

Spaceflight in TGO

Spaceflight Tech

"Any sufficiently advanced technology is indistinguishable from magic."

-- Arthur C. Clarke

Interstellar Space Flight

There are several basic steps in CAA approved interstellar space flight.

1. Get clearance if in a restricted area.
2. Maneuver to a suitable jump point in a low gravity area.
3. Plot a navigation course.
4. Execute an interstellar jump to the outskirts of the target system. (The drives are not accurate enough to safely jump near massive objects.)
5. Recharge jump capacitors. (This usually takes 30 minutes, 15 for high-performance or military craft).
6. Plot a micro-jump course to a safe spot near the target object.
7. Execute an in-system micro-jump.
8. Maneuver on sub-light systems to the desired target object.

Drive Systems

There are several means of moving objects through space within the realms of TGO.

Gravitic Drives

Gravitic drives are the most common means of moving objects through local space.

Gravitic drives utilize a drive rail that is composed of a sheath surrounding a neutronium monofilament. That molecular-width string is able to generate and conduct gravity waves at any point in normal space, providing thrust directionally along the

length of the rail. Both forward and reverse thrust can be applied equally.

Pitch, yaw, and roll are controlled by four-spoked wheel composed of smaller drive rails.

Drive rails are extremely expensive, and typically account for at least half of the cost of a ship.

Most civilian ships, like the CIS Daisy, have a single drive rail. Military ships have either dual or triple rails, both for redundancy, and to make them more agile. (Subtle course corrections can be applied by modifying the power in paired or triple rails.)

The disadvantages of gravitic drives are:

- They are very expensive.
- They are less powerful than some other forms of reaction drives.
- They only work in normal space.

The advantages of gravitic drives are:

- They are solid state, and require zero maintenance unless damaged.
- They do not require any fuel.

Plasma Reaction Drives

When you need to go faster than a gravitic drive can push you, or escape higher gravity, you can slap plasma rockets onto your spaceship. They are not very efficient, and are only useful for short trips.

Military missiles use plasma drives or even conventional chemical rockets because they have to outrun their targets and because gravitic drives are far too expensive to throw away.

Maneuvering Thrusters

Most ships have secondary maneuvering thrusters that simply use compressed gas to alter the ship's angle of attack. They are intended for emergencies only, and typically only have enough fuel for a minute or less of constant use, and they only generate about 0.1 G acceleration, enough to nudge a ship.

Jump Drives

Sometimes called “hyper-drives,” “wormhole drives,” or “Hilbert drives,” jump drives fold space to create a wormhole between distant points in space, allowing almost instantaneous travel between two points.

Jump technology was licensed from the Zimrakans, who shared some of their secrets with the Confederation in exchange for a royalty on each jump drive manufactured.

Mis-Jumps

Interstellar jumping is extremely hazardous. Ships are constantly lost, sometimes without explanation. About one in every thousand jumps result in the destruction or disappearance of the vessel. The larger the ship, the more vulnerable it is to mis-jumping. Therefore, very few Confederation ships exceed 3,000 displacement tons.

There are several limiting factors on hyperspace jumps.

Gravity interferes with the targeting, making it very dangerous to perform interstellar jumps while in a gravity well.

Jump Drive Maintenance

C.A.A. regulations require that jump drives be replaced after every 100 jumps. This is because the very act of warping space to create a wormhole actually causes the drive itself to warp, very subtly, at a molecular level. Over time, this decreases jump accuracy, and by extension, safety.

It is easy to refurbish a drive for about 1/10th the cost of a new one. However, this work cannot be done in the field. It requires a factory facility.

A Typical Sortie

Ledge radioed into the traffic controller, “CIS Daisy to Control. Requesting jump clearance.”

“Affirmative, CIS Daisy. Jump point coordinates are uploaded to your nav computer.”

“Did you get the coordinates, Jonesie?”

Jones replied, “Yep. They look okay.”

“Amy, please move us to the coordinates.”

Amy, the ship’s AI computer, replied, “Affirmative. Course plotted, engaging gravitic drive.”

Koko asked, “Who’s up for a quick viewing of *Seven Samurai* while we wait?”

About Four Hours Later...

Amy announced, “We have arrived at the designated jump point.”

Ledge barely stirred. “All yours, Jonesie.”

Koko added, likewise half-asleep, “If Starbuck’s has a fly through, it’s okay to jump there.”

Jones staggered into the cockpit and took his seat. “Amy, plot a cometary jump to Tau Ceti.”

After a brief pause, Amy replied, “Course plotted. Please confirm it.”

Jones pulled the course projection up on his monitor and decided it was fine. “Run with it.”

“Affirmative. Interstellar hyperspace jump will occur in one minute. Please strap in.”

With a flash, the CIS Daisy punched a hole in space and traveled almost instantaneously from Earth to the comet belt of Tau Ceti.

Amy declared, “Jump successful. Recharging jump capacitors. ETA fifteen minutes until we are ready for another jump.”

Jones said, “Now plot us a microjump to the Tau Ceti V incoming vessel target area.”

Amy said, “Course plotted. Please confirm it.”

Jones said, “I trust you.”

Ledge said, “Jump us when we’ve recharged.”

Koko asked, flatly, “Then another four-plus hours flying in from the jump point?”

Jones said, “Has anyone seen *Gone with the Wind* yet?”