

**To:** Christopher L. Bennett  
David Spratley

**From:** Byron Yep, Articled Student

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**Re:** The End of the Star Wars / Star Trek Debate

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## INTRODUCTION

You have implicitly asked me, numerous times, to end, or at least give some direction, to the ongoing debate in respect to the Star Wars / Star Trek battle, and more specifically the question of who would win a battle between an Imperial Star Destroyer (“ISD”), from the Star Wars series, and the USS Enterprise D (the “Enterprise D”), from Star Trek the Next Generation.

This issue, it appears, has been an ongoing source of dispute. Chris Bennett is of the position that the Enterprise would clearly win. Dave Spratley, on the other hand, is adamant that the ISD would be victorious.

This memorandum will quantitatively compare the two vessels to determine the most likely outcome of a one-on-one battle.

## BACKGROUND INFORMATION

### 1. Star Wars

A science fiction series, created by George Lucas, of six movies (which has spawned numerous other types of media productions) that is set in a “galaxy far far away,” the Star Wars series traces the rise and fall of the Galactic Empire (the “Empire”), an evil regime.<sup>1</sup>

ISDs are a medium sized warship of the Empire. Prior to the rise of the Empire, the Galactic Republic employed smaller, similar ships: the Victory and Venator class destroyers (as seen in Episodes II and III).<sup>2</sup>

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\* The author would like to grateously thank Davis & Co. LLP for their use of the internet to perform the web searches.

<sup>1</sup> There is much philosophical debate in respect to whether the Empire was in fact truly evil; this is best left for another debate at a later time.

<sup>2</sup> [http://experts.about.com/e/s/st/Star\\_Destroyer.htm](http://experts.about.com/e/s/st/Star_Destroyer.htm)

2. **Star Trek the Next Generation**

Created by Gene Roddenberry, Star Trek the Next Generation (“TNG”) is a science fiction television series that traces the lives of the crew of the Enterprise on their mission “to explore strange new worlds, to seek out new life and new civilization, to boldly go where no one has gone before.”

TNG is set in the future and the series began in the year 2364. The Enterprise, a Galaxy class starship, was commissioned in 2363 and throughout her lifetime was the flagship of the Federation’s fleet.<sup>3</sup> Although she is a ship of exploration, the Enterprise D was also the Federation’s most heavily armed ship.

**ISSUES**

1. What factors must be assessed when evaluating the battle between the Enterprise and an ISD.
2. Who would win?

**BRIEF ANSWER**

1. The following categories should be compared when analyzing the result of this fight: size, weaponry, defences, propulsion & manoeuvrability, manpower & crew, and any other relevant vessel factors.
2. An **Intergalactic Star Destroyer** would clearly be victorious.

**ANALYSIS**

1. **Size - Advantage: ISD**
  - (a) *Imperial Star Destroyer*

Larger and more powerful than its Republic predecessors, the spearhead-shaped ISD is 1600 meters in length. This value, although never specifically stated, has been confirmed through a variety of sources and calculations.<sup>4</sup>

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<sup>3</sup> The Federation is a peaceful organization of planets and races centered around Earth Humans.

<sup>4</sup> See as example: <http://www.theforce.net/SWTC/isd.html>

Based on calculations derived from photos of the ISD, and considering that the length of the vessel is 1600 meters, the width can be calculated as 509 meters (at its maximum) and depth as 129 meters (not including the command superstructure which itself is 121 meters tall).<sup>5</sup>

Summary: 1600 x 509 x 121 meters (maximum dimensions)

(b) *USS Enterprise D*

Being a member of the largest class of starships of its era, the Enterprise D was 642 x 463 x 173 meters. Its mass was 4,500,000 tons.<sup>6</sup>

2. **Weaponry - Advantage: ISD**

(a) *Imperial Star Destroyer*

(i) Distribution and Type

Although some ancillary sources mention the possibility of an ISD carrying missiles, the majority of the relevant literature only mentions the ISD having at its disposal varying types of laser and ion cannons. Furthermore, there are differences between the Type I and Type II ISD:<sup>7</sup>

*Type I:* have eight (8) turrets mounted in groups of four (4) on either side of the main superstructure. Six (6) of these turrets contain two heavy turbolasers, the remaining two turrets each have two heavy ion cannons. *Total heavy cannons = 16.* Additionally, the Type I ISD has brim-notch turrets with a variety of turbolasers in each. These turrets are not seen in the later Type II ISDs.

*Type II:* have eight (8) turrets each containing eight (8) heavy turbolasers, four (4) turrets mounted on either side of the main superstructure. *Total heavy canons = 64.*

In addition to the main cannons (of both types) and brim notch turrets (on the Type I class), all ISDs have numerous other guns distributed over the surface of the vessel. These smaller cannons are not visible throughout the movies. However, there are many incidents where laser fire is seen to emanate from an unknown source, presumably one of these weapons.<sup>8</sup>

Also, the shape of the ISDs allows for maximum targeting of enemy vessels and ships in the forward arc would be susceptible to nearly all of the ISD's weapons.<sup>9</sup>

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<sup>5</sup> <http://www.theforce.net/SWTC/daggerdata.html#isd>

<sup>6</sup> [http://en.wikipedia.org/wiki/USS\\_Enterprise\\_%28NCC-1701-D%29](http://en.wikipedia.org/wiki/USS_Enterprise_%28NCC-1701-D%29)

<sup>7</sup> <http://www.theforce.net/SWTC/isd.html#weaponry>

<sup>8</sup> See for example the pursuit of Princess Leia's *Tantive IV* by the ISD *Devastator* in Star Wars Episode IV.

<sup>9</sup> *Supra*, at note 6.

(ii) Power

A single ISD is said to possess enough firepower to reduce an inhabited planet into “slag.” Rough calculations put the low level power output from this procedure at half a billion terawatts ( $5 \times 10^8$  TW) for the entire ship.<sup>10</sup>

Furthermore, each heavy canon on a Type I ISD has a 200 gigaton (TNT equivalent) blast. Presumably, the smaller cannons seen on the Type II would be not as powerful.

(b) *USS Enterprise D*

(i) Distribution and Type<sup>11</sup>

The Enterprise D carries two types of weapons: phasers and photon torpedoes.

*Phasers.* The phasers on the Enterprise D are classified as Type X phasers. Only phasers used as planetary defences are more powerful. Although there is much speculation about the number of phaser banks on the Enterprise D, it appears as though there is one main phaser array (with 200 emitters), two full-sized saucer arrays, and three half-sized arrays on the star drive section.

*Torpedoes.* The Enterprise D carries as standard armament of 275 photon torpedoes. In combat situations the Enterprise D could likely carry more. Each photon torpedo has an engine capable of producing its own warp field and thus can be launched while the Enterprise is at warp speeds.

There are two torpedo launchers (one forward, one aft) and up to ten (10) torpedoes can be launched at any one time.

(ii) Power

Each Type - X phaser emitter has a power rating of 5.1MW with the estimated power output of all the Enterprise D's phasers being 3.6GW.

A photon torpedo carries a 1.5Kg anti-matter payload that results in the equivalent energy of 54 megatons of TNT or  $3.1 \times 10^{16}$  Joules. However, the Federation was never able to develop photon torpedoes that could focus their blast energy, and it is estimated that only 17 of the 54 megatons of energy would impact a target surface.

3. **Defences - Advantage ISD**

(a) *Imperial Star Destroyer*

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<sup>10</sup> *Ibid.*

<sup>11</sup> <http://mario.lapam.mo.it/enterpri/1701-d.htm>

The shields on an ISD are designed to withstand a barrage of laser fire from any comparably armed Rebel ship. The heat dissipation of the shield generators is listed in the order of 70 trillion GW.

(b) *Enterprise D*

There are seven (7) shield generators on the Enterprise D, each of which is listed as having a 473 GW heat dissipation for a total shield capacity of 3311GW.

4. **Propulsion and Manoeuvrability - Advantage Enterprise D**

(a) *Imperial Star Destroyer*

The ISD is powered by a 200 Trillion GW reactor. Each ISD is equipped with both hyperdrive (to achieve light speeds) and a sub-light speed propulsion system.

Due to finely tuned internal calibration and damping, the hyperdrive of an ISD can accelerate the vessel past the speed of light with almost no hassle to the crew.<sup>12</sup> Although never explicitly stated, rough calculations put the maximum speed of an ISD between 10 million and 100 million c.<sup>13</sup>

At sub-light speeds the ISDs are powered by seven (7) thrust nozzles that accelerate ionized particles to relativistic speeds to accelerate the ship. There are three (3) main nozzles that are used for normal propulsion and four (4) auxiliary nozzles that are lit during combat situations.

Although the ISD has considerable speed capabilities its agility is considerably poor. In the chase from Hoth in the *Empire Strikes Back*, there is a near collision between two ISDs that barely managed to manoeuvre to avoid each other.

(b) *Enterprise D*

The Enterprise D is powered by a matter/antimatter fuelled warp drive and has two warp nacels which drive the ship up to a maximum of Warp Factor 9.6,<sup>14</sup> which is equivalent to approximately 2000 c.

At sub-light speeds the Enterprise D is capable of manoeuvring at varying speeds under impulse power. The Enterprise D is a versatile warship and has many times over proven herself in battle. The Enterprise D does not appear to be in any way limited in her ability to perform complex tactical manoeuvres in battle.

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<sup>12</sup> Compare that of the *Millennium Falcon*, where passengers have to hold on for the jump to light speed.

<sup>13</sup> In this context “c” refers to the speed of light, roughly  $3.0 \times 10^8$  m/s, and *not* a Cochrane which is a unit of speed from Star Trek named after Zefram Cochrane the first inventor of a functional warp engine.

<sup>14</sup> Maximum warp can only be sustained for a period of 12 hours.

5. **Manpower - Advantage ISD**

(a) *Imperial Star Destroyer*

The standard crew compliment on both Type I & II ISDs is 37,000 crewmen. Additionally, there is a full regiment of 9,700 stormtroopers on board.

(b) *Enterprise D*

The Enterprise D carries a standard compliment of 185 officers, 575 crew, and approximately 252 civilians.

6. **Other Relevant Ship Comparisons**

(a) *Imperial Star Destroyer*

An ISD carries an entire wing (72) of starfighters: three squadrons of TIE fighters, two squadrons of TIE interceptors, and one squadron of TIE bombers.

In addition to the almost ten thousand stormtroopers, the ISD also carries 20 AT-AT walkers, 30 AT-ST walkers, eight (8) lambda class shuttles, fifteen (15) stormtrooper transports and five (5) assault gunboats.

(b) *Enterprise D*

The Enterprise D carries an assortment of shuttlecraft. However, shuttles are not very useful in battle situations.

The Enterprise D is capable of performing a saucer-separation in which the stardrive section of the ship is separated from the saucer. In battle situations this can have two purposes. Firstly, the separated saucer section can flee to protect non-essential personnel. Secondly, the separation be used as a battle tactic to create a diversion, or to engage the enemy from two fronts.

A saucer separation was successfully used against the Borg to create a diversion, which enabled an away team to recapture Capt. Picard.<sup>15</sup>

## CONCLUSIONS

### *Factors Supporting the ISD*

It is clear that the ISD is a far more powerful starship. Its main purpose is that of war, and it is armed specifically for that function. It out-powers the Enterprise D in every aspect of comparison. Furthermore, should the engagement turn into some form of ground battle the

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<sup>15</sup> [http://www.memory-alpha.org/en/wiki/Saucer\\_separation](http://www.memory-alpha.org/en/wiki/Saucer_separation)

stormtroopers and AT walkers could clearly overrun any Federation ground force that the Enterprise could muster. The full wing of starfighters on board the ISD would also wreak havoc on the Enterprise D during a battle.<sup>16</sup>

*Factors Supporting the Enterprise D*

Being a smaller and more agile vessel, the Enterprise D may only stand a chance in such a fight by avoiding the large guns of the ISD. Separating the saucer section will give the Enterprise a tactical advantage only if the TIE squadrons are not involved.

It should also be noted that in science fiction it is almost canon that *good triumphs over evil*. Additionally, the crew manning the Enterprise D, although smaller in number and not as battle ready, has more than proven themselves in battle situations. The senior staff of the Enterprise D are thinkers, not warriors,<sup>17</sup> and have defeated technologically superior adversaries before.

The Enterprise D's transporters systems are unique and could prove to be useful. A small away team could beam aboard the ISD and perhaps disable the ship from the interior, or at very least disable the ship's shields. If the transporter system is unable to penetrate the ISD's shield, the crew could be beamed into a TIE fighter, which does not have its own shield, and then pilot the fighter back to the ISD.

*In the End?*

Although there are many novel ways that it is *possible* that the Enterprise D could be victorious, if the question is as basic as who would win a contest based purely upon the two vessels firing upon one another, **then the ISD would swat the Enterprise D like a fly.**

CBY/cby

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<sup>16</sup> Although it is unclear if in this particular comparison the on-board complement of star fighters is to be taken into consideration.

<sup>17</sup> Except for perhaps Lt. Worf.