Entire Affiliations

Affiliation Posted Lists

Pirates

Enemy List

The only way to trigger a battle is to have an active enemy list. This is a list of enemies who will be attacked immediately if detected. There are restrictions as to what can be added to an enemy list; these restrictions are dealt with in the order utility and affiliation rulebook. The flowchart below shows how enemy checks are processed at the end of every order. Basically these checks determine if the turn is suspended for a battle to be run at the end of the day.



Combat Avoidance

Only successful enemy checks followed by unsuccessful flee checks cause the suspension of a turn. As such, having a very low sensor profile may mean that a position is not scanned in the first place so that no enemy check is run. Also having a very fast combat speed will often allow a ship to escape combat before it occurs.

Combat Assurance

The best way to ensure combat is to have a very high sensor power and a very fast combat speed. The role of a specialised ship may be solely to prevent the target from getting away before combat starts.

Flee Checks

A position will attempt to flee combat if it has elected to do so, or if it is incapable of combat. In order to flee the position needs to be capable of escaping. A position is only capable of fleeing if it has a positive combat speed and is not pinned.

Combat Speed

ISR drives use field theory and as such cannot be used when the ship is manoeuvring. This means that ships require a secondary form of movement to operate in space battles; this is the combat speed of the ship and is given by various thruster types. ISR and jump drives cannot be used to escape from combat and if a ship is in orbit, manoeuvre speed cannot be used to land. A ship has to first successfully leave combat before initiating any other action.

Thrust types

Combat requires swift changes of direction, rapid bursts of acceleration and powerful impulses to give the required changes of momentum. For this short hot bursts from reaction drives are required. Manoeuvring on the other hand is a series of regulated bursts, most of these resulting in predictable changes of momentum in order to put the least strain on the hull of the ship. In Phoenix: beyond the Stellar Empire, there three different engines representing these two forms of thrust. Standard thrust engines provide both combat thrust and manoeuvring thrust. Combat engines cannot maintain long bursts and have thrusts placed across the entire surface of the ship, allowing it to change face and accelerate in any direction. The third type is landing engines. These have a few auxiliary thrusters but the main thrusters are set in one location allowing for slow sustained manoeuvring. In combat only factors for combat engines and standard thrust engines are used to determine combat speed. It is not about moving fast but being out of direct line of sensor and weapon sight long enough to produce an ISR field or plot a course down onto the surface of a world.

These checks are just for opening battles. Once a battle is happening in a location then all participants in the battle will be visible to any position entering the location on subsequent days until the battle is over, thus allowing new arrivals to join in if their lists are triggered by the participants.

Support List

A support list is triggered in the opening round of combat. Should a position that is being supported initiate an attack, all positions that support the attacker will immediately use the enemy list of the position they are supporting in order to designate a target to attack. **This means that adding another position to your support list gives them some measure of control over your position.** Adding an entire affiliation to your support list should only be done under specific circumstances. Warships and such generally move around in squadrons lead by an admiral. It is therefore customary to have only the admiral's ship on the support list.

Defend List

The defend list is not triggered in the opening round of combat as it is a reactive list. At the end of any round of combat during which a position on a defend list was attacked, the defending position will then target the attacker.

On Patrol

Normally only successful enemy list checks will lead to the suspension of a turn in order to run a battle. This however could lead to a fleet of ships being separated. For example a pirate may only have a freighter on their enemy list. When the freighter and its escorts pass through the pirate's location, the freighter would be stopped for combat and the rest of the convoy would carry on their movement unless they carried pirates on their enemy lists. Obviously this would defeat the purpose of having escorts.

Setting the 'On Patrol' flag means that the ship will carry out all checks at the end of each order. This means that they will stop for any combat in which a position they are defending has been successfully targeted or a position they are supporting has locked onto another position.

This circumvents the normal first round reaction for a position's defend list. Using this option however can have drawbacks. If the objective is some distance away, defenders can leave potential targets in the intervening space. This may prevent the fleet reaching their objective immediately as each day their turns are suspended while they deal with each target.

Changing Lists

Once combat has started, enemy lists will change as a course of combat. This is because defend and support lists work by actually adding positions to the enemy list so that future enemy list checks will indicate the difference. So supporting in an attack will result in the addition of a position to the enemy list at the initiation of combat. Defending a position will result in the addition to the enemy list of any position attacking it. If a position attacks a target and the target is not attempting to flee, the target will add the attacker to their enemy list. This will mean that on the next round of combat they will open fire on the aggressor, if they are not currently engaged elsewhere.

Pinning

A position is pinned (i.e. locked in combat) if a ship with a superior combat speed is targeting it. Tractor beams fired at a position will increase the mass of the target for the purposes of combat speed calculations. This in effect reduces the combat speed of the target. They can therefore be used both offensively and defensively.

Offensively they will reduce the speed of the target, thus preventing it from escaping combat. Defensively they will be fired at attackers reducing their combat speed. This may be sufficient to allow the fleeing ship to escape. As each tractor beam increases the mass of the target by a specified amount, they are more effective against smaller ships.

Pinned positions cannot perform any action other than changing standing orders. In addition, pinned positions cannot normally receive any deliveries. Starbases and outposts can interact with positions in the starport however, and receive items from teleporter complexes - but not shuttle ports.

Dump Cargo

This option throws out all non-living equipment from the back of the ship at an accelerated velocity, in order to propel the ship forwards. This effectively increases the combat speed of the ship but sacrifices the cargo to do so.

Sticky Situation

*As all positions other than ships have free use of lists, including enemy lists, very dangerous and chaotic situations can occur in a combat. All it takes is a large faction to have an entire affiliation on their support and defend lists and a single attack can lead to all kinds of mayhem. A position is therefore encouraged to use lists with the utmost caution. Further complications to this will occur when changing enemy lists during combat. **In the situation where a position has allies on both sides of a combat, virtually anyone could end up being added to enemy lists.***

Random Targets

It is often the case that the fastest target is not the first choice of a captain with hindsight. As such, careful use of the lists will ensure that only a few positions will be designated as potential targets. Further, once combat has begun targets can be changed by alteration of the enemy lists so that only the desired target remains on the enemy list.

Designating a target

The choice of target is not random. In fact where a position is not pinned it will check its entire enemy list, including those positions that have been added, on account of changing lists in order to locate the fastest possible ship that can be pinned for combat. If the position is pinned, it will attack positions which are pinning it before any others.

Space Combat

Damage is the primary concern in combat. Suffer too much in combat and a position will be destroyed. Doing everything possible to minimise damage suffered may well reduce a position's ability to damage enemies, thereby prolonging combat and possibly ending up with the same result. It is therefore imperative to strike a balance for how a position copes with delivering and receiving damage.

Offence

This is basically a list of weapons to be included in the position. There are many to choose from, and for the most part the nature of the weapons chosen reflect the role the position will play. Smaller weapons are generally ineffective against heavy armour, while highly penetrating weaponry may not inflict enough damage to the whole target. All weaponry also has a number of advantages and disadvantages associated with its type. A short commentary follows for each weapon type.

Weapon Types

Beam Weapon

These fire a blast of energy with precision accuracy at the target. Their primary advantage is that they are completely self-contained and do not require the use of ammunition. Their primary drawback is that both planetary atmospheres and the effects of scintillator fields attenuate them.

Launchers

There are two types of launchers – for missiles and torpedoes. They behave in largely the same manner, as both are small devices that launch their ammunition, which then homes in on the target and explodes. The primary advantage with these weapons is that they inflict large amounts of damage and are not affected by scintillator fields or planetary atmospheres. Their primary drawback is that they require ammunition, which is both bulky and prone to explode if hit. Point defence also shoots them down.

Combat Efficiency

In battles the effectiveness of weapons and non-automated defences (i.e. not scintillators, shields or armour) is based on the efficiency of the position. The efficiency of the position is in turn based on the quantity of crew factors provided by the troops and the requirement of the items to be used in combat.

This combat efficiency is applied to all aspects of combat such as targeting, firing weaponry and controlling territory in ground combat.

Efficiency effected areas

- [1] Weapon accuracy bonus*
- [2] Targeting computers and sensors*
- [3] Shield recharge rate*
- [4] Point defence Accuracy*
- [5] Dodge for ships.*

If ground combat is occurring at the same time then all the factors required for ground engagements are also added to the list.

Starbases and outposts have an advantage in that they can build complexes called security complexes. These monitor all aspects of both space and ground combat and as such improve the ratio of crew factors provided by troops to the quantity required for use of ordnance.

Weapon Damage to Mass Ratio

There are multiple weapons of each type each with a different mass, e.g. Light Photon Gun, Photon Gun, Photon Cannon, Photon Battery and Heavy Photon Battery are all types of photon gun, a relatively common beam weapon. These represent increasingly larger versions of the same weapon class.

While in all cases the damage delivered by the weapons will increase with increasing mass, the damage to mass ratio will decrease, i.e. 1 heavy Photon Battery has the same mass as 400 Light Photon Guns. A heavy Photon Battery will deliver 1200 damage per hit. 400 Light Photon Guns will each deliver 25 damage for a grand total of 10000 damage. This is more than 8 times as much damage for the same mass of weaponry. As damage suffered is dependent on the damage inflicted per hit, it can mean that armour, shields and scintillators (see next section) may absorb many low damaging hits without the ship itself being harmed.

Rail Weapons

These use linear accelerators to project a small mass at a target. This mass is generally an explosive charge of some description. The advantage of these weapons is that they fire masses at extremely fast velocities so that some of the damage is kinetic. This makes them efficient and simple to build, as the ammunition is relatively small compared to the mass of the weapon. Their primary drawback is that despite the speed at which the ammo is launched, it is still relatively slow when distances in space are considered. As such they are notoriously inaccurate. As the ammunition is generally not a single mass by the time it impacts on its designated target, point defence is ineffective against them.

Space Fighters

These are launched from fighter bays. They are launched at the start of each day and have to return at the end of each day for refuelling and ammo replacement. This means that they only take part during the middle two rounds of daily combat. Their advantage is that they are the most accurate type of weapon and as such are most suited to targeting a specific item category such as life forms or weapons. Their primary drawbacks (beyond their limited daily combat use) are that they are expensive to build and can be destroyed by point defence or interceptors.

Tractor Beams

These generally do not damage the targets they fire against (although some specific weapons that make use of tractor technology may do so). They are primarily used offensively to reduce the combat speed of the target. This will in turn reduce the target's dodge bonus. Their primary disadvantage is that they are not much use without other supporting weaponry.

Weapon Statistics

Accuracy

Each weapon, launcher or even ammo has an accuracy bonus that is applied to the total accuracy and therefore affects the chance of hitting a target. In the case of ammunition-based weaponry, this is the combination of the individual values for both the ammo and the launcher, although in most cases one will be zero.

Damage

Each offensive weapon has a damage value. This is the amount of damage that a successful hit will deliver, generally based on the size of the weapon. Larger weapons of the same type will as a general rule deliver more damage, although the damage to mass ratio will be lower - a weapon ten times as large will not deliver ten times as much damage. Due to penetration of the tiers of defence (see later), larger weapons may well prove superior in combat, especially against heavily armoured and shielded targets.

Armour Factor

Needle beams and armour piercing mechanisms rely on the basis that their damage is applied to a very small area. As such the overall defence is much lower. The drawback with this is that there is only so much damage that can be applied to a vastly reduced area. As a consequence, the damage inflicted by highly penetrating weaponry is generally much lower than the more conventional varieties of the same weapon. The armour factor is the multiplier to any tier of defence that affects the attack. This means that highly penetrating weaponry often has a low armour factor.

Certain weapons are designed to damage shields or burn off armour. These have armour factors greater than 1, i.e. they actually multiply up the defence of a tier. They work by imparting more damage into each tier of defence. Proximity warheads for example, are missiles that deliver a huge amount of damage but have high armour factors. They will be absorbed by shields and swiftly reduce the factors remaining. If fired early in a round, they could take out shields before the generators were able to replenish them. This could give enough time for other weaponry to get through with sufficient force to break through the target's armour threshold. As a further note, using this type of carpet-bombing on a starbase or outpost could be brutal due to the target's lack of armour.

Blast Radius

Normally all damage from one hit will strike one item. Which item is hit is determined by comparing the size of each item with the total size of a position. Therefore having a lot of an items of a specific type, or having items with large surface areas will mean that they are more likely to be hit by incoming damage. If the damage applied to the item is lower than the defence of the item, it has a chance of being destroyed percentage of damage received – if more damage is applied to the item than it's defence value it is automatically destroyed. Should excess damage exist, the remaining damage is treated as **splash damage**.

To calculate how much damage is carried over and used to damage other items, the excess is multiplied by the blast radius and this number is then multiplied by a value derived from the spread of the target. A ship is always considered to be packed, i.e. within a small volume, while a ground party may be distributed over a varying area and can have any spread from packed through to disperse (Note, each spread description covers a range of values). This damage is then applied to other items. This may in turn also result in overkill and result in further carryover splash damage until there is no damage remaining from the hit.

Highly penetrating weaponry generally has a low blast radius. The theory being that they focus their blast on a very small area. Exceptions to this general rule exist but they are unusual or restricted technology.

Defence

Without any form of defence a position will be destroyed very quickly. It is therefore imperative that some measure of defensive capability is accommodated in any position. Ships and platforms have their hulls as the last line of defence. Other positions however are not so fortunate. They have to rely on other factors.

Armour

Ships, as well as having their hulls to soak up damage can also prevent damage penetrating through the hull by incorporating armour in their construction. The amount of armour that can be fitted to a ship is based on the type of hull used in construction. The thickness of the armour is then dependent on the armour used and the amount used.

Hull Type	Maximum Armour thickness		
	Ablative	Normal	Light
Heavy	120	80	60
Normal	60	40	30
Light	15	10	7.5
Xtra Light	7.5	5	3.75

Ablative armour

This is built from material that quickly decays when damaged. This swiftly absorbs energy that would normally be transferred through to the contents of the position, thus providing a thick line of defence. The primary drawback with this is that the absorption of the energy destroys the armour. So while it may be excellent to begin with, in a prolonged battle the protection offered by the armour will drop rapidly. Use this armour type for positions that do not expect to be in combat for long!

Armour Plate

The standard warship armour is armour plate. This is tough stuff and while it is not as thick as ablative armour, it will last much longer. This makes it suitable for long drawn-out conflicts.

Light Armour Plate

Note: While this is in fact a restricted item, requiring research before it can be produced, it is mentioned here for completeness.

The advantage of this armour is that while it is thin, it is very light. As the combat speed of a ship is based on the total mass of the ship and the quantity of engines supplying combat thrust factors, a ship with this armour type can have a much higher combat speed. The advantages of this are many. Primarily it means that attacks will have a lower chance of hitting and in the case of inaccurate weapons such as rail guns, this can be considerable. The second advantage is that having high combat speeds allows a ship to pin other targets rather than become locked themselves. This may mean the difference between being locked in combat until destruction, or getting away for repairs long before this occurs. The

Damage

Weapons always deliver their damage value when they successfully hit a target. The value for all defensive mechanisms is shown as the maximum defence possible. In reality however they will only give protection of about half of their stated value on average.

Armour – Armour thickness is the maximum damage that can be absorbed from one hit, e.g. an armour thickness of 60 will mean that on average the damage inflicted by an attack will be reduced by 30. This applies to all attacks however - a volley of 100 hits, each delivering 35 damage will actually result in an average of 500 damage penetrating the armour even though 3500 damage was delivered. A single hit of 1000 damage however will result in approximately 930 damage penetrating the armour. This same mechanism is applied to scintillator coverage and shield depth.

Defence Tiers

All attacks are subject to a tiered system of defence. Only attacks that penetrate all lines of defence will actually damage the position. This damage may be suffered by any items listed as part of the position although splash damage can also be applied to docked positions. If at any time the attack is fully countered, such as point defence shooting down a missile, the combat program will stop and move on to the next attack. Only the damage penetrating each tier is used for subsequent checks. This means that in certain cases a hit may not even cause damage. If a tier is not present – or not applicable for the type of weaponry used - it is ignored and the next tier is checked

The defensive tiers (in order of use) are:

- 1. Gatling lasers will blast any missiles, torpedoes and attacking space fighters.*
- 2. Interceptors will engage attacking space fighters and bombers.*
- 3. Phalanx launchers will fire phalanx missiles at any torpedo, missile, space fighter or space bomber that is still attacking*
- 4. Scintillators will attenuate any beam weapon, reducing the damage of each hit by up to their coverage, multiplied by the armour factor of the beam weapon.*
- 5. Shields will reduce any damage by up to their shield depth, multiplied by the armour factor of the weapon/ammo hitting. The damage absorbed will directly reduce the shield factors on a one-to-one basis.*
- 6. Armour will reduce any damage by up to their armour value, multiplied by the armour factor of the attack. This damage has a chance of destroying some of the armour.*

primary disadvantage is that the armour is not very thick so high accuracy weapons can be quite lethal to ships with this type of armour.

Other Armours

Other armours exist although these are not primarily designed for combat. Korondite armour and its ilk offer only marginal defence and are easily destroyed. They should not be seriously used as a combat aid – except for avoiding combat in the first place!

Shields

Shields are based on field theory and utilize regions of varying potential with fluctuating nodal points and artificial van Allan belts. These field lines channel energy in the same way that the magnetic field of the Earth channels dangerous stellar winds away from the surface. Once charged to maximum they slowly and naturally deplete although this is by a very small amount and is accounted for in the construction of shields. This allows the position to perform normal operations such as docking and making transactions without worry.

The only drawback is that when channeling large amounts of energy in a very short time – such as within combat the field is depleted much more rapidly than in normal operations. In these circumstances the shield unit cannot recharge the field. In order to have the field restored to full strength the ship needs to visit a maintenance complex, or install devices specifically designed to perform this operation.

A shield has three values; maximum factors, current factors and depth.

Maximum Factors

This is the value of the combined shields when fully charged. This is measured in factors. Each factor represents the ability to absorb 1 damage, i.e. a shield with a maximum of 400 factors can absorb 400 damage before being depleted.

Current Factors

This is how many factors are present. If there is a drop in the quantity of installed shields, then this number will drop only if the new maximum factors are less than the current factors. This presumes that as large a field as possible will be maintained, allowing for the best shield possible. If there is an increase in the number of shields installed, the current factors will not increase. It is presumed that new shields are installed uncharged. If a ship undertakes a maintenance visit the shield factors will be automatically recharged to maximum. Ground parties cannot do this so must use shield generators (see below).

Shield Depth

The ability to prevent damage is a function of the shield depth. The depth is determined by the number of shield factors in the shielding field and the surface area covered by a shield. The surface area is itself dependent on position's total size modified by its spread. As a consequence, a dispersed position with the same number of factors as a packed position will have a much lower shield depth. In the case of ships, those built from heavier hulls are more compact. This means that even if they have the same number of hulls they will have smaller surface areas than ships constructed from the lighter hull types. As a consequence they will have greater shield depths for the same number of factors. This though is

Any remaining damage is then distributed into the total contents of the position. What is actually hit is based on the ratio of total surface area of a specific item against the total surface area of the targeted position. This chance is modified by any targeting preference specified by the attacking position. If an item takes sufficient damage, it will be destroyed.

*The chance of destroying an item is based on the defence of an item compared to the damage taken, i.e. if an item has a defence of 10 and receives 5 damage, there is a 50% chance it will be destroyed. Excess damage from a hit may 'splash' onto other items. This is based on the **blast radius** value of the weapon/ammo doing the damage, and the **spread** of the target. Weapons and ammo that are designed to explode and cover a large area generally have a blast radius value close to 1. Should they hit a packed target, then virtually all damage penetrating through the tiers of defence will count.*

Spread

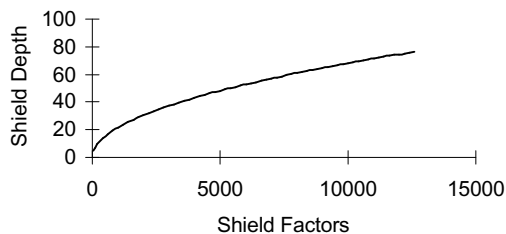
*How much surface area is taken up by a position is dependent on two factors, the size of the position and how it is laid out. In the case of ships and platforms, everything is contained within a shell formed by the hull, however ground parties and installations such as starbases and outposts can cover a varying surface area depending on their design. How packed or dispersed a position is, is called the **spread** of the position.*

*There are five levels of spread.
Packed; Close; Normal; Open; Dispersed*

All ships and platforms are classed as packed. Starbases and outposts can change their spread, but will only tend towards this target spread with the construction of new complexes. Ground parties can change their spread immediately.

countered by the extra internal capacity of the lighter ships, i.e. the ability to carry more shields in the first place.

The last function contributing to shield depth is based on field theory itself. There is field strength fall off with increasing factors. As a consequence, doubling the shield factors will not double the shield depth. This relationship can be represented in graphical form.



The shield depth measures the maximum amount of damage that can be absorbed from a single hit suffered during combat. As this is the maximum damage that can be absorbed, it is more likely that only half the shield depth will be effective, i.e. a shield depth of 30 will absorb on average 15 damage per hit.

Each hit is treated individually. So by this, presuming there are enough shield factors, a shield is more likely to stop many hits, each of a small amount of damage than a single hit of a large amount of damage.

Shield Generators

In order to recharge rapid depletion, a ship can install shield generators. These have a recharge value. The total recharge value for all the generators will be added to the shield factors at the start of each round of combat. During the course of the round of combat however there may well be a drop in the total shield factors, which will result in a drop in shield depth. As there are 4 rounds of combat in every day, during a day where there is no combat, shields will generate 4 times their recharge value in shield factors.

NB. Shield generators will never recharge shields beyond their maximum shield factors. Excess shield generators will be ignored. A ship designer should consider carefully the balance between shields and shield generators to best suit the ship's intended role.

Scintillators

Scintillators use a similar set of principles as shields, although they do not attempt to absorb energy. As such they are never depleted. Once installed they work by sustaining highly reflective material in a stationary field around the position. This works to disperse electromagnetic energy - such as that used by beam weapons as it passes through the suspension. As the field can be manipulated from within the position, there is no attenuation of outward firing beam weapons or gatling lasers.

The coverage given by the dispersion field is calculated using the same parameters as shield depth. The dispersion field works in the same manner as shield depth, i.e. the coverage is the maximum damage absorbed per beam weapon hit. The average damage absorbed will be approximately half the coverage value.

Items Designed for Combat

Many items come in two forms; those designed for civilian use and those for naval use.

Civilian items are invariably constructed with cost being the primary constraint. They are built specifically to perform their intended task with little or no consideration of how they will perform in combat situations.

Items designed for use while in combat are generally as efficient as civilian versions but tend to be much more robust and/or are more compact.

The extra resilience of items designed for combat is generally imparted through the use of thorlium during production. This mineral is almost as strong as diamond, but much less brittle so it allows the items to suffer much more damage relative to their size before being destroyed.

The other way of protecting the items is to make them more compact. Thus certain military items have much smaller effective surface areas, so there is less chance of them being hit during combat.

Some examples of military items:

Bunks

Bunks perform the same role as quarters but are more efficient on account of being smaller due to their austerity.

Battle Bridge

These are exactly the same as normal bridges although many of the cheap and cheerful electronic components used in civilian bridges have been replaced with hardened varieties.

It is clear that a respectable scintillator coverage will counter virtually all attacks made by weak beam weapons such as light photon guns.

Point Defense

Point defense is weaponry designed solely for the purpose of countering enemy attacks. It can never be used offensively. There are two types, beam weapons and rockets. Rockets are much more effective than beam weapons but use ammunition. Both shoot down missiles, torpedoes, space fighters and space bombers that are on attack vectors towards the position.

Beam Weapons

The standard point defense beam weapon is the gatling laser. They form the first line of defense against designated attacks, as they do not use ammunition. They only deliver a small amount of damage so are only particularly effective against missiles (and to a certain extent torpedoes). Each beam weapon has a designated number of shots although these will be used sequentially in order to counter attacks. This means that multiple shots will only be used against an attack if preceding ones fail. This makes even a few gatling lasers very effective against missile attacks.

Rockets

The standard point defense rocket is the phalanx missile and its launcher. This is used only after the exhaustion of gatling lasers on account of its use of ammunition. They have a much greater accuracy than beam weapons, as they have their own tracking systems and do not rely on line of sight. They also deliver a superior amount of damage making them effective even against larger targets such as space fighters and bombers.

Interceptors

These are similar to space fighters in that they are launched from fighter bays. The only difference is that their task is to engage enemy space fighters and space bombers. Unlike normal defensive measures, interceptors will attempt to engage all enemy space fighters and bombers. This means that they can be used to cover friendly ships being attacked by enemy space fighters.

Ground Battle

This is still being finalised at time of printing and can be downloaded from the website.

Main Topic Cover:

Control

Capture of a position is only possible by achieving 100% control. The position is considered owned by the defender as long as it retains any control. This said, the efficiency of the position is further multiplied by their control, i.e. a position normally running at 60% efficiency for various reasons is subjected to a ground assault. After an intensive conflict, 50% control is lost to the enemy. The effective efficiency of the position is now 30%. Note that control can be regained if the battle swings back towards the defender's favour.

Range

Ground based weapons (as opposed to space based) have ranges. These can be anything from "close assault only" through to "planetary". Where the weapons attack from beyond the sector of the target, normal shields play a role in defence. Only when the attack is from within the location, such as in a starbase or outpost, or during boarding actions, will shields and other forms of defence be rendered useless.

Troop Types

Each troop type is specialised in a specific range of combat, or used for different types of assault. Space troopers for example may form a ground party in orbit and de-orbit under their own power in order to make an attack. Soldiers are good at using long-range weapons to soften up a target before attacking. Marines are best at close assault, such as within a ship or platform.

Boarding

While dangerous, due to the firing of point defence and space weapons at close range, these will allow one position to effectively perform a hostile docking in order to launch a close assault on the target. In the case of two ships they will be considered mutually locked, and attacking one may cause splash damage to the other. They will also be easy targets, due to their lack of combat manoeuvring.

Targeting

Space Combat

There are a number of different weapon types used in space combat. These are all massive weapons generally installed or mounted on large structures. They are capable of firing across vast distances with little or no degradation. Space weaponry carried on a position in orbit can be used to fire at positions on the surface of a world, and vice-versa. Due to planetary locations, positions in orbit cannot fire at positions in the surrounding quadrant, nor can the reverse happen. This keeps it simple, avoiding confusion such as planetary bodies blocking line of sight.

Ground Weaponry

Weapons designed for ground-based combat differ in that they have a maximum range. This is measured in planetary sectors. In order to use these against another position, the position has to be within this distance. Ground-based weaponry in a ground party in orbit can only be used against other positions in orbit if it is boarding a stationary position, or using planetary ranged weapons. This is because orbits are large, so normally only the longest ranged weapons are effective. In space, ground based weapons are effectively useless against anything other than a stationary position.

Targeting

In order to damage another position, a successful hit is required. To hit, each weapon is fired independently. This is simulated using a bell curve based on the sum total of three random numbers between the values of 0 and 5. If the resulting number is below the total accuracy for the weapon, it is deemed to have hit.

Calculating an accuracy score for a weapon is done by totalling the following:

Base Accuracy: This is the accuracy of all positions before any other modifiers are applied, and is always +3

Targeting Computers: This is the bonus from the targeting computers and cannot exceed the position's sensor rating.

Captain Experience: This is +0→+4 based on the experience of the captain involved. It can never be more than the Targeting computer bonus.

Weapon/Ammo Accuracy: This is the accuracy the weapon adds, it also includes any accuracy the ammo might have as well - for instance missiles have an accuracy of 6 but a basic launcher has zero accuracy.

Target Size bonus: This is a bonus based on the size of the target being engaged

Dodge: This is a negative amount, based on how fast the target ship is. It is doubled if the target is manoeuvring without firing weapons.

Targeting

Beam weapons and missiles are excellent at hitting a designated target. This is due to their inherent accuracy bonus.

Stationary positions do not get a dodge bonus, and larger positions also suffer from a greater chance of being hit.

Rail Weapons

These are notoriously inaccurate primarily on account of the relatively low speed of the ammo they fire. For this reason they are best suited to positions that have superior accuracies or that are attacking stationary targets. Basically they are excellent for pounding starbases and outposts.

Specific Targeting

It is possible to designate a specific category of items to aim for. This is set in the combat options. This in no way guarantees that the item category will be hit - the total mass of items in the category is used to create a virtual target within the general mass of the position. This may mean that if only a small mass of the category exists there will still not be a high chance of hitting it.

Obviously the total accuracy of the weapon fired will be used to determine if the specific category designed will be hit. For this reason space fighters and space bombers are the most effective at targeting specific categories.

Dodging

The ability to dodge is based on the combat speed of the ship and the hull type used in construction. Lighter hulls would tear apart if they attempted the same combat manoeuvres as those performed by heavier designs. As such, even though a ship constructed from heavy hulls may have the same combat speed as one built from the same quantity of extra light hulls, the heavy hull ship will have a much higher dodge value.

Inertial Dampers

While actually restricted technology they are mentioned here for completeness. These items alter the field effects relating to the laws of impulse and momentum. The overall result is that they will allow a ship that is smaller than a specified number of hulls to perform better dodges, i.e. the installation of an inertial damper will increase the dodge value of a ship.

Negative Targeting Bonus

While the targeting bonus due to targeting computers can only be as great as the sensor power, having a dodge higher than the targeting bonus will reduce the effective targeting bonus by the difference. The overall result is that if a ship is designed to have a high dodge it should carry extra sensors and targeting computers to cope with the position's own ability to dodge.

Bell Curve Distribution

Phoenix: Beyond the Stellar Empire uses a system based on bell-curve distributions. This allows a largely predictable result from all forms of attack. By using this system, it ensures that while players can be confident of results, an occasional random factor will creep in leading to flukes.

The bell curve for the hit determination gives a peak at 7.5 ($= 2.5 + 2.5 + 2.5$). This means that firing weaponry with a total accuracy of greater than this value will have more than a 50% chance of success. Beam weapons with an accuracy of +6 have a minimum bonus of +9 before any targeting bonus is applied. This means that they have very little chance of missing. The significance of a bell curve is more profound when the total accuracy is around 7.5. If the accuracy shifts even slightly in one direction or another, there is a dramatic change in the chance of hitting. This is because the curve represents the likelihood of a generated number falling at such a number. So total accuracies greater than 11 give a near perfect chance of success, while total accuracies less than 5 give very little chance of hitting.

Blowing Up

Ships and platforms are closed environments that require the entire structure to remain intact in order to keep functioning. Should too much damage be suffered by the hulls of the structure, there is a chance that the ship or platform will explode. If this happens the position is immediately reclassified as **debris** and any item that survived the explosion is listed as part of the debris. This can even include some of the hulls that were not completely destroyed.

Integrity

Normally a ship only has a chance of blowing up once it has suffered over 50% of its maximum hull damage. In combat, each time a ship or platform is hit and suffers damage, there is a chance of an integrity test if it is beyond the 50% hull damage threshold. The chance of forcing an integrity test increases exponentially as damage gets closer to maximum (100%) hull damage.

The chance of integrity failure is 100% minus the **current integrity** of the ship (with a minimum value of 20%). This means that warships should aim to maintain integrity of at least 80%, in order to avoid an unnecessary increase to the risk of being blown up in combat.

Once a ship suffers 100% of its maximum hull damage it will always explode. In the case of dedicated warships, it is very unlikely that by this time that there will be much left of the ship!

Maximum Hull Damage

The maximum damage that can be sustained by a ship is equal to the number of hulls multiplied by the damage sustainable per hull. This is shown for the basic hulls for each type of hull category in the table below.

Hull Type	Standard damage per hull
Heavy	400
Normal	100
Light	25
Xtra Light	5

A ship built from 75 normal hulls can therefore suffer up to 7500 damage before blowing up, although in reality it is likely to blow up before this is reached due to the integrity tests. Compare this value to a ship built from 75 xtra light hulls. This will only be able to suffer a maximum of 375 damage to the hulls before exploding. It is therefore very clear that heavy hulls are vastly superior in combat than any other.

The table above only gives the damage value for the standard (“mark I”) hull for each category. More advanced versions of each hull are capable of suffering more damage. There are also other forms of hull that have been developed by alien technologies. These have their own properties that may make them superior or inferior in combat.

Debris

Every item listed in a debris field is considered salvage and as such it can be picked up by any position that is not currently pinned in combat. Debris is still considered the property of the original owner of the position that blew up and as such it is given a security code. In this circumstance however, it does not prevent other positions from picking items up from the debris. The security code is used to determine if the pick-up is a friendly or hostile transaction. If a position doing the salvage uses the security code, then the picking up of troops is considered a friendly action and the troops are added to those on the position being picked up. If the position doing the picking up does not use the security code then it is presumed that the position doing the picking up is a hostile position and any troops picked up are immediately reclassified as prisoners. Due to the nature of the pickup, the troops cannot in any way prevent their own capture, nor will they have access to the rest of the ship so they cannot attempt to board the ship. It is simplest to imagine the troops are clinging to floating wreckage or within escape pods and strung out through space, possibly as far as a thousand kilometres from another piece of wreckage.

Nuclear Weaponry

These weapons of mass destruction are truly devastating if not defended against. Fortunately due to common knowledge of ISR fields their danger is mainly to native populations with low technology.

A nuke works by producing runaway nuclear fission or fusion. The result is the release of a vast amount of highly energetic particles. These will blast the region surrounding the detonation to atoms. This would normally reduce even a large starbase to dust in seconds.

The ISR field causes any particles over a specific energy threshold to undergo quantum jumps. The result is that the nuclear explosion is effectively damped. This does still leave a large amount of energy, produced by the lower end of the critical reaction. This can still be quite powerful.

Nuclear Susceptibility

All platform hulls come equipped with integral weak ISR fields. Command complexes and security complexes also produce weak ISR fields. Should a position not have some method of generating an ISR field however, it will be labelled as Nuclear Susceptible. Should the position be hit by a nuclear weapon it will suffer anywhere from 10,000 damage to 1,000,000 damage, depending on the type of nuclear weapon used.

World Field

The ISR field required to dampen a nuclear weapon anywhere on the world is very small. In fact it is difficult to detect unless specifically looked for. As the source is a subspace field interaction, pinpointing its source is impossible. All that can be determined is that there is an ISR field being generated.

Chemical and Nerve Gas Weapons

These horrific weapons are designed for mass extermination and nothing more. They are effective at targeting life forms, although due to training and personal equipment, they are more likely to kill civilians than troops. They are also less likely to kill veterans than ordinary trained troops, because of their greater experience. Basic mercenaries are also badly affected by these weapons. The presence of hospitals will minimise some of the risks. Their deployment often happens in times of peace as an initial surprise strike, so security complexes have a chance of preventing their release prior to the attack.

Designing a Ship's Configuration

Combat can seem overwhelming to the uninitiated. Questions such as "What are the best weapons to use?" and "How many combat engines should be used?" are frequent. Then there are the more subtle points such as the difference between a heavy ship and a normal one. This section does not state which is the best design as the dynamism of the system means that there is categorically **no** best design. It can give pointers towards what is better suited to a specific role.

Function

The very first thing to consider is the tasks a ship is designed to perform. There is absolutely no point in making an extra light hulled ship a warship. Do not be tempted by the huge volume of installation space - bigger is not always better! Extra light hulled ships cannot carry much armour and the hulls are paper-thin. This means that they tend to be destroyed very quickly. Worse still, many of the items within the ship are often left intact and can be salvaged, possibly by the enemy.

Ship Size

The size of the ship depends largely on function. The basic rule of thumb is to make a ship the smallest possible to perform its function. The reason for this is simply maintenance. Each ship needs maintenance every few months depending on its hull type. This requires patches. Patches are constructed out of resources and need to be built. Further, ships need crew and crew need to be paid for. Lastly, larger targets (especially of lighter hull types) are not significantly harder to destroy, and it is harder to pin many ships than it is a few. Combat is often about numbers. Ten small pirates have more chance of locking a freighter in combat than two large pirates, especially if the freighters have escorts. Further, huge platforms may still be able to deliver enough damage to blow a huge ship up. If they are targeting small ships, they are wasting damage.

Speed

All warships should have a few thrust engines to prevent them being trapped in orbit – a single thrust engine is too vulnerable to a lucky hit. Their combat speed however is largely dependent on their function. Escorts should be the fastest. These ships should accompany both warfleets and trade convoys. Their sole purpose is to sacrifice themselves if necessary in order to allow larger ships to escape. As such larger warships need only have combat speed in the region of 1.5g. Skirmish fleets such as those that rely on light armour and manoeuvrability may well have much higher combat speeds, allowing them to enter or leave combat at will. This is useful for ships that need to rearm.

Ship Examples

Generic Freighters

All these ships use hulls that are easily destroyed by torpedoes and missiles and as such they should carry at least some form of point defence such as gatling lasers and possibly if space allows a couple of phalanx launchers and missiles.

Huge Freighter

They are constructed from xtra light hulls and have very slow combat speeds. They need regular maintenance even though they do not perform many jumps. They avoid any other form of integrity checks such as entering orbit, landing and combat, relying on a starbase's shuttleports for most transactions. As such they have no need for combat engines and almost always have only landing engines where available even though they try to avoid entering orbit. This is simply to maximise cargo space. They have huge cargo space at the cost of everything else possible and where they can use as few crew as possible, making use of A.I. navigators and a single crew quarter. Defence is negligible, if present at all. When present it is in the form of shields (and then just enough to get through a single day of combat). Generators are not installed as it is assumed that any conflict will result in the need for a repair visit. Armour is unlikely to make a difference but if desired should be ablative. When they are shipping common items, they should set the combat option to dump cargo and flee. These are invariably used within a system or at least never venture beyond home space. Where possible these ships should travel in fleets and/or be protected by escort class ships.

Long Range Freighter

These are constructed from light hulls and again have very slow combat speeds. These are designed to trade both within home space and venture further afield in order to trade large volumes of low value goods such as foods and ores. They are vulnerable to attack so should never carry expensive merchandise and always use the dump cargo and flee combat option. Using offensive weaponry is pointless, as any serious encounter will lead to destruction of the ship. Defences include shields and maybe a single generator as maintenance or repair is not always immediately viable. A small combat speed (possibly around 0.5g) is reasonable and this is produced from thrust engines only. As they spend most of their time in deep space, the use of landing engines is very limited. Tractor-beams may be employed in a reasonable number, in order reduce the chance of being pinned. As most fast ships are small in order to avoid wasting a large ship, 20 tractor beams is considered reasonable in most cases, although the loss of 200mu's installation space for something that may not be enough is a matter of judgement for the designer. These ships should always make use of ablative armour. As with the huge freighter these ships should travel in fleets and/or be protected by escort class ships.

Independent Freighter

These are designed to go anywhere and carry virtually anything. They are designed to service outposts without hiports and set up ground parties on the surface of planets. For this reason they have to be constructed from normal hulls and have thrust engines. Depending on whether they will be used in safe home-space, they may replace some of these thrust engines with landing engines. Weaponry (if installed) should be designed to cope with small to moderate threats such as lightly armed pirates. Light photon guns and tractor beams are sensible although the option to dump cargo and flee is sensible when carrying low value goods. For most affiliations, the independent freighter should make up the bulk of the shipping fleet due to its versatility and low maintenance costs. They should make use of ablative armour and have some shielding and probably a couple of shield generators so that they can replenish their shield factors over a week or two.

Escort Warships

Escorts have one sole purpose, to ensure the escape of the freighters they are protecting. As they are not designed for speedy response from elsewhere, they should only carry the same ISR drives as the ships they are escorting, usually either ISR 3 or ISR 4. As they will not need to enter orbit, they have little need of thrust engines and can rely almost entirely on combat engines. This will give them the necessary combat speed to pin ships attempting to lock the freighters into combat. For these ships a combat speed of at least 2.5g is required – more if such can be squeezed from the design. As the ship is designed as escort, there is little point building it larger than 20 hulls. Weaponry used should be tractor-beams with possibly a fighter bay if a larger class of escort is designed. Both of these weapons are remarkably accurate allowing the escort to have a good chance of hitting despite a possible targeting penalty due to low quantities of targeting computers. Although this type of ship should be built from heavy hulls, it may be reasonable to assume that the escort class does not make full use of armour in order to maintain a high combat speed. A single layer of ablative armour may be suitable, as the escort will leave combat as soon as the freighters have left. On a 20 hull design this equates to roughly 30 ablative armour plates. **To safeguard their charge they should have the individual freighters on their defend list and the 'On Patrol' option set.**

Destroyers

These are designed to go to the aid of independent freighters and convoys that come under heavy attack, so they spend much of their time in orbital ring 10, ready to jump. As fast response ships they have to have ISR 1 drives but are not as concerned about combat speed. As they are not meant to be used in sustained combat they can be smaller ships than the standard ship of the line, probably around the 50 hull mark. They are designed to hit hard and fast, scaring off pirates and other aggressors and should be considered as largely disposable. As such they can make use of torpedoes and missiles or possibly photon guns and cannons. They should make use of maximum ablative armour as they will not be utilising other defences and are also not expected to engage in long drawn out battles, but return to base between incidents.

Ship of the Line

These are the standard warship type, used both in defence and attack. They are not concerned with getting anywhere fast so can make use of the small sized ISR 4 drives (1/8th the size of ISR 1 – for a 100 hull ship saving 700mu's). They should rely primarily on a mixture of combat engines and thrust engines, as they may need to leave or enter orbit, which will only be possible if they have a manoeuvre speed. They should carry a mixture of offensive weaponry but not neglect point defence, as a few torpedoes will devastate even a heavily armoured ship. The range of weapons is dependent on the type of mission the ship is to undertake. Heavy weaponry such as photon cannons and photon batteries are required to combat other warships, while a few lighter weapons are useful for taking out shields and dealing with lightly armoured ships. It is probably best to avoid missiles and torpedoes for ships that will spend weeks in combat. They are useful for ships being used primarily in defence however as they are close to their nearest supply depot. The alternative is to take along an independent freighter class ship with spare ammunition - but make sure that it remains away from combat, but close enough to reach in a reasonably short period of time!

Barrage Ships

These are designed to deliver a short sharp burst of damage, using primarily missiles with a few torpedoes thrown in. They are designed to enter combat after the initial assault - possibly day two or three. The reason for this is that they should be instructed to only direct their attacks against ship known not to be carrying phalanx missiles and other point defence. They should have clear support and defend lists and only carry on their enemy lists the positions they desire to attack. It may be helpful if they are equipped with korondite armour, as they do not wish to be detected prior to entering combat. An excellent combat speed is very useful, as they need to leave combat once the damage has been delivered. They are basically a modification of destroyers, although their primary targets are heavy warships rather than typical pirates and as they are put in position prior to the attack, they can also utilise ISR 4 drives and save space. An alternate use is to bombard fixed installations

Carriers

Carriers are designed to support the fleet using space fighters and bombers. They are basically little more than fighter bays with some point defence shields. As long as they do not utilise offensive weaponry they should manoeuvre in combat, thus giving a superior dodge value for their engines. It may be best to opt for a selection of interceptors, fighters and bombers although the ratios are likely to depend on the targets chosen. As space fighters are incredibly accurate it is always best to choose between the specific targeting options. Again the choice will depend on the objectives of the mission. Carriers should make use of armour plate, as they are likely to be hit repeatedly during the combat. A fast combat speed is not necessary but it is useful to have some ships specifically designed to defend these ships, especially if normal hulls are opted for instead of heavy hulls. It is strongly advised that the normal-hulled variety of carrier does not enter combat against heavily armed platforms as any illusion of defence offered by defending ships will be swiftly shattered. One possible use, is for a couple of carriers to provide an interceptor screen for a fleet, or several carriers may provide the defensive screen between them.

Mounting an Attack

There are many ways to attack an enemy, the simplest is to amass a huge fleet and merely set off. Unless the odds are heavily stacked in the fleet's favour from the off, this is likely to end in disaster at the hands of any defenders that have even a modicum of sense. The following scenarios are merely suggestions and in no way should be considered definitive. The simply cannot take into account the rich variety of items available nor the general background layout of defences. A quick read of The Art of War by Tsun Tsu will be invaluable to any upcoming general although a few pointers are given here.

Speed

Many successful attacks have been clumsy but fast. Slow manoeuvres rarely succeed.

Quite simply it is the case of bringing to bear as much power as possible within the shortest possible time, in order to cut down the options and response time of the enemy. If they are stupid enough to have overstretched themselves and have no rapid response forces close by, do not give them the opportunity to bring reinforcements from the other end of the galaxy.

Know the Enemy

If you can predict the enemy's strategy then you can determine how to defeat them.

In this case it is an information gathering expedition. Scanning ships and trading information, especially battle reports. If an affiliation is daft enough to have all their fleets on permanent display in orbit of trade starbases then their internal set-up can be determined. This will allow a fleet to be put together that is specifically designed to defeat it. If it is heavy on scints and low on point defence, then hit it with barrage ships. If the other way around, hit it with photon batteries.

In the case of platforms, if they have inadequate point defence it may be possible to send in a fleet of barrage ships with just enough ammunition for the opening round. This could be devastating enough to wipe out the defence in a single round, before it has chance to retaliate as they will be leaving on round 2.

Attack where they least expect it

If you are going to attack and they know where and roughly when, then the fight will be a lot harder. It is therefore sensible to ensure that all intelligence gathering is discreet and that any build-up of forces is subtle. A rogue asteroid or other low sensor profile celestial body makes an excellent location for an armada build-up where the target is in a distant location. In these cases, it is reasonable to leave a survey ship in orbit for a few months to monitor traffic in the orbit. Even orbital ring 15 will not hide an entire armada for very long if the quadrant is a subject of regular patrols. It is also best to ensure that the attack will be occurring roughly the maximum distance away from the armada. This will invariably be as many as 8 systems away from the target. It is even more useful if the armada location can be arranged to produce a fork. (A fork is a chess term indicating that there is a choice of targets). The opposition can then only concentrate on defending one, or risk losing both one after the other.

Those that always win first eliminate the chance of loosing

Basically only commit to an attack that will ensure victory. This does not have to mean a grand scale, as even a large combat is in fact many small interlocking combats. The best approach here is to ensure that as many of the enemy as possible are posted. This will allow specific ships to add individual posted targets to their enemy lists. With some foreknowledge, squads of ships can therefore be pre-designated in order to be most effective against a specific target. This may prove critical in the opening assault – again, foreknowledge of your target is key.

Strategic Bombing

The best way of winning is to do so without fighting.

By this it is meant that there may be a possible to weaken the target starbase or outpost with some serious rail weaponry or chemical weapons before sending in the ground troops. It is understood however that this method of attack may have some serious repercussions on the diplomatic front for certain affiliations. The use of incredibly accurate ground and space weaponry such as fighters in order to target weapons is another method to reduce troop casualties during the final push.

Militia

Conservation of Resources

As all ground combat is likely to take more than a day or two once the troops collide, casualties can be expected. As trained troops have cost stellars, their use in the opening gambit should be avoided. They should be kept in a ground party far from the battle, probably controlling the longer ranged weapons. All that is initially required is to gain some control of the target. Initially therefore mercenaries should be used. These should be recruited just for the attack, with no intension of retaining them after the conflict (although maybe some of the veterans produced as a consequence of the combat could be retained). They only need to be paid while they are alive, so can be used as cannon fodder to swamp the defences. Only after the initial encounter should this force be boosted with trained troops and even then it may be best in many cases to have smaller ratios of trained troops within the general mass of mercenaries.

Conservation of resources also applies to transport; so in cases where the battle is a long distance away, it may make more sense to utilise only crack troops, as this will ensure greater chance of success based on limited cargo capacity.

The choice to use either mercenaries or trained troops is therefore a question of logistics.

Defence

To win, you must first become invincible and then look for openings in the enemy defences.

To be invincible is to bury oneself in the depths of the earth.

Basically, it is impossible to lose a battle if the enemy cannot get through the defences, and mistakes are not made to give the enemy an opening.

The construction of a starbase or an outpost without adequate defences is a **serious** mistake. The basic goal is to make all potential targets harder to take than they are to build. If it is easier to capture and hold a starbase or outpost than it is to build one, it is fairly simple logic to deduce that given enough time, somebody will attempt to capture the position.

Determining what should be used in defence is a difficult question, although some basics are easily defined:

Platforms

Platforms should only be used where there is no desire for secrecy. They should be large and well defended, both with troops and with point defence and possibly shields. In the case of the former, it is best to use marines, as they are the most adept at repelling borders. **Around 25% of the total internal space should be dedicated to defence.** This should not include troops as their quantity largely depends on the type of items installed.

Starbases and Outposts

For a starbase or outpost, **defence should be approximately 20% of the total mass.** This should include all ground ordnance, shields, bunkers and point defence. The location will largely determine what ratios to go for, but sufficient gatling lasers to give a near perfect shield is imperative.

Troops

Where a population is present, it is also useful to have as many mercenary recruitment complexes as possible. These should remain closed for the most part. During any attack on the starbase though, they should be opened at the first available opportunity and maximum recruitment of mercenaries should begin. This (normally excess) cannon fodder will be used during the daily battles.

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