

Starship Design Process

First, we'd like to thank David for letting us play in his yard, as it were. Designing a game is a very different process from writing a novel (as David knows full well, having been the author of more than one game in his career). In many ways, the constraints of writing a game are much tighter – more of what you're doing is visible to the audience, and much more of it is open for poking and prodding. As a result, some things in the series got tweaked, with David's blessing. The most obvious tweak was adjusting the dimensions of the ships to reconcile with their listed masses (aka "The Great Resizing"), which allowed a much more rational ship design engine.

Think of it as David hiring some guys in blue coveralls to do a little bit of light landscaping, put in a sprinkler system, trim the trees and rake the gravel on the walkways.

The initial design research for SITS was extensive reading and re-reading of the novels, taking notes for the ship and scenario databases. Information was collected from the books, Infodump postings, private correspondence with David, the tech bible and even conjecture raised on Baen's Bar and other discussion boards.

The second phase of the process was to rectify the database entries with the original design system provided by David. Of the 17 classes chosen for SITS, seven had design notes in the original system. Using those ships as a baseline, the rest of the ships for the boxed game were designed with the same system as an initial first pass. We knew that once we had our own design system in place, it would need to conform as closely as possible to the original system.

During this process, a couple of errors were found and corrected in the original designs. Most of the errors were minor, but one proved to be a rather thorny problem.

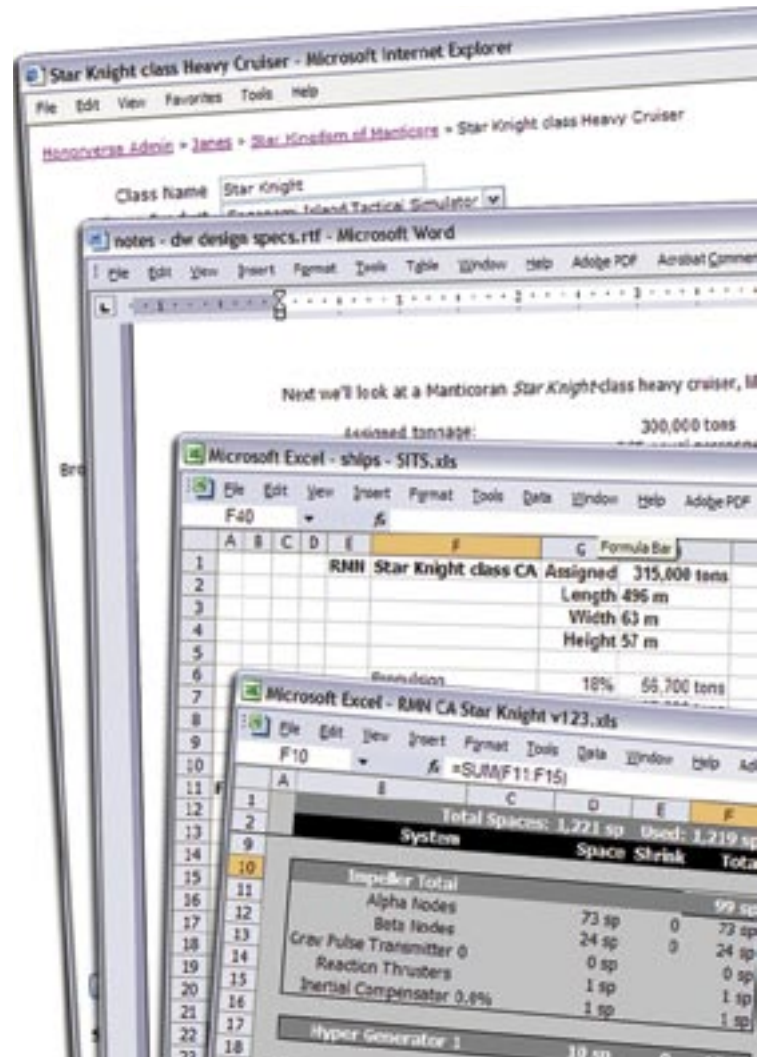
The original design of the Star Knight at 300,000 tons called for a broadside of twelve missile tubes, six lasers and three grasers. This was originally thought to be a slight problem, but once the numbers were punched in, the final design to those specs ended up over 100,000 tons overweight.

The Star Knight was not only described in detail in The Honor of the Queen (stating or implying a broadside close to the numbers above) but is used as a meterstick for other designs in quite a few of the later books. It is also described as having roughly the same offensive power as a Prince Consort (weighing in at 260,000 tons) and is said to have too little mass devoted to offensive systems for a ship of its size. Unfortunately, based on every other design in the initial series (David's as well as ours) those three statements were mutually contradictory. A 300,000 ton heavy cruiser with a 12 missile broadside was not only literally impossible to build without some unworkable compromises, but would also have been significantly over-armed for its rate.

So, with those two pieces of data in hand, the Star Knight was reduced to a broadside of 8 missiles, 3 laser and 2 grasers. Its defensive armaments were left the same (a total of eight countermissile launchers and 8 point defense clusters per broadside), which satisfied the "overbalanced defensively" criteria. The Prince Consort was built from there, removing defensive installations and weakening the sidewall, and the Crusader followed, with a further reduced broadside to make room for its flag facilities.

There were several other changes to the original designs, but most of them were under the surface, juggling ammunition allotments, etc. When all was finished, we were left with a set of 17 ships that balanced each other nicely in terms of offensive and defensive power, with the Star Knight fitting perfectly into its described place, despite the furthest deviation from the numbers David provided.

At David's request, we compiled a changelog noting anything in the books that needed to be changed now that we had a design system in place. This was primarily to find length references that needed to be updated after "The Great Resizing" but also included (again, at David's request) any designs that needed to be updated as a result of the new design system.



Star Knight class Heavy Cruiser

Ships in Class

Alchemist, Cantrip, Circe, Conjuror, Druidess, Enchanter, Fearless, Magician, Magus, Merlin, Necromancer, Oracle, Runebearer, Santander, Seeress, Shaman, Sorceror, Star Knight, Star Ranger, Thaumaturge, Warlock

Expected Service Life

1893 to 1926 PD

Specification

Mass: 305,250 tons

Length: 523 m

Beam: 63 m

Draught: 53 m

Acceleration: 509.3 G

Crew: 925

(47 Officers, 424 Enlisted, 454 Marines)

Power:

3 Isler Corporation GM-4R Fusion Reactors

Electronics

SPG-29/a Gravitic Detection Array

SR-12 Phased Radar Array

SL-13 Lidar Array

CA-9(34) Fire Control System

CD-9a(26) Point Defense Fire Control System

ELQ-131/4 Electronic Countermeasure System

Armament:

20 Mod 7b Missile Launchers

2 127cm Lasers

6 Mk73 105cm Lasers

4 Mk5a 140cm Grasers

26 CM-Mod 5b Counter Missile Launchers

26 PD-Mk16(5) Point Defense Laser Clusters

Magazines

400 Mk13 Anti-Ship Missiles

1534 Mk21 Counter Missile

8 Mk23 Long Range Recon Drones

6 Mk15 NC Tethered Electronic Warfare Drones

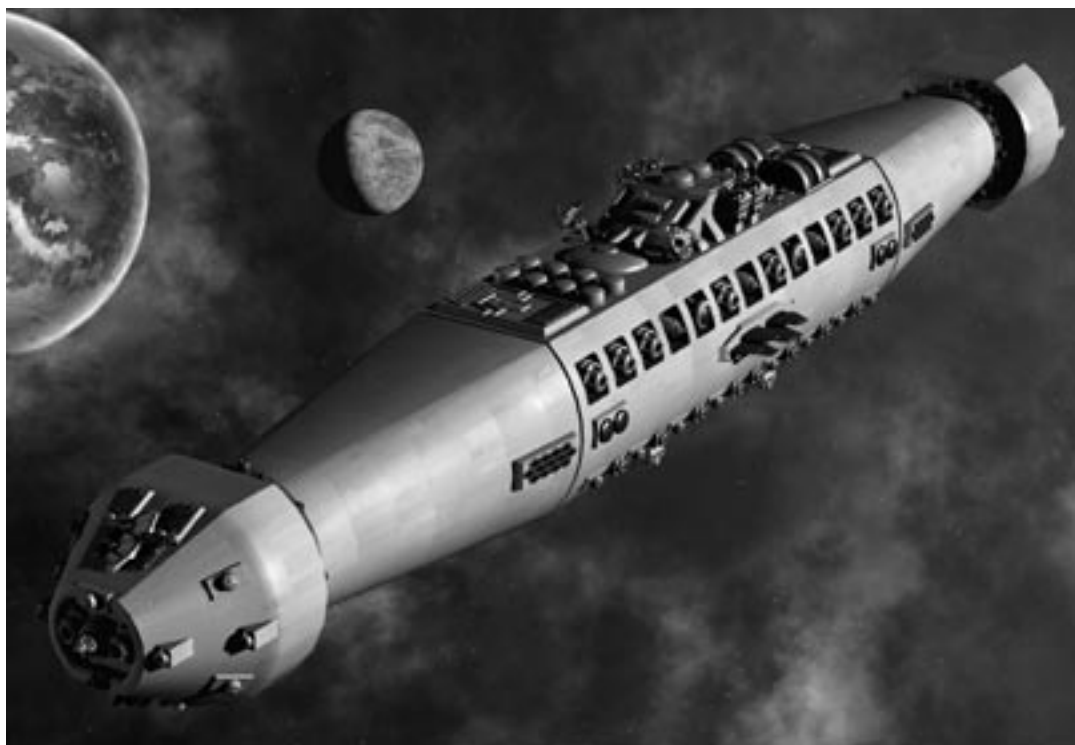
Small Craft:

4 Mk28 *Hawk-class* Pinnaces

6 C3 *Dakota-class* Cutters

Design and Construction

The ships of the *Star Knight-class* are the RMN's latest heavy cruisers. Designed to replace both the *Prince Consort* and *Crusader* classes, the *Star Knight* combines the offensive power of a *Prince Consort* with the flag facilities of a *Crusader*.



The *Star Knight's* more powerful sidewall generators, heavier armor, better electronic warfare capabilities, and more numerous point defense systems make them at least thirty percent tougher than the older *Prince Consorts*. However, combat experience has shown that too little of their volume was allocated to offensive systems and too much was used on defense.

One of the most controversial design choices is the installation of a third reactor as opposed to the normal two found on most ships of this size. While there are benefits in redundancy, only a single reactor is required to power the ship and the additional volume could have been used to mount a heavier broadside.

As a flagship, the *Star Knight* has sufficient boat bay space for three additional pinnaces, as well as the additional accommodations for a flag officer, staff and visitors. Its flag accommodations are quite spacious for a mere cruiser.

With shortages in *Crusaders* starting to appear all along the front, shipyards at Hephaestus and Vulcan are producing *Star Knights* as quickly as possible-given the limited amounts of yard capacity that can be diverted from capital ship construction for any sort of cruiser.

The *Star Knight* is due to be replaced in 1908 by the *Edward Saganami-class*. The *Saganami* design, still in the planning stage but expected to be at least ten percent larger, should resolve any deficiencies in the *Star Knight's* offensive power.

Doctrinal Notes

With the critical shortage of *Crusaders*, The *Star Knights'* flag accommodations forced the Admiralty to keep tapping them for the detached command roles the *Prince Consorts* couldn't fulfill properly.

Star Knights are frequently assigned to frontier and convoy deployments without capital ship support, and often find themselves engaged with fast battlecruiser/cruiser-level raiding forces, with correspondingly heavy losses.

Notable Units and Battles

The most notable ship in this class is HMS *Fearless*, which was involved in the defense of Yeltsin's Star in 1903 P.D. While many details of the battle are still classified, what is known is that under the command of Captain Honor Harrington, HMS *Fearless* and the *Chanson-class* destroyer HMS *Troubadour* defeated a *Sultan-class* battlecruiser in the service of the Masadan Navy.

Royal Manticoran Navy - Star Knight class CA

Crew: 47 Officers, 424 Enlisted, 454 Marines
 Endurance: 12 Weeks
 Small Craft: 4 Pinnaces, 5 Cutters
 14 Recon Drones

Structural Integrity
 2 3 4 5 6 7
 8 9 10

Bridge
 1 2 3 4 5 6 7

Flag Bridge
 1 2 3 4 5 6 7

Communications
 1 2 3 4 5 6 7

ECM
 40 32 16 8

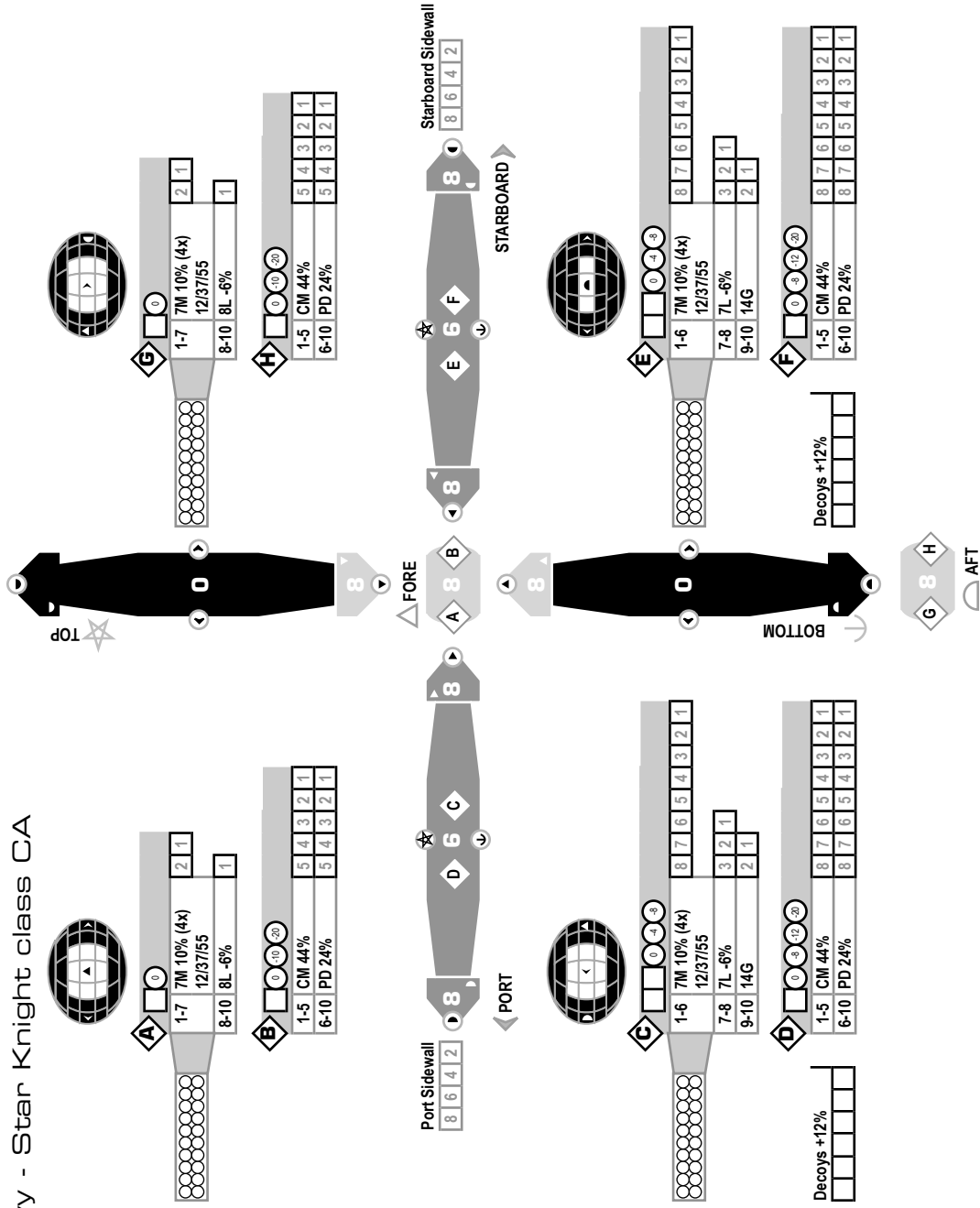
Gravitic Array
 1 2 3 4 5 6 7

Impeller
 4 3.5 3 2.5 2
 1.5 1 .5 0

Hyper Generator
 1 2 3 4 5 6 7 8 9 10

Inertial Compensator
 5

UDST
 1 2 3 4 5 6 7 8 9 10



8 FORWARD HAMMERHEAD	6 PORT BROADSIDE	6 STARBOARD BROADSIDE	8 AFT HAMMERHEAD	6 TOP	6 BOTTOM	4 CORE	CONTROL
Hull Depth: 111	Hull Depth: 39	Hull Depth: 39	Hull Depth: 111	Hull Depth: 35	Hull Depth: 35	Hull Depth: 111/39/35	1-3 Bridge
1 UDST	1 UDST	1 UDST	1 UDST	1 UDST	1 UDST	1 UDST	4-5 Flag Bridge
2 UDST	2 Impeller	2 Impeller	2 UDST	2 UDST	2 UDST	2 UDST	6-7 Communications
3 UDST	3 Mount C	3 Mount E	3 UDST	3 UDST	3 UDST	3 UDST	8-10 CIC
4 Mount A	4 Mount C	4 Mount E	4 Mount G	4 UDST	4 UDST	4 Impeller	SENSORS
5 Mount A	5 Mount C	5 Mount E	5 Mount G	5 UDST	5 UDST	5 Sidewall	1-2 Gravitic Array
6 Mount B	6 Mount C	6 Mount E	6 Mount H	6 UDST	6 UDST	6 Sidewall	3-9 Offensive Fire Control
7 Mount B	7 Mount D	7 Mount F	7 Mount H	7 Impeller	7 Impeller	7 ECM	10 Defensive Fire Control
8 Mount B	8 Mount D	8 Mount F	8 Mount H	8 Impeller	8 Impeller	8 Hyper Generator	IMPELLER
9 Sensors	9 Sensors	9 Sensors	9 Sensors	9 Impeller	9 Impeller	9 Control	1-6 Beta Node
10 Magazine	10 Magazine	10 Magazine	10 Magazine	10 ECM	10 ECM	10 Structural Integrity	7-9 Alpha Node
							10 Inertial Compensator

Sword class Heavy Cruiser

Ships in Class

Claymore, Cutlass, Dirk, Drusus, Durandal, Epee, Estoc, Excalibur, Falchion, Flamberge, Foil, Gladius, Jian, Katana, Khopesh, Poignard, Raiden, Rapier, Sabre, Scimitar, Shamshir, Sword, Wakasashi

Expected Service Life

1867 to 1909 PD

Specification

Mass: 286,250 tons

Length: 512 m

Beam: 62 m

Draught: 52 m

Acceleration: 510.2 G

Total Crew: 960

(77 Officers, 693 Enlisted, 190 Marines)

Power:

2 DR/7 type 4a Fusion Reactors

Electronics

AG-12 Gravitic Detection Array

AR-15 Phased Radar Array

AL-6(c) Lidar Array

SC-29(24/18) Integrated Fire Control System

Armament:

18 LMF-5(c) High Speed Missile Tubes

2 L/130 Anti-Ship Lasers

10 L/118 Anti-Ship Lasers

18 LMC-8(g) Counter Missile Tubes

22 P-16(5) Laser Clusters

Magazines:

324 F17 Impeller Drive Missile

360 C2 Counter Missiles

10 RD.12 Recon Drones

8 DQ.25 ECM Decoys

Small Craft:

2 D.435 *Ouragan class* Pinnaces

3 DB.100 *Mercure class* Cutters

Design and Construction

The *Sword-class* heavy cruiser is an older design, first proposed in 1864 as a replacement for the *Champion-class*, the last unit of which was decommissioned in 1871.

The design of the *Sword* is an even more extreme case of the heavy missile-design philosophy used in the *Bastogne-class* destroyer.

The *Sword-class* does correct some of the shortcomings of the *Bastogne* by accepting a lighter broadside throw weight in favor of larger magazines. However, its countermissile magazines hold less than a third of the ammunition they need to last any typical engagement.



The *Sword-class* is the only ship in the People's Navy to mount the LMF-5(c) missile tube. The LMF-5(c) has a faster click time than most launchers, at a cost in reliability and service life. The problem lies in the high-speed loading mechanism, which has a tendency to freeze unexpectedly when shuffling a full magazine queue. Many captains have learned to fill their magazines one to three rounds short of the nominal rated load to help mitigate this problem.

There have been several modifications and refits to the class, all of which attempted to address the counter-missile shortcomings by providing additional counter-missiles magazine space, usually at the expense of removing energy weapons or reducing offensive missile tubes. None of them has been satisfactory, however, since wartime experience indicated that you simply could not build an effective heavy cruiser on under 300,000 tons with current-generation Havenite hardware.

Doctrinal Notes

While the *Sword-class* has the magazine space for several minutes of sustained fire, its critical shortage of countermissiles force it to seek a decisive advantage early in the battle. It is not designed as a close combatant, but most captains will try to close the range quickly to give them the best targeting solution.

By the time the range has closed, the *Sword* must rely on the quick cycle time of its launchers to overwhelm the target with rapid continuous fire. Given that the *Sword* will most likely have depleted its countermissile magazines by that time, its only hope is to destroy the opponent before it is destroyed itself.

Notable Units and Battles

The most successful of the refit proposal was the one that used PNS *Flamberge* as a test bed. Rather than reduce the energy armament, with the associated decrease in defensive effectiveness, the engineers segmented off portions of the offensive magazines and used the space for additional countermissile magazines. While it gave *Flamberge* almost twice the endurance on its countermissile launchers, routing the countermissile ammunition through the already unreliable ship-killer magazine systems resulted in frequent jams, that could disable both launcher sets on a given broadside.

