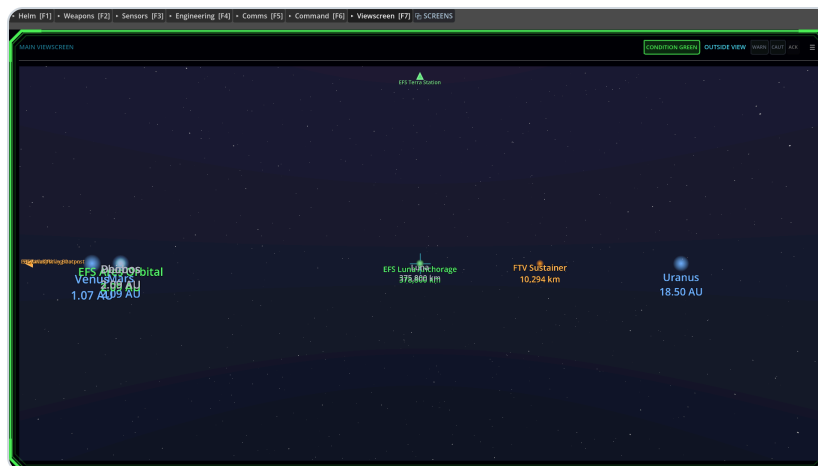


DARKHELM

OPERATIONS MANUAL

TERRAN NAVY · EARTH FEDERATION — Bureau of Ships

RESTRICTED — Operational Use Only



1. Volume I — Ship Operating Manual (SOM)
2. Part PRO-ABN — Abnormal & Emergency (ESMS Drills)
3. Volume II — Quick Reference Handbook (QRH)
4. Volume III — Crew Handling Manual (CHM)
5. Volume IV — Minimum Equipment List (MEL)
6. Volume V — Technical & Ordnance Catalog (TEC)

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DARKHELM OPERATIONS MANUAL

Ship Operating Manual — Volume I (SOM)

TERRAN NAVY · EARTH FEDERATION — Bureau of Ships Applicable to: all crewable classes (generic).
Reference fit: **PC-class Corvette** *Darkhelm* (PC-1187).

Document	TN-SOM-001
Revision	0
Classification	RESTRICTED — Operational Use Only

Foreword — How to use this manual

This manual describes the ship's systems and the procedures to operate them. It is **generic**: the body applies to every crewable class because all ships share one power, thermal, flight, sensor, combat and **ESMS** model. Class-specific values (limits, equipment fit, whether Flight Ops is installed) live in the **Ship Data Sheets** (Volume V, TEC). Where a system is fitted only to some ships, an **applicability banner** says so.

The companion **Quick Reference Handbook (QRH)** carries the condensed checklists for use at the console. This SOM carries the expanded procedures and the *why*.

Conventions

WARNING — A procedure or condition that, if not observed, may lead to loss of the ship or crew.

CAUTION — A procedure or condition that, if not observed, may lead to damage to equipment.

NOTE — Information that aids understanding or eases a task.

ESMS alert-colour philosophy (Volume I, DSC-31). The ship monitors itself and annunciates faults on the ESMS, exactly as it does in flight:

Colour	Level	Meaning	Crew response
RED	Warning (L3)	Immediate threat to ship/crew	MASTER WARN — act now, run the drill
AMBER	Caution (L2)	Significant fault, time available	MASTER CAUT — run the drill
CYAN	Advisory / Memo (L1)	Status / reminder	Monitor
GREEN/WHITE	Normal	System nominal	—

NOTE The ship **monitors itself**: when a fault occurs the ESMS **annunciates the alert and presents the drill**, and the crew works the actions to completion (to – STATUS – , then reviews the inoperative systems). Memory (recall) items are kept to a minimum and are boxed where they exist.

(List of Effective Pages and Revision Record at front of binder.)

PART LIM — LIMITATIONS

NOTE Flight and electrical limits are **per-class** — the figures for every class are tabulated in the Ship Data Sheets (Volume V). The example values below are for a PC-class Patrol Corvette.

LIM-01 Flight envelope (example — PC-class)

Limit	Value
Max impulse speed	200 km/s
Max acceleration	0.4 (rated)
Max heading (yaw) rate	20 °/s
Max pitch rate	15 °/s
Max roll rate	30 °/s

NOTE Sub-light speed is shown in **km/s** (the cockpit reads **m/s** below 1 km/s, e.g. on the final docking approach). Attitude rates are in degrees per second.

LIM-02 Hyperdrive

Hyperspace speed is set by the hyperdrive **power factor**. Engaging the drive requires Main-bus supply (see DSC-24 / DSC-33). The factor→speed schedule is published in DSC-33.

LIM-24 Electrical

Limit	Value / rule
Power tiering	MAIN >> A/B >> EMERGENCY (orders of magnitude)
Source output ceiling	Rated output × integrity (a damaged source delivers less)
Reverse ties EMER→A / EMER→B	Battery-drain path; start/blackout use only , then open

Limit	Value / rule
Critical loads (life support, consoles)	Never breaker-tripped; on EMERGENCY bus
Battery recharge	Resumes only below 98 % (hysteresis)

LIM-21 Life Support

Atmosphere fails after about 180 s of sustained crisis O₂/CO₂. Keep a scrubber powered.

Alert conditions

Condition	Label	Meaning / posture
GREEN	CONDITION GREEN	Normal operations
YELLOW	LEVEL 2 BATTLE STATIONS	Potential / unidentified threat — shields up
RED	LEVEL 1 BATTLE STATIONS	Hostile contact confirmed — weapons up and shields up

PART DSC — SYSTEMS DESCRIPTION

NOTE Systems are described generically; the equipment *fit* (numbers, marks) differs by class — see the Ship Data Sheets (Volume V) and the Catalog (Volume V, TEC).

DSC-21 LIFE SUPPORT

The life-support plant maintains the crew atmosphere — oxygen, pressure and CO₂ — throughout the ship. Oxygen is drawn from reserve and regenerated; CO₂ is removed by scrubbers whose capacity scales with the power and integrity allocated to them. A hull breach vents the affected compartment; the system seals automatically at a pressure threshold and the atmosphere is then rebuilt from reserve. Life support is a **critical** load on the emergency bus and is never load-shed. Sustained crisis oxygen or CO₂ becomes life-threatening in about three minutes — keep a scrubber powered and seal breaches promptly. Monitored on the Life Support display and by the ESMS (O₂ RESERVE LOW, CO₂ SCRUBBER, DECOMPRESSION, LIFE SUPPORT FAILURE).

DSC-23 COMMUNICATIONS

Two means of communication: **in-system radio** — effectively instantaneous within a star system — and **subspace** — interstellar, with a light-delay. In-system radio carries hailing, channel traffic, station services while docked, and crew coordination. The **subspace transceiver** (a main-bus system, unallocated by default) carries delayed text and stored-voice traffic between star systems, limited by the transceiver's

range. Every ship broadcasts a **transponder** (faction and identity); IFF interrogation and registry checks verify a contact's claimed identity. Comms is a critical load on the emergency bus.

DSC-24 ELECTRICAL POWER

24-00 General

The ship runs a **four-bus power grid** that every other station depends on — impulse engines, hyperdrive, shields, weapons and sensors are all power consumers. Power is tiered by orders of magnitude:

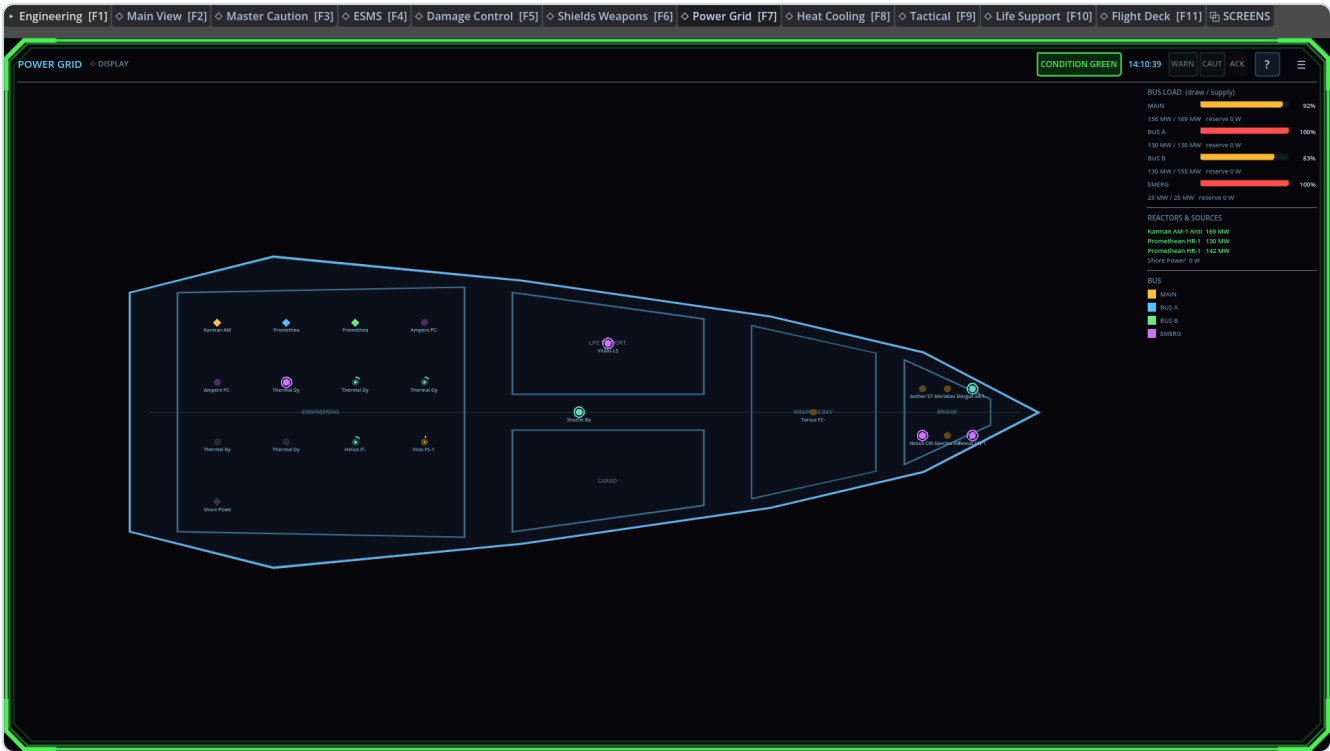
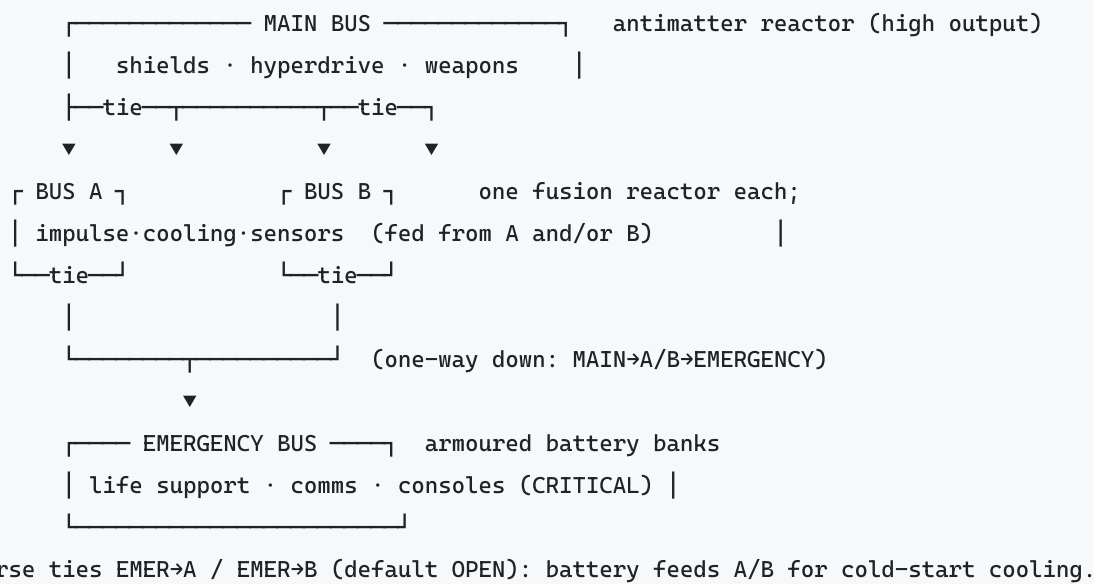


Figure 24-1 — Power Distribution panel (Engineering).

24-10 Power sources

Source	Bus	Role	Notes
Antimatter core(s)	MAIN	Primary, high output	Critical — never shed; consumes antimatter (long endurance); produces heat — requires loop cooling
Fusion reactors	A / B	Auxiliary	One or more per side, by class; burn deuterium; produce heat — require loop cooling
Battery banks	EMERGENCY	Reserve / start	Charge from the emergency bus; latch full at capacity
Shore power	A/B	Dockside	Energizes when docked AND maintenance power is requested (Comms → Station Services); feeds A/B only — never MAIN ; no heat; idles the reactors under AUTO BALANCE

NOTE The number of reactors, battery banks and coolant units **differs by class** (see the Ship Data Sheets, Volume V). The architecture is common to all: an antimatter core on MAIN, fusion reactors on A and B, battery banks on EMERGENCY.

Full equipment specifications: Volume V (TEC).

24-20 Buses & ties

Each source and consumer sits on a bus and may be reassigned to the buses available to it. **Bus ties** push a bus's surplus downstream: MAIN→A, MAIN→B, MAIN→EMERGENCY (and A→EMERGENCY / B→EMERGENCY). Two **reverse** ties, EMER→A and EMER→B, are **normally OPEN** and exist to let the battery feed A/B during a battery (no-shore) start.

CAUTION Holding a reverse tie (EMER→A/B) drains the battery quickly and raises the ESMS **EMER BUS → A/B** caution. Open it once the fusion reactors carry their buses.

24-30 AUTO BALANCE

AUTO BALANCE trims each source's output to its bus demand, and when docked draws shore power first and idles the reactors. Run it **OFF** during a manual start (sources commanded by hand), then **ON** for normal operations.

24-40 Breakers & bus protection

- **Latched breakers** zero a consumer's draw and **reset only by hand at the panel**. A reset returns the element **OFF** (a source returns with its supply breaker open) so it cannot snap back and re-trip; critical consumers reset straight back on.

- **Bus overload:** sustained negative reserve trips every non-critical consumer, feeding source and tie on that bus. Critical loads (life support, consoles) are never tripped.

24-50 Controls & indications (Engineering)

The Engineering power panel provides, per source and consumer:

Control	Function
Source ON/OFF	Bring a reactor or battery on or off line
Source output	Set a reactor's commanded output
Bus selector	Assign a system to a bus
Bus-tie switches	Open/close each interlock
Battery charge	Enable / inhibit battery recharge
AUTO BALANCE	Automatic source-to-demand trim
Breaker reset	Re-close a tripped breaker
Power allocation	Budget power to each consumer
Presets (× 10)	Save / recall the whole power configuration

Indications: per-bus supply, draw and reserve; per-source output and on-line state; per-consumer power **used vs. assigned**. The **Power Distribution** and **Heat & Cooling** repeater displays mirror these for the whole bridge.

DSC-26 DAMAGE CONTROL

Hull, armour and every system carry an integrity rating. In combat, damage passes **armour** → **hull** → **systems** once a shield facing is down; overheating damages systems internally. The Damage Control panel assigns **repair crews** to the hull, armour or a system; repair takes time and consumes spare parts. A destroyed or overheated system must be **repaired and have its breaker reset** to return. Hull, armour and system integrity are shown on the Damage Control display and annunciated by the ESMS (HULL DAMAGE/BREACH, ARMOUR LOW, SUBSYSTEM DAMAGE).

DSC-27 FLIGHT CONTROLS — HELM

The ship manoeuvres in six degrees of freedom under the impulse engines. Helm commands **rates** — yaw, pitch and roll about the ship's own axes — together with longitudinal throttle and lateral/vertical thrust; the ship flies relative to its own attitude, so a banked turn pulls the nose round like an aircraft. Thrust and rotation are proportional to the power delivered to the engines: at idle the drive sips power, worked hard it draws its full allocation, and with effectively no engine power the ship is adrift — no thrust and no rotation. Sub-light speed is shown in km/s (m/s below 1 km/s, e.g. the final docking creep). Attitude is presented on the forward HUD and the attitude director.

DSC-28 FUEL

The ship carries two fuels: **antimatter** for the main core and **deuterium** for the fusion reactors (the hyperdrive also draws fuel in flight). Antimatter endurance is long — on the order of a week of running. Stores and burn rates are shown on the Fuel panel; a docked ship resupplies through station services. Low stores raise the ESMS FUEL LOW alert; at exhaustion the affected source or drive stops.

DSC-31 INDICATING / ESMS

The **Electronic Spaceship Monitoring System (ESMS)** continuously monitors every system and annunciates faults by priority. A **WARNING** (red) demands immediate action and lights the master warning; a **CAUTION** (amber) lights the master caution; advisories and status memos are shown for awareness. For each active fault the ESMS presents the **drill** — the action list the crew works to STATUS (Part PRO-ABN). Master warning/caution lights and an acknowledge control appear at every station; the full display is on the Comms and Command consoles and a dedicated read-out. Colour philosophy: red = warning, amber = caution, cyan = advisory, green/white = normal.

DSC-33 HYPERDRIVE / FTL

Faster-than-light travel is by the hyperdrive, which requires Main-bus supply. The **power factor** (1–9) sets transit speed: a higher factor is faster but draws more power and loads the drive's cooling loops. Engaging the drive spools a hyperspace field; the ship then transits and reverts at the destination. Holding the field adds heat to the drive loops that bleeds off over a short cool-down after dropout. A gravity well or interdiction field blocks engagement (ESMS FTL INTERDICTED). **Reverting inside a body is fatal** — confirm the course is clear. Normal jump procedure: Part PRO-NOR.

DSC-34 SENSORS & NAVIGATION

The sensor suite builds the tactical picture: a **passive** watch at shorter range and an **active** scan at longer range that also classifies contacts. Detection and classification range and rate scale with the power and integrity allocated to sensors. Contacts are tracked, classified by type and allegiance, and shared with friendly ships over the **datalink**; active illumination ("painting") supports weapon guidance.

Navigation reference

Position is given relative to the system's star as **Bearing / Mark / Range** — bearing and mark are angles about the star, range is distance (km close in, AU at system scale). Sci-fi cardinals orient the crew: **Coreward (COR)** toward the galactic core, **Spinward (SPI)** with galactic rotation, **Rimward (RIM)** toward the rim, **Trailing (TRA)** against rotation. Courses are set to bodies or waypoints and executed by Helm.

DSC-39 ELECTRONIC WARFARE

The electronic-warfare suite (ECM) is a main-bus system, unallocated by default. Powered, it offers several modes — jamming, deception/decoy and counter-measures — that degrade hostile locks and missile seekers at the cost of its own emissions and power draw. Against hostile jamming, counter-counter-measures restore the sensor picture. See also DSC-34 and the countermeasures catalog (Volume V).

DSC-44 WEAPONS / FIRE CONTROL

Three weapon families: **beam** weapons (cannons, pulse lasers, lances) that fire on a charge cycle; **missiles** launched from tubes, including dedicated **nuclear** tubes; and **point-defence** that engages inbound missiles. Engagement requires a **lock**; hit probability depends on accuracy against the target's aspect and range, and active illumination from Sensors improves missile guidance. Weapon output and charge time scale with the power allocated to weapons. Nuclear release follows a multi-station authorisation (Command). The defensive layers — shields, armour, hull — are described in DSC-56 and DSC-26.

DSC-45 SMALL CRAFT & FLIGHT OPERATIONS

Applicability: ships fitted with a strike-craft hangar (carriers and hangar-equipped classes).

Carriers and hangar-equipped ships operate small craft — fighters, bombers and shuttles — from a hangar deck through the **Flight Operations** station: launch and recovery, rearm and refuel, and the wing's orders are managed there. Flight operations are **power-gated** — the bay must be powered to cycle craft — and craft service (rearm/refuel) runs while a craft is docked in the bay, scaling with bay power. Non-carrier classes may still carry a utility shuttle from a small bay.

DSC-56 SHIELDS

Shields protect the ship over **six facings** — fore, aft, port, starboard, dorsal and ventral. Each facing absorbs fire until depleted, then regenerates when not under fire; a collapsed facing exposes armour and hull on that arc (ESMS SHIELD FACING DOWN). Shield strength and regeneration scale with the power allocated to shields — under-powered shields regenerate slowly and hold less (SHIELDS UNDER-POWERED). Absorbing fire heats the shield bubble; sustained heating reduces effectiveness and can damage the generator. Manage facings toward the threat and let them recover when fire slackens.

DSC-71 POWER PLANT — REACTORS & COOLING

Power is generated by an **antimatter core** on the main bus and **fusion reactors** on buses A and B (one or more per side, by class), with **battery banks** on the emergency bus. Sources spool to their commanded output and are capped by integrity. **All reactors — antimatter and fusion — produce heat and require loop cooling.**

DSC — Bridge Repeater Displays

The image displays a complex digital interface for a Star Wars: The Force Awakens bridge simulator. At the top, a navigation bar contains 12 tabs: Engineering [F1], Main View [F2], Master Caution [F3], EMS [F4], Damage Control [F5], Shields Weapons [F6], Power Grid [F7], Heat Cooling [F8], Tactical [F9], Life Support [F10], Flight Deck [F11], and SCREENS. The main display area is titled 'HEAT & COOLING' and features a large, dark blue ship layout with various systems labeled. On the right side, a 'CONDITION GREEN' status bar is visible, along with a list of coolant loops (Loop A, Loop B, Emergency) and a detailed 'SYSTEM HEAT' table showing temperatures for various components like Kaminus Aft, Antares PC, and various thermal dynamics. The ship layout includes sections for ENGINEERING, LIFE, CARGO, and various support systems like Medical, Security, and Maintenance.

Figure 71-1 — Heat & Cooling display (coolant loops, pumps, radiators).

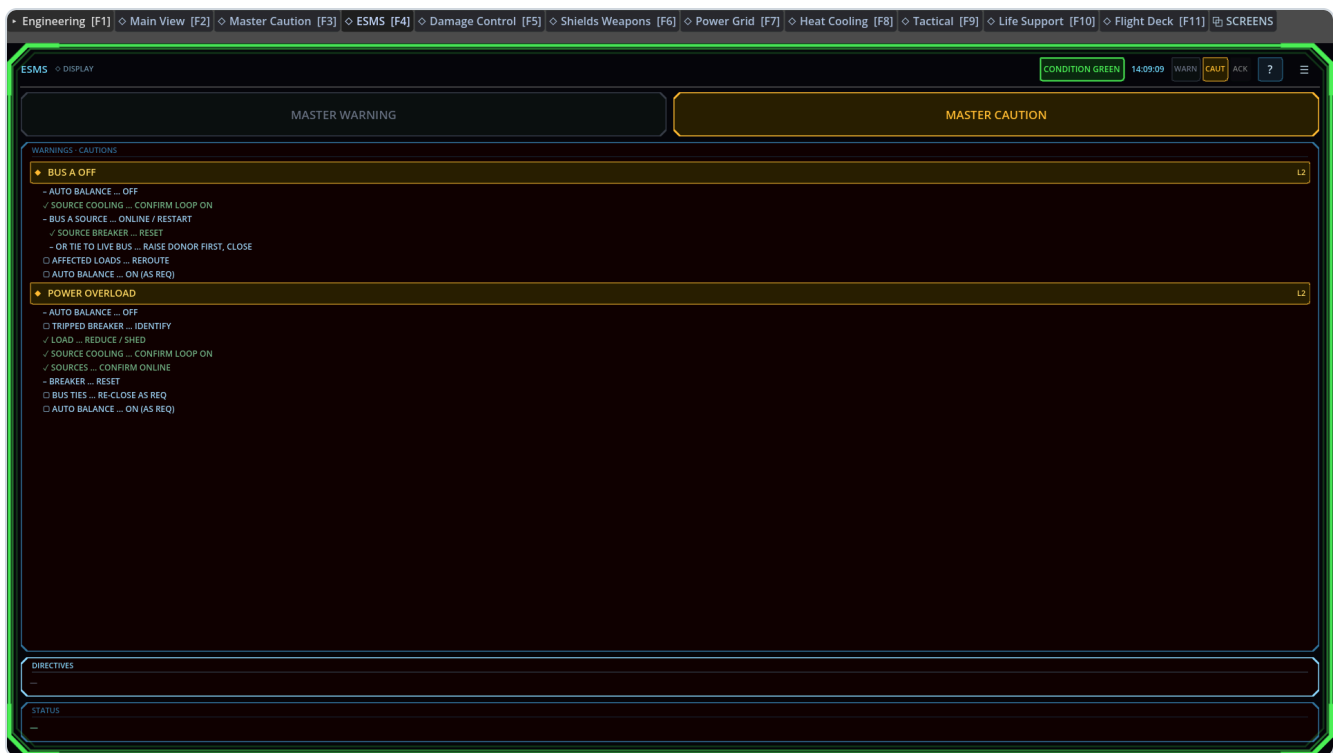


Figure 31-1 — ESMS display (active alerts and their drills).

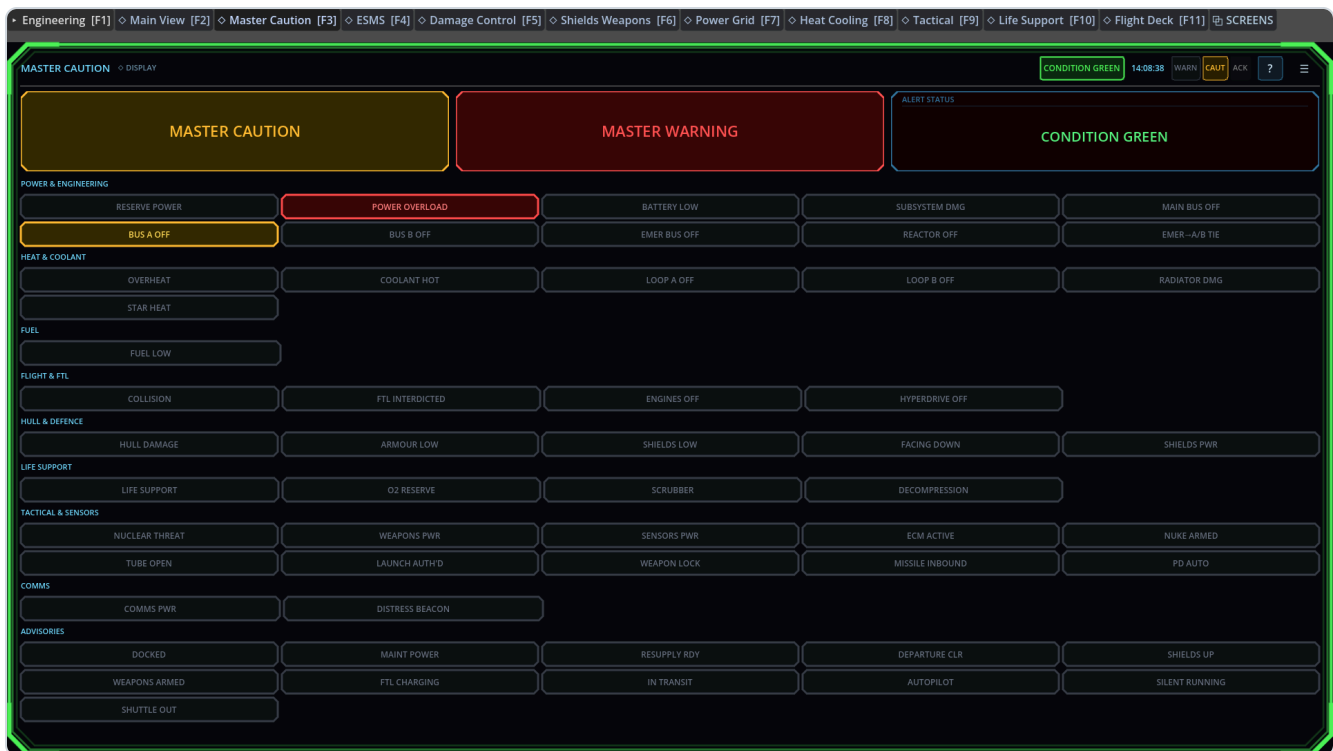


Figure 31-2 — Master Caution annunciator panel.

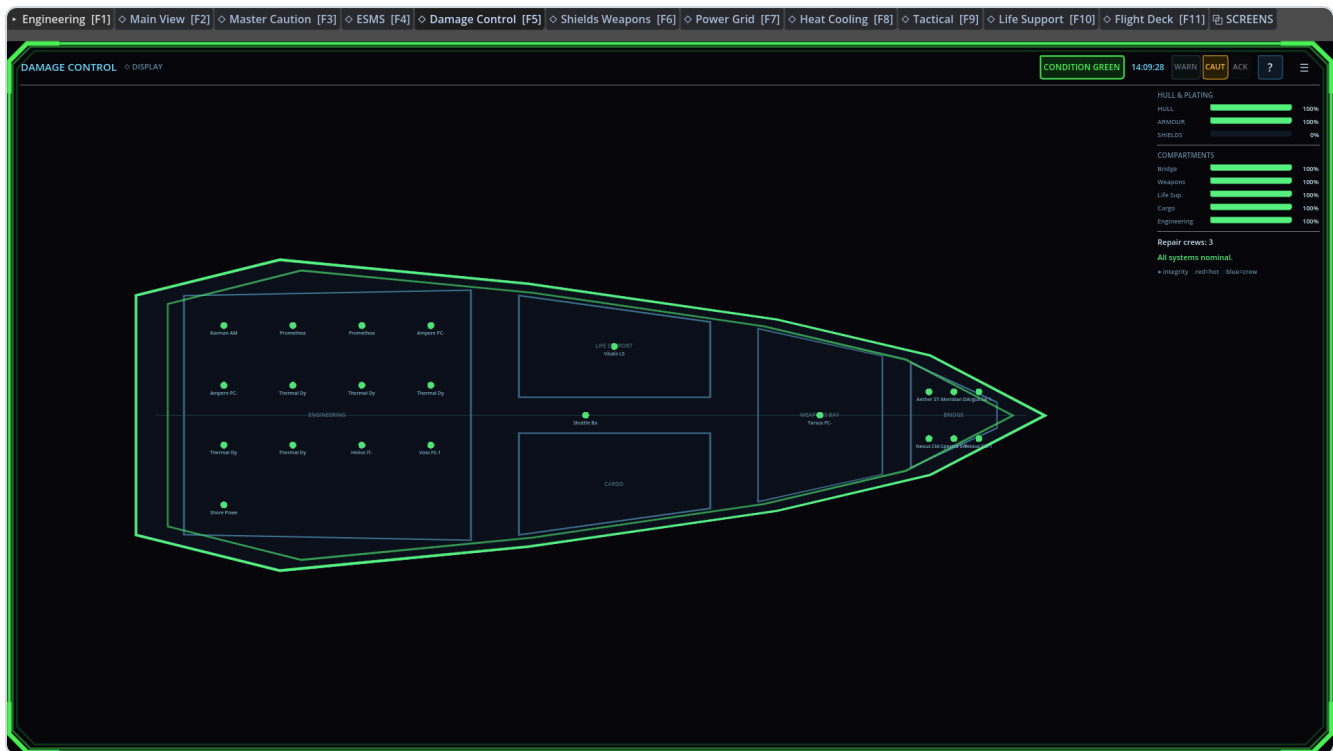


Figure 26-1 — Damage Control display (hull / armour / system integrity).

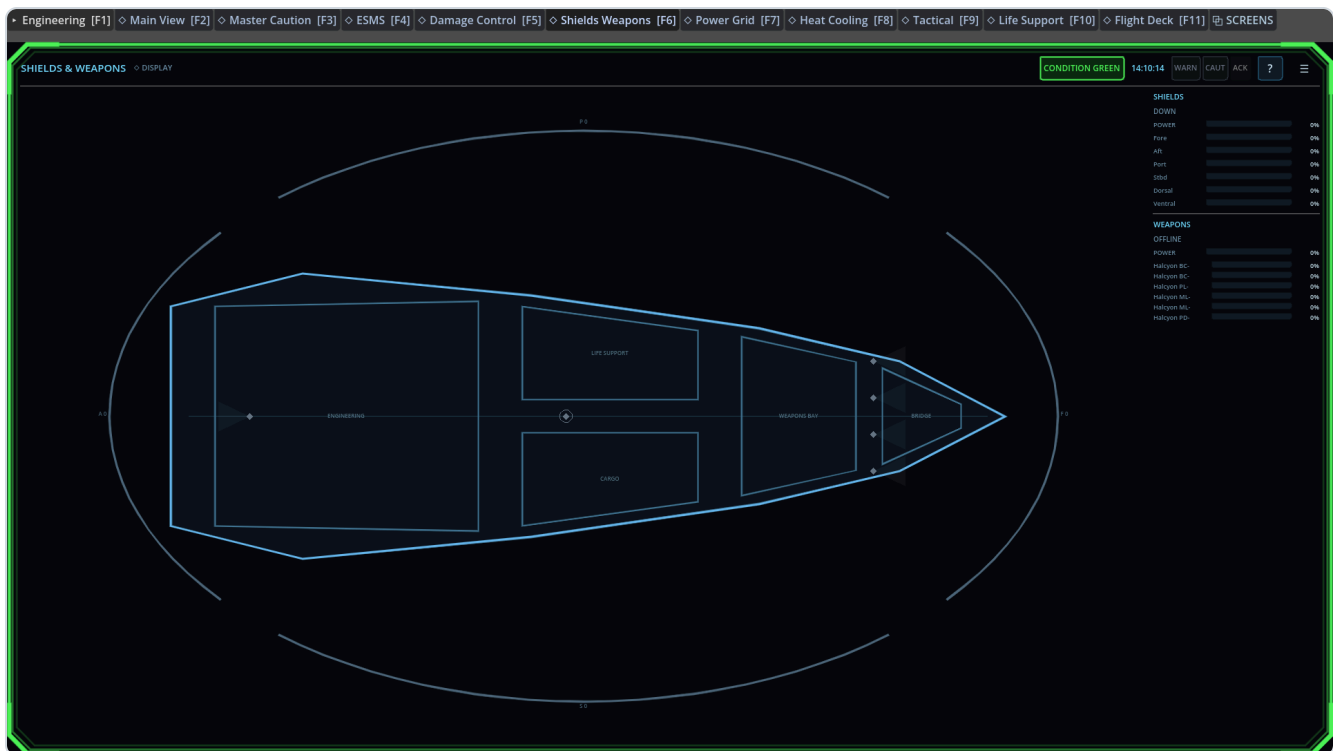


Figure 56-1 — Shields & Weapons status (six facings, mounts).

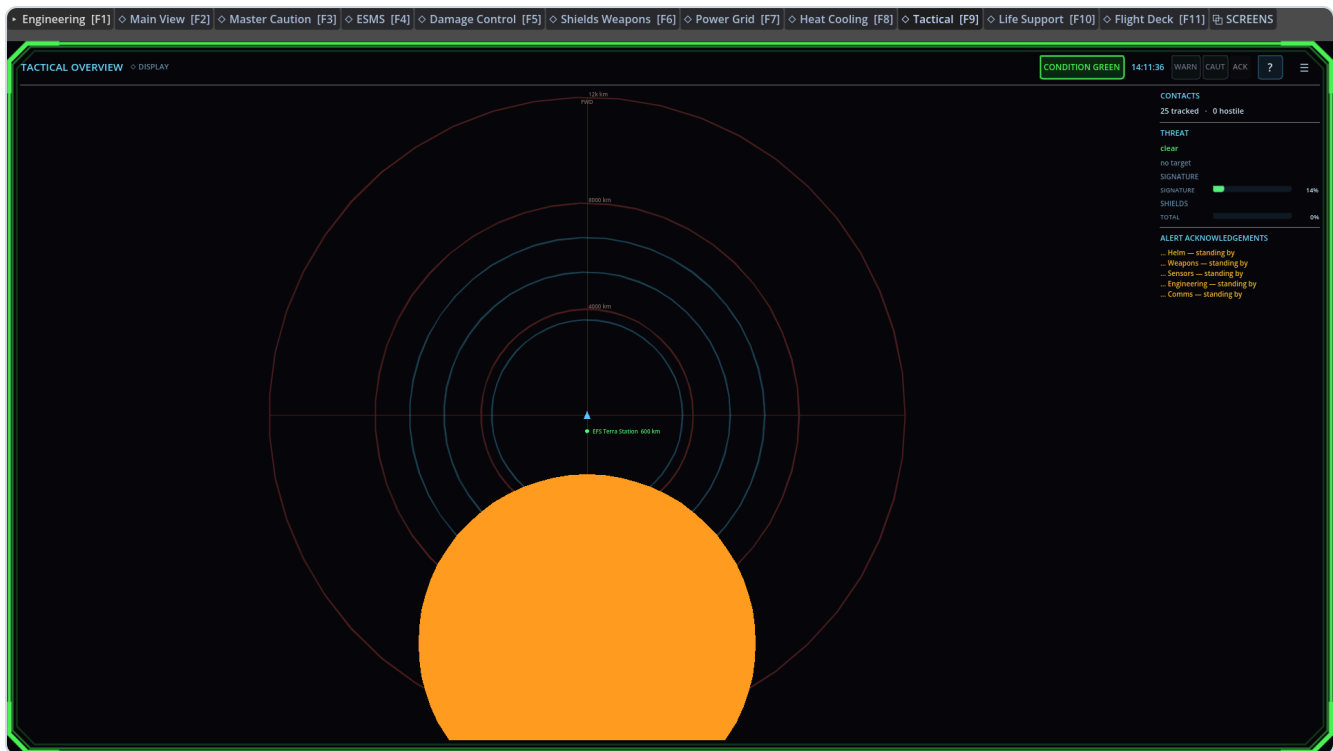


Figure 34-1 — Tactical plot (the sensor picture).

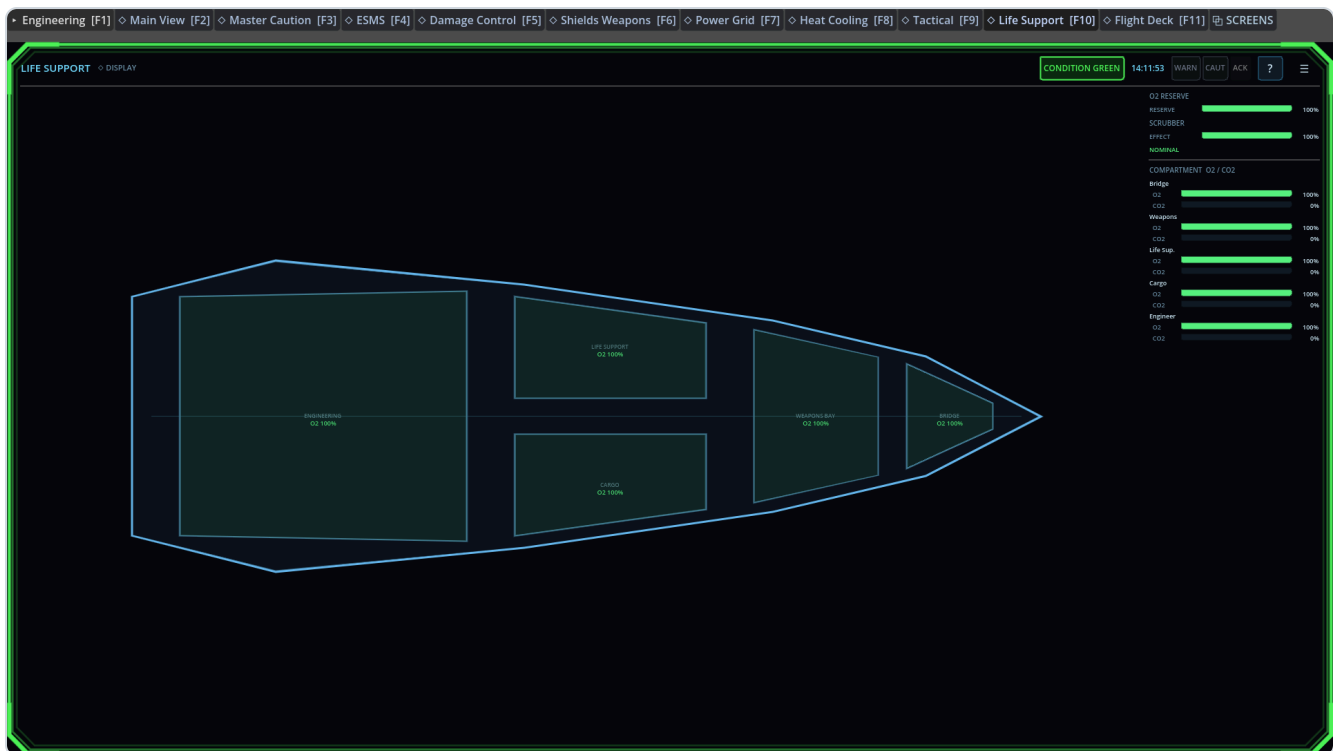


Figure 21-1 — Life Support display (atmosphere, scrubbers).

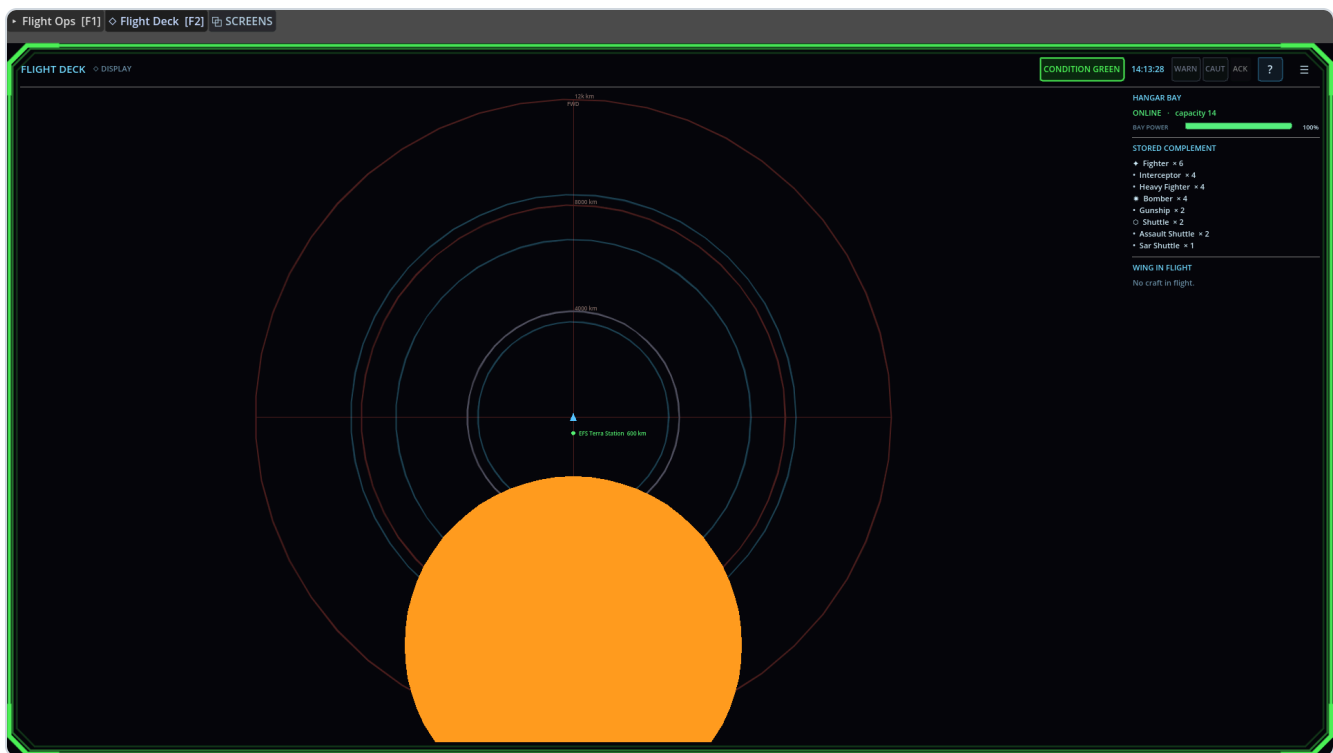


Figure 45-1 — Flight Deck display (carrier-fitted ships).

PART PRO-NOR — NORMAL PROCEDURES

NOTE The expanded procedures below carry the full flow and the *why*; the condensed challenge-response forms are in the **QRH**.

PRO-NOR COLD START — NORMAL (at the dock, on maintenance power)

The normal start is done **docked, with station maintenance (shore) power available**. Maintenance power energizes buses **A and B** while the reactors are still cold, so the start is unhurried.

Initial state: docked; reactors cold (offline); the **EMERGENCY bus is alive on battery** (consoles + life support powered).

CAUTION Maintenance/shore power feeds buses **A and B only — never MAIN**. Main-bus loads (shields, hyperdrive, weapons) stay unavailable until the **antimatter reactor** is online (step 3).

1 — MAINTENANCE POWER

Challenge	Response
Dock	CONFIRM SECURE
Maintenance power	REQUEST (<i>Comms → Station Services</i>) — shore energizes A/B
Buses A / B	CONFIRM UP (<i>shore; ≈ idle hotel load</i>)
Emergency bus	CONFIRM ALIVE (<i>battery</i>)

2 — COOLING

Challenge	Response
Cooling loops A / B	ON
Cooling	AUTO
Loop cooling	CONFIRM RUNNING

3 — REACTOR START

Challenge	Response
Fusion reactor A	ONLINE — allow to spool
Fusion reactor B	ONLINE — allow to spool
Antimatter reactor (MAIN)	ONLINE — allow to spool
Sources	CONFIRM ONLINE & SPOOLED (<i>output risen</i>)
Bus MAIN	CONFIRM UP (<i>antimatter on line</i>)

4 — AFTER START

Challenge	Response
AUTO BALANCE	ON (<i>docked: draws shore first, idles the reactors</i>)
Battery charge	ON
Cooling	AUTO — CONFIRM

5 — PRE-DEPARTURE

Challenge	Response
Power allocation	SET shields / impulse / sensors / weapons — or RECALL a preset
ESMS	NO WARNING / NO CAUTION

6 — DEPARTURE (transfer to ship power)

CAUTION Transfer each bus to its reactor **before** dropping shore power. Releasing maintenance power onto a reactor that is not yet tied to the bus with its output up to carry the load will trip the bus.

Challenge	Response
Reactors A / B (and MAIN)	CONFIRM TIED TO BUS (<i>each reactor on its bus</i>)
Reactor output	UP TO CARRY THE BUS (<i>supply $\geq$ bus load before transfer; AUTO BALANCE assists</i>)
Maintenance power	RELEASE — open the shore-power breaker (<i>only now that the reactors hold A/B</i>)
Buses A / B / MAIN	CONFIRM UP ON SHIP POWER (<i>no breaker trip</i>)
Undock	AS REQUIRED

☐ **COLD START COMPLETE** — ship operational on its own power.

NOTE — ABNORMAL (no maintenance power) cold start. Away from a dock, or with shore power unavailable, start on the **battery**: AUTO BALANCE **OFF**; close the reverse ties **EMER** → **A** and **EMER** → **B** to run the cooling pumps off the battery (expect the ESMS **EMER BUS** → **A/B** caution); light the fusion reactors, then the antimatter reactor; once A/B are carried, **OPEN** the reverse ties and bring AUTO BALANCE **ON**. This battery start is filed as an abnormal procedure (PRO-ABN).

PRO-NOR SECURING — FULL SHUTDOWN (at the dock)

The normal shutdown is the reverse of the start and is done **docked, on maintenance power**, so shore carries the hotel load while the reactors come down to cold.

Initial state: operational, returned to the dock.

1 — DOCK & MAINTENANCE POWER

Challenge	Response
Dock	CONFIRM SECURE
Maintenance power	REQUEST (<i>Comms → Station Services</i>)
AUTO BALANCE	ON (<i>shore-first — shore takes the A/B load</i>)

2 — STOP REACTORS

Challenge	Response
Main-bus loads (shields / weapons / hyperdrive)	OFF / DEALLOCATE

Challenge	Response
Antimatter reactor (MAIN)	OFFLINE
Fusion reactors A / B	OFFLINE <i>(shore now carries A/B)</i>
Sources	CONFIRM OFFLINE

3 — COLD & DARK

Challenge	Response
Cooling	OFF <i>(as required)</i>
Maintenance power	RELEASE <i>(buses A/B go cold)</i>
Emergency bus	CONFIRM ALIVE <i>(battery — consoles + life support retained)</i>

☐ **SHUTDOWN COMPLETE** — ship cold; emergency bus on battery.

PRO-NOR HYPERSPACE JUMP

NOTE Hyperspace speed is set by the drive **power factor** (1–9): a higher factor is faster but draws more Main-bus power and loads the drive's cooling loops. The hyperdrive requires Main-bus supply.

1 — PRE-JUMP

Challenge	Response
Course	SET & CONFIRM <i>(heading / waypoint to destination)</i>
Hyperdrive power	ALLOCATE <i>(Main bus — sufficient for the chosen factor)</i>
Hyperspace factor	SELECT <i>(1–9; higher = faster / hotter)</i>
Cooling	CONFIRM CAPACITY <i>(the jump adds heat to the drive loops)</i>

2 — CHARGE

Challenge	Response
Course	CONFIRM CLEAR <i>(of bodies and contacts)</i>
Hyperdrive	CHARGE <i>(field spools up)</i>
Drive heat / coolant	MONITOR

3 — JUMP

Challenge	Response
Hyperspace	ENGAGE
In transit	MONITOR <i>(drive heat, fuel)</i>

CAUTION Holding the field loads the drive's cooling loops — watch coolant temperature, especially at high factor. Reversion inside a gravity well is hazardous (see PRO-ABN, FTL INTERDICTED / COLLISION).

4 — ARRIVAL

Challenge	Response
Hyperspace	DISENGAGE at the destination
Sub-light flight	RESUME
Drive	COOL DOWN — MONITOR <i>(coils stay hot, bleed off over ~10 s)</i>

☐ **JUMP COMPLETE**

PRO-NOR BATTLE STATIONS

Alert state is set by Command. Two levels escalate the ship's posture:

Level	Label	Trigger	Posture
LEVEL 2	LEVEL 2 BATTLE STATIONS (amber)	Unidentified / potential threat	Shields up ; weapons to standby; all stations manned
LEVEL 1	LEVEL 1 BATTLE STATIONS (red)	Hostile contact confirmed	Weapons up AND shields up ; combat power; damage control manned

Set LEVEL 2 — potential threat

Challenge	Response
Alert	SET LEVEL 2 <i>(Command)</i>
All stations	MANNED / CLOSED UP
Shields	RAISE — ALL FACINGS
Weapons	STANDBY <i>(fire control up; held safe)</i>
Damage control	STANDBY

Set LEVEL 1 — hostile confirmed

Challenge	Response
Alert	SET LEVEL 1 <i>(Command)</i>
Shields	UP — CONFIRM ALL FACINGS
Weapons	ARM & POWER UP <i>(fire control; charge; lock as directed)</i>
Power	COMBAT ALLOCATION <i>(shields + weapons priority)</i>
Damage control	MANNED

Stand down — return to Condition Green

Challenge	Response
Threat	RESOLVED — CONFIRM
Weapons	SAFE / DISARM
Alert	SET GREEN <i>(Command)</i>
Shields	AS REQUIRED
Power	CRUISE ALLOCATION

☐ **STAND DOWN COMPLETE**

PART PRO-ABN — ABNORMAL & EMERGENCY

The abnormal & emergency procedures are the **ESMS drills** — one per fault, grouped by system, each an action list worked top to bottom to **- STATUS -**. They are bound separately as **Part PRO-ABN** (38 drills across POWER & ENGINEERING · HEAT & COOLANT · FUEL · FLIGHT & FTL · HULL & DEFENCE · LIFE SUPPORT · TACTICAL & SENSORS). The condensed forms are in the QRH.

COMPANION VOLUMES

This Operating Manual is issued with: - **Part PRO-ABN** — Abnormal & Emergency (the ESMS drills) - **Volume III — Crew Handling Manual (CHM)** — operating philosophy and the golden rules - **Volume IV — Minimum Equipment List (MEL)** — dispatch limits - **Volume V — Technical & Ordnance Catalog (TEC)** — equipment specifications, weapons, ordnance, hull-code reference, and the per-class Ship Data Sheets - **Quick Reference Handbook (QRH)** — the condensed checklists for use at the console

PART GLOSSARY — ABBREVIATIONS & TERMS

Term	Meaning
ESMS	Electronic Spaceship Monitoring System — the ship's fault-monitoring and alert system
WARNING / CAUTION	Red (immediate) / amber (significant) ESMS alert levels
MASTER WARN / CAUT	The shipwide warning/caution annunciator lights
STATUS	The end of a drill's sensed actions; review the inoperative systems
INOP SYS	Inoperative systems — what is lost while a fault stands
MAIN / A / B / EMERGENCY	The four power buses (high → low tier)
BUS TIE	An interlock that passes a bus's surplus to another bus
AUTO BALANCE	Automatic trim of source output to bus demand
SHORE / MAINTENANCE POWER	Station power fed to buses A/B while docked
CRITICAL LOAD	A load never shed or breaker-tripped (life support, consoles)
PRO-NOR / PRO-ABN	Normal / Abnormal & Emergency procedures
QRH	Quick Reference Handbook
MEL	Minimum Equipment List
DSC / LIM / STA	Systems Description / Limitations / system chapter number
HULL CODE	Terse class designation (e.g. PC, FFG, BB); G = guided-missile
IFF	Identification — Friend or Foe (transponder interrogation)
FTL / HYPERSPACE FACTOR	Faster-than-light travel / the drive's speed setting (1–9)
BEARING / MARK / RANGE	Heliocentric position: two angles about the star + distance
COR / SPI / RIM / TRA	Coreward / Spinward / Rimward / Trailing — galactic cardinals
FACING	One of the six shield arcs (fore, aft, port, stbd, dorsal, ventral)
PAINT	Active sensor illumination of a target to support missile guidance
km/s · MW / GW	Sub-light speed unit · power units (1 unit = 1 MW)

DARKHELM — ABNORMAL & EMERGENCY PROCEDURES (PART PRO-ABN)

TERRAN NAVY · EARTH FEDERATION — Ship Operating Manual, Part PRO-ABN. Abnormal & emergency drills, grouped by system.

Each drill lists the actions for one **ESMS** alert — work top to bottom to **– STATUS –**. A **WARNING** (red) demands immediate action and lights the MASTER WARNING; a **CAUTION** (amber) lights the MASTER CAUTION. **[OR]** lines are alternatives — any one satisfies the step; **[if ...]** lines apply only in the stated condition.

POWER & ENGINEERING

RESERVE POWER — CAUTION

RESERVE POWER

- AUTO BALANCE OFF
- SOURCES ONLINE / RESTART
- SOURCE COOLING CONFIRM LOOP ON
- NON-ESSENTIAL LOAD SHED
- AUTO BALANCE ON (AS REQ)
 - STATUS –

Amplification. An emergency-bus battery is discharging to carry the load — generation is not meeting demand. Endurance is now limited to the battery's state of charge. Restore a source or shed load before the battery is exhausted.

INOP SYS: Endurance limited to battery charge.

POWER OVERLOAD — CAUTION

POWER OVERLOAD

- AUTO BALANCE OFF
- TRIPPED BREAKER IDENTIFY
- LOAD REDUCE / SHED
- SOURCE COOLING CONFIRM LOOP ON
- SOURCES CONFIRM ONLINE

- BREAKER RESET
- BUS TIES RE-CLOSE AS REQ
- AUTO BALANCE ON (AS REQ)
 - STATUS -

Amplification. Sustained demand exceeded supply on a bus and its protection has tripped, dropping that bus's non-critical loads. Reduce demand, then reset the affected breaker.

INOP SYS: Tripped consumers (until reset).

BATTERY LOW — CAUTION

BATTERY LOW

- SOURCES + COOLING RESTORE
- NON-ESSENTIAL LOAD SHED
 - STATUS -

Amplification. Emergency-bus battery charge is low. With generation lost, remaining console and life-support endurance is short — restore charging or bring a source on line.

INOP SYS: Reserve endurance reduced.

SUBSYSTEM DAMAGE — CAUTION

SUBSYSTEM DAMAGE

- AFFECTED SYSTEM IDENTIFY
- DAMAGE CONTROL DISPATCH
- SYSTEM LOAD REDUCE
 - STATUS -

Amplification. A system has taken damage and is degraded or offline. Dispatch damage control and reduce its load until repaired.

INOP SYS: Affected system (degraded / offline).

BLACKOUT — A & B BUSES OFF — WARNING

BLACKOUT — A & B BUSES OFF

- AUTO BALANCE OFF

- TIE MAIN → A CLOSE [if main bus up]
- TIE MAIN → B CLOSE [if main bus up]
- MAIN DEAD: TIE EMER → A/B CLOSE [if main bus dead]
- COOLING PUMPS ON
- FUSION REACTOR RESTART
- STATUS -

Amplification. Both working buses are dead — no impulse, cooling pumps or sensors. Work the power cold-start chain: restore A/B (battery reverse-tie if required), then cooling, then the reactors.

INOP SYS: Impulse, cooling pumps, sensors.

MAIN BUS OFF — WARNING

MAIN BUS OFF

- AUTO BALANCE OFF
- COOLING (A/B LOOP) CONFIRM ON
- MAIN SOURCE COOLING CONFIRM
- MAIN SUPPLY BREAKER RESET
- MAIN REACTOR ONLINE / RESTART
- OTHER BREAKERS / TIES RESET AS REQ
- AUTO BALANCE ON (AS REQ)
- STATUS -

Amplification. The main bus is unpowered — shields, hyperdrive and weapons have no supply. Confirm source cooling, reset the supply breaker, then restart the antimatter core.

INOP SYS: Shields, hyperdrive, weapons.

BUS A OFF — CAUTION

BUS A OFF

- AUTO BALANCE OFF
- SOURCE COOLING CONFIRM LOOP ON
- BUS A SOURCE ONLINE / RESTART [OR]
 - SOURCE BREAKER RESET [OR]
 - OR TIE TO LIVE BUS RAISE DONOR FIRST, CLOSE [OR]
- AFFECTED LOADS REROUTE
- AUTO BALANCE ON (AS REQ)
- STATUS -

Amplification. Bus A has lost supply. Loads fed only from A are down; A/B-shared loads continue on B. Restore the A-side source, or tie A from a live bus (raise the donor first).

INOP SYS: Bus-A-only loads.

BUS B OFF — CAUTION

BUS B OFF

- AUTO BALANCE OFF
- SOURCE COOLING CONFIRM LOOP ON
- BUS B SOURCE ONLINE / RESTART [OR]
 - SOURCE BREAKER RESET [OR]
 - OR TIE TO LIVE BUS RAISE DONOR FIRST, CLOSE [OR]
- AFFECTED LOADS REROUTE
- AUTO BALANCE ON (AS REQ)
 - STATUS –

Amplification. Bus B has lost supply. Loads fed only from B are down; A/B-shared loads continue on A. Restore the B-side source, or tie B from a live bus (raise the donor first).

INOP SYS: Bus-B-only loads.

EMERGENCY BUS OFF — WARNING

EMERGENCY BUS OFF

- EMER SOURCE / TIE START / CLOSE
- A►E or B►E TIE CLOSE AS REQ
- LIFE SUPPORT / NAV CONFIRM POWERED
 - STATUS –

Amplification. The emergency bus is unpowered — consoles and life support have lost their feed. This is critical: restore the battery or a tie to the emergency bus immediately.

INOP SYS: Consoles, life support, comms.

REACTOR OFFLINE — CAUTION

REACTOR OFFLINE

- AUTO BALANCE OFF

- REACTOR COOLING CONFIRM LOOP ON
- REACTOR RESTART
 - IF OVERHEAT-TRIPPED COOL, RESET BREAKER [if breaker still tripped]
- AUTO BALANCE ON (AS REQ)
 - STATUS -

Amplification. A power source is offline. Confirm its cooling, then restart it; until restored, the remaining sources carry the load with reduced margin.

INOP SYS: Reduced generation margin.

EMER BUS → A/B — CAUTION

EMER BUS → A/B

- GENERATION RESTORE ON A/B
- EMER → A/B TIE OPEN WHEN GENERATING
 - STATUS -

Amplification. The battery is feeding buses A/B through a reverse tie — normal only during a battery start or blackout recovery. It drains the battery quickly; open the tie once the reactors carry A/B.

INOP SYS: Battery discharging — limited duration.

HEAT & COOLANT

COOLING LOST — A & B LOOPS OFF — WARNING

COOLING LOST — A & B LOOPS OFF

- PUMP AUTO OFF
- BUS POWER (A/B) CONFIRM
- LOOP PUMPS ON
- HEAT GENERATION REDUCE
- PUMP AUTO ON (AS REQ)
 - STATUS -

Amplification. Both coolant loops are off or failed — system heat is no longer being cleared and will climb to damaging levels. Restore at least one loop at once and shed heat-producing loads.

INOP SYS: Both cooling loops.

OVERHEAT — WARNING

OVERHEAT

- PUMP AUTO OFF
- HOT SYSTEM IDENTIFY
- SYSTEM OUTPUT / LOAD REDUCE
- SERVING LOOP ON + PUMPS UP
- RADIATORS CONFIRM / DMG CTRL
- PUMP AUTO ON (AS REQ)
 - STATUS -

Amplification. A system has exceeded its heat limit and is taking integrity damage; left unchecked its breaker will latch off. Reduce its load and confirm its loop is cooling.

INOP SYS: Overheating system (impending trip).

COOLANT HOT — WARNING

COOLANT HOT

- PUMP AUTO OFF
- HEAT GENERATION REDUCE
- PUMPS INCREASE
- RADIATOR DAMAGE CHECK / DMG CTRL
- PUMP AUTO ON (AS REQ)
 - STATUS -

Amplification. A coolant loop is running hot — pump throughput or radiator rejection cannot keep up with the load. Reduce heat load or restore cooling capacity before systems overheat.

INOP SYS: Reduced cooling margin.

COOLANT LOOP A OFF — CAUTION

COOLANT LOOP A OFF

- LOOP A BUS POWER CONFIRM
- LOOP A PUMP ON

- PUMP AUTO / SPEED ON / INCREASE
- STATUS -

Amplification. Coolant loop A is not clearing heat; its share backs up and its systems warm. Restore the loop-A pump — loop B carries what it can in the interim.

INOP SYS: Loop A cooling.

COOLANT LOOP B OFF — CAUTION

COOLANT LOOP B OFF

- LOOP B BUS POWER CONFIRM
- LOOP B PUMP ON
- PUMP AUTO / SPEED ON / INCREASE
- STATUS -

Amplification. Coolant loop B is not clearing heat; its share backs up and its systems warm. Restore the loop-B pump — loop A carries what it can in the interim.

INOP SYS: Loop B cooling.

RADIATOR DAMAGE — CAUTION

RADIATOR DAMAGE

- DAMAGE CONTROL DISPATCH
- HEAT GENERATION REDUCE
- STATUS -

Amplification. A radiator's heat-rejection capacity is reduced — the affected loop's coolant will run hotter. Repair the radiator; the other loop compensates meanwhile.

INOP SYS: Reduced heat-rejection capacity.

STAR HEAT — WARNING

STAR HEAT

- HEADING AWAY FROM STAR
- RANGE OPEN

- SHIELDS UP
- STATUS -

Amplification. Stellar proximity is heating the shield bubble (or the hull/armour with shields down) — sustained exposure damages plating. Open the range from the star.

INOP SYS: Plating heating — withdraw.

FUEL

FUEL LOW — WARNING

FUEL LOW

- PROPULSION BURN MINIMISE
- NEAREST DEPOT PLOT
- REFUEL AS ABLE
- STATUS -

Amplification. Reactor or drive fuel stores are low. Plan resupply; at exhaustion the affected source or drive will stop.

INOP SYS: Endurance limited; FTL range reduced.

FLIGHT & FTL

COLLISION WARNING — WARNING

COLLISION WARNING

- HELM EVASIVE / ALL STOP
- SHIELDS UP
- CREW BRACE
- STATUS -

Amplification. A body or contact is on a collision course at close range. Alter course or stop. Reverting from hyperspace inside a body is fatal.

FTL INTERDICTED — CAUTION

FTL INTERDICTED

- JUMP UNAVAILABLE – NOTED
- SUB-LIGHT EGRESS MANOEUVRE CLEAR
- STATUS -

Amplification. A gravity well or interdiction field is preventing hyperspace engagement. Clear the well/field before attempting a jump.

INOP SYS: Hyperdrive (engagement blocked).

ENGINES OFFLINE — WARNING

ENGINES OFFLINE

- A/B BUS POWER CONFIRM / RESTORE
- ENGINE BUS CHECK / TIE
- ENGINE POWER RESTORE
- STATUS -

Amplification. The impulse engines have no power — no thrust and no attitude control. Restore engine bus/allocation; the ship is adrift until then.

INOP SYS: Impulse, manoeuvring.

HYPERDRIVE OFFLINE — CAUTION

HYPERDRIVE OFFLINE

- MAIN BUS POWER CONFIRM SUPPLY
 - HYPERDRIVE BREAKER RESET / RECONNECT
- HYPERDRIVE POWER RESTORE
- STATUS -

Amplification. The hyperdrive is offline — no FTL. Confirm Main-bus supply and the drive breaker, and that the drive is allocated power.

INOP SYS: Hyperspace travel.

HULL & DEFENCE

HULL DAMAGE — WARNING

HULL DAMAGE

- DAMAGE CONTROL DISPATCH
- SPEED / MANOEUVRE REDUCE
- SHIELDS UP
- RETURN TO STATION CONSIDER
- STATUS -

Amplification. Hull integrity is low; at breach, the affected compartment vents to space. Dispatch damage control and reduce exposure.

INOP SYS: Affected compartment (on breach).

ARMOUR LOW — CAUTION

ARMOUR LOW

- DAMAGED FACING ANGLE AWAY
- ARMOUR REPAIR AS ABLE
- STATUS -

Amplification. Armour is depleted over one or more facings — penetrating hits now reach the hull and internal systems. Re-orient to present an intact facing.

INOP SYS: Armour protection reduced.

SHIELDS LOW — CAUTION

SHIELDS LOW

- SHIELD POWER INCREASE
- FACINGS REBALANCE
- THREAT AXIS PRESENT STRONG ARC
- STATUS -

Amplification. Shield reserves are low across the bubble. Manage facings toward the threat and allow regeneration when fire slackens.

INOP SYS: Shield protection reduced.

SHIELD FACING DOWN — CAUTION

SHIELD FACING DOWN

- SHIP ATTITUDE TURN DOWNED ARC AWAY
- SHIELDS REBALANCE
- STATUS –

Amplification. A shield facing has collapsed — hits on that arc strike armour and hull directly. Turn an intact facing to the threat until it regenerates.

INOP SYS: Collapsed shield facing.

SHIELDS UNDER-POWERED — CAUTION

SHIELDS UNDER-POWERED

- ENGINEERING SUPPLY SHIELD POWER
- NON-ESSENTIAL LOAD SHED
- STATUS –

Amplification. Shields are receiving less power than assigned — regeneration rate and ceiling are degraded. Increase shield allocation or reduce competing main-bus loads.

INOP SYS: Shield performance reduced.

LIFE SUPPORT

LIFE SUPPORT FAILURE — WARNING

LIFE SUPPORT FAILURE

- LIFE SUPPORT POWER RESTORE
- BREACHES SEAL
- O2 CHECK RESERVE
- STATUS –

Amplification. Life support has failed — atmosphere is no longer maintained. Restore power to life support immediately; crew survival time is limited.

INOP SYS: Atmosphere regulation.

O2 RESERVE LOW — WARNING

O2 RESERVE LOW

- CO2 SCRUBBER CONFIRM POWERED
- CREW ACTIVITY MINIMISE
- BREACHES SEAL
 - STATUS –

Amplification. Oxygen reserve is low. Restore scrubber/generation and seal any breach. At crisis level the crew is endangered.

INOP SYS: Oxygen margin.

CO2 SCRUBBER — WARNING

CO2 SCRUBBER

- SCRUBBER POWER RESTORE
- SCRUBBER DAMAGE DAMAGE CONTROL
 - STATUS –

Amplification. The CO₂ scrubber is degraded or unpowered and CO₂ is rising. Restore scrubber power and integrity before it reaches crisis.

INOP SYS: CO₂ removal.

DECOMPRESSION — WARNING

DECOMPRESSION

- AFFECTED COMPT SEAL
- CREW EVACUATE COMPT
- HULL DAMAGE CONTROL
 - STATUS –

Amplification. A compartment is venting to space. The system auto-seals at threshold; assist with damage control and isolate the compartment.

INOP SYS: Breached compartment.

TACTICAL & SENSORS

NUCLEAR / RADIOLOGICAL — WARNING

NUCLEAR / RADIOLOGICAL

- SHIELDS UP
- RANGE FROM BURST OPEN
- CREW BRACE
- STATUS -

Amplification. A nuclear detonation has occurred nearby — blast plus an electromagnetic pulse that blinds sensors. Expect a sensor blackout and open the range.

INOP SYS: Sensors (temporary EMP blackout).

WEAPON LOCK — CAUTION

WEAPON LOCK

- ECM / EVASIVE AS REQUIRED
- SHIELDS UP
- THREAT ENGAGE / EVADE
- STATUS -

Amplification. A hostile has a firing solution on us. Break the lock with manoeuvre and countermeasures (decoy), confirm shields up, and engage as directed.

MISSILE INBOUND — CAUTION

MISSILE INBOUND

- POINT DEFENCE AUTO ON
- ECM AS REQUIRED
- HELM EVASIVE
- SHIELDS UP
- STATUS -

Amplification. One or more missiles are tracking us. Engage point-defence, deploy countermeasures (chaff / decoy), and manoeuvre to defeat the seekers.

WEAPONS UNDER-POWERED — CAUTION

WEAPONS UNDER-POWERED

- ENGINEERING SUPPLY WEAPONS PWR
- NON-ESSENTIAL LOAD SHED
- STATUS -

Amplification. Fire control / weapons are receiving less power than assigned — charge times lengthen and output falls. Increase weapons allocation.

INOP SYS: Weapon performance reduced.

SENSORS UNDER-POWERED — CAUTION

SENSORS UNDER-POWERED

- ENGINEERING SUPPLY SENSORS PWR
- NON-ESSENTIAL LOAD SHED
- STATUS -

Amplification. Sensors are under-powered — detection and classification range and rate are reduced. Increase sensor allocation.

INOP SYS: Sensor performance reduced.

PD UNDER-POWERED — CAUTION

PD UNDER-POWERED

- ENGINEERING SUPPLY WEAPONS PWR
- NON-ESSENTIAL LOAD SHED
- STATUS -

Amplification. Point-defence is under-powered — interception capability against inbound missiles is reduced. Increase its allocation, especially with missiles inbound.

INOP SYS: Point-defence performance reduced.

COMMS UNDER-POWERED — CAUTION

- COMMS UNDER-POWERED
- ENGINEERING

SUPPLY COMMS PWR
- NON-ESSENTIAL LOAD

SHED
- STATUS -

Amplification. Communications are under-powered — range and available channels are degraded. Increase comms allocation.

INOP SYS: Comms performance reduced.

STATUS MEMOS (Level 4 — informational)

Memo
DOCKED
MAINT POWER
RESUPPLY RDY
DEPARTURE CLR
SHIELDS UP
WEAPONS ARMED
FTL CHARGING
IN TRANSIT
AUTOPILOT
SILENT RUNNING
WING DEPLOYED
SHUTTLE OUT
ECM ACTIVE
DISTRESS BEACON
NUKE ARMED
TUBE OPEN
LAUNCH AUTH'D

DARKHELM QUICK REFERENCE HANDBOOK

(QRH)

TERRAN NAVY · EARTH FEDERATION — all registered classes

Document	TN-QRH-001
Classification	RESTRICTED — Operational Use Only
Companion	Ship Operating Manual (TN-SOM-001) — expanded procedures & the <i>why</i>

How to use — The QRH is the do-list you hold at the console. **NORMAL** checklists are challenge → response. **ABNORMAL** checklists follow the ESMS drill: work the actions top to bottom to **– STATUS** **–**, then review the inoperative systems. Boxed items are **memory (recall)** items — do them before opening the book.

NORMAL CHECKLISTS

NC-01 COLD START — NORMAL (docked, maintenance power)

Expanded procedure: SOM Part PRO-NOR, Cold Start. CAUTION: shore/maintenance power feeds A/B only — MAIN needs the antimatter reactor.

- 1 MAINTENANCE POWER
DOCK CONFIRM SECURE
MAINTENANCE POWER REQUEST
BUSES A/B CONFIRM UP (shore)
EMERGENCY BUS CONFIRM ALIVE (batt)
- 2 COOLING
COOLING LOOPS A/B ON
COOLING AUTO
LOOP COOLING CONFIRM RUNNING
- 3 REACTOR START
FUSION RCT A ONLINE (spool)
FUSION RCT B ONLINE (spool)
ANTIMATTER RCT (MAIN) ONLINE (spool)
SOURCES CONFIRM ONLINE & SPOOLED

BUS MAIN CONFIRM UP

4 AFTER START

AUTO BALANCE ON

BATTERY CHARGE ON

COOLING AUTO / CONFIRM

5 PRE-DEPARTURE

POWER ALLOCATION SET / RECALL PRESET

ESMS NO WARN / NO CAUT

6 DEPARTURE (TRANSFER TO SHIP POWER)

REACTORS A/B/MAIN ... CONFIRM TIED TO BUS

REACTOR OUTPUT UP TO CARRY THE BUS

[CAUTION: transfer to the reactor BEFORE
dropping shore, or the bus will trip]

MAINTENANCE POWER RELEASE (open shore brkr)

BUSES A/B/MAIN CONFIRM UP (no trip)

UNDOCK AS REQUIRED

□ COLD START COMPLETE

NOTE — no maintenance power (abnormal/battery start): AUTO BALANCE OFF; CLOSE reverse ties EMER→A / EMER→B (cooling pumps on battery — EMER BUS→A/B caution normal); light fusion then antimatter; once A/B carried, OPEN the reverse ties; AUTO BALANCE ON. Filed as a PRO-ABN procedure.

NC-02 SECURING — FULL SHUTDOWN (docked, maintenance power)

Expanded procedure: SOM Part PRO-NOR, Securing.

1 DOCK & MAINTENANCE POWER

DOCK CONFIRM SECURE

MAINTENANCE POWER REQUEST

AUTO BALANCE ON (shore-first)

2 STOP REACTORS

MAIN-BUS LOADS (shld/wpn/hyper) .. OFF

ANTIMATTER RCT (MAIN) OFFLINE

FUSION RCT A/B OFFLINE

SOURCES CONFIRM OFFLINE

3 COLD & DARK

COOLING OFF (as req)

MAINTENANCE POWER RELEASE
EMERGENCY BUS CONFIRM ALIVE (batt)
□ SHUTDOWN COMPLETE – cold, emer on battery

NC-03 HYPERSPACE JUMP

Expanded procedure: SOM Part PRO-NOR, Hyperspace Jump.

- 1 PRE-JUMP
COURSE SET & CONFIRM
HYPERDRIVE POWER ... ALLOCATE (MAIN)
HYPERSPACE FACTOR .. SELECT (1-9)
COOLING CONFIRM CAPACITY
- 2 CHARGE
COURSE CONFIRM CLEAR
HYPERDRIVE CHARGE
DRIVE HEAT MONITOR
- 3 JUMP
HYPERSPACE ENGAGE
TRANSIT MONITOR (heat / fuel)
- 4 ARRIVAL
HYPERSPACE DISENGAGE
SUB-LIGHT RESUME
DRIVE COOL DOWN
□ JUMP COMPLETE

NC-04 BATTLE STATIONS

L2 = shields up · L1 = weapons up + shields up. Alert set by Command.

- LEVEL 2 (potential threat)
- ALERT SET LEVEL 2
STATIONS MANNED
SHIELDS RAISE (all facings)
WEAPONS STANDBY
DAMAGE CONTROL STANDBY
- LEVEL 1 (hostile confirmed)
- ALERT SET LEVEL 1
SHIELDS UP (all facings)
WEAPONS ARM & POWER UP

POWER COMBAT ALLOCATION

DAMAGE CONTROL MANNED

STAND DOWN (to green)

THREAT RESOLVED

WEAPONS SAFE / DISARM

ALERT SET GREEN

SHIELDS AS REQUIRED

POWER CRUISE ALLOCATION

ABNORMAL & EMERGENCY CHECKLISTS

Worked top to bottom to **- STATUS -**. A **RED** title is a WARNING; an **AMBER** title is a CAUTION.

[OR] lines are alternatives; **[if ...]** lines apply only in the stated condition. The full drills (with the why and the inoperative systems) are in the Operating Manual, Part PRO-ABN.

POWER & ENGINEERING

RESERVE POWER — CAUTION

RESERVE POWER

- AUTO BALANCE OFF
- SOURCES ONLINE / RESTART
- SOURCE COOLING CONFIRM LOOP ON
- NON-ESSENTIAL LOAD SHED
- AUTO BALANCE ON (AS REQ)
 - STATUS -

POWER OVERLOAD — CAUTION

POWER OVERLOAD

- AUTO BALANCE OFF
- TRIPPED BREAKER IDENTIFY
- LOAD REDUCE / SHED
- SOURCE COOLING CONFIRM LOOP ON
- SOURCES CONFIRM ONLINE
- BREAKER RESET
- BUS TIES RE-CLOSE AS REQ

- AUTO BALANCE ON (AS REQ)
- STATUS -

BATTERY LOW — CAUTION

BATTERY LOW

- SOURCES + COOLING RESTORE
- NON-ESSENTIAL LOAD SHED
- STATUS -

SUBSYSTEM DAMAGE — CAUTION

SUBSYSTEM DAMAGE

- AFFECTED SYSTEM IDENTIFY
- DAMAGE CONTROL DISPATCH
- SYSTEM LOAD REDUCE
- STATUS -

BLACKOUT — A & B BUSES OFF — WARNING

BLACKOUT — A & B BUSES OFF

- AUTO BALANCE OFF
 - TIE MAIN → A CLOSE [if main bus up]
 - TIE MAIN → B CLOSE [if main bus up]
 - MAIN DEAD: TIE EMER → A/B CLOSE [if main bus dead]
- COOLING PUMPS ON
- FUSION REACTOR RESTART
- STATUS -

MAIN BUS OFF — WARNING

MAIN BUS OFF

- AUTO BALANCE OFF
- COOLING (A/B LOOP) CONFIRM ON
- MAIN SOURCE COOLING CONFIRM
- MAIN SUPPLY BREAKER RESET
- MAIN REACTOR ONLINE / RESTART
- OTHER BREAKERS / TIES RESET AS REQ
- AUTO BALANCE ON (AS REQ)
- STATUS -

BUS A OFF — CAUTION

BUS A OFF

- AUTO BALANCE OFF
- SOURCE COOLING CONFIRM LOOP ON
- BUS A SOURCE ONLINE / RESTART [OR]
 - SOURCE BREAKER RESET [OR]
 - OR TIE TO LIVE BUS RAISE DONOR FIRST, CLOSE [OR]
- AFFECTED LOADS REROUTE
- AUTO BALANCE ON (AS REQ)
 - STATUS -

BUS B OFF — CAUTION

BUS B OFF

- AUTO BALANCE OFF
- SOURCE COOLING CONFIRM LOOP ON
- BUS B SOURCE ONLINE / RESTART [OR]
 - SOURCE BREAKER RESET [OR]
 - OR TIE TO LIVE BUS RAISE DONOR FIRST, CLOSE [OR]
- AFFECTED LOADS REROUTE
- AUTO BALANCE ON (AS REQ)
 - STATUS -

EMERGENCY BUS OFF — WARNING

EMERGENCY BUS OFF

- EMER SOURCE / TIE START / CLOSE
- A►E or B►E TIE CLOSE AS REQ
- LIFE SUPPORT / NAV CONFIRM POWERED
 - STATUS -

REACTOR OFFLINE — CAUTION

REACTOR OFFLINE

- AUTO BALANCE OFF
- REACTOR COOLING CONFIRM LOOP ON
- REACTOR RESTART
 - IF OVERHEAT-TRIPPED COOL, RESET BREAKER [if breaker still tripped]
- AUTO BALANCE ON (AS REQ)
 - STATUS -

EMER BUS → A/B — CAUTION

EMER BUS → A/B

- GENERATION RESTORE ON A/B
- EMER → A/B TIE OPEN WHEN GENERATING
 - STATUS -

HEAT & COOLANT

COOLING LOST — A & B LOOPS OFF — WARNING

COOLING LOST — A & B LOOPS OFF

- PUMP AUTO OFF
- BUS POWER (A/B) CONFIRM
- LOOP PUMPS ON
- HEAT GENERATION REDUCE
- PUMP AUTO ON (AS REQ)
 - STATUS -

OVERHEAT — WARNING

OVERHEAT

- PUMP AUTO OFF
- HOT SYSTEM IDENTIFY
- SYSTEM OUTPUT / LOAD REDUCE
- SERVING LOOP ON + PUMPS UP
- RADIATORS CONFIRM / DMG CTRL
- PUMP AUTO ON (AS REQ)
 - STATUS -

COOLANT HOT — WARNING

COOLANT HOT

- PUMP AUTO OFF
- HEAT GENERATION REDUCE
- PUMPS INCREASE
- RADIATOR DAMAGE CHECK / DMG CTRL
- PUMP AUTO ON (AS REQ)
 - STATUS -

COOLANT LOOP A OFF — CAUTION

- COOLANT LOOP A OFF
- LOOP A BUS POWER CONFIRM
 - LOOP A PUMP ON
 - PUMP AUTO / SPEED ON / INCREASE
 - STATUS -

COOLANT LOOP B OFF — CAUTION

- COOLANT LOOP B OFF
- LOOP B BUS POWER CONFIRM
 - LOOP B PUMP ON
 - PUMP AUTO / SPEED ON / INCREASE
 - STATUS -

RADIATOR DAMAGE — CAUTION

- RADIATOR DAMAGE
- DAMAGE CONTROL DISPATCH
 - HEAT GENERATION REDUCE
 - STATUS -

STAR HEAT — WARNING

- STAR HEAT
- HEADING AWAY FROM STAR
 - RANGE OPEN
 - SHIELDS UP
 - STATUS -

FUEL

FUEL LOW — WARNING

- FUEL LOW
- PROPULSION BURN MINIMISE
 - NEAREST DEPOT PLOT

- REFUEL AS ABLE
- STATUS -

FLIGHT & FTL

COLLISION WARNING — WARNING

COLLISION WARNING

- HELM EVASIVE / ALL STOP
- SHIELDS UP
- CREW BRACE
- STATUS -

FTL INTERDICTED — CAUTION

FTL INTERDICTED

- JUMP UNAVAILABLE - NOTED
- SUB-LIGHT EGRESS MANOEUVRE CLEAR
- STATUS -

ENGINES OFFLINE — WARNING

ENGINES OFFLINE

- A/B BUS POWER CONFIRM / RESTORE
- ENGINE BUS CHECK / TIE
- ENGINE POWER RESTORE
- STATUS -

HYPERDRIVE OFFLINE — CAUTION

HYPERDRIVE OFFLINE

- MAIN BUS POWER CONFIRM SUPPLY
 - HYPERDRIVE BREAKER RESET / RECONNECT
- HYPERDRIVE POWER RESTORE
- STATUS -

HULL & DEFENCE

HULL DAMAGE — WARNING

HULL DAMAGE

- DAMAGE CONTROL DISPATCH
- SPEED / MANOEUVRE REDUCE
- SHIELDS UP
- RETURN TO STATION CONSIDER
- STATUS -

ARMOUR LOW — CAUTION

ARMOUR LOW

- DAMAGED FACING ANGLE AWAY
- ARMOUR REPAIR AS ABLE
- STATUS -

SHIELDS LOW — CAUTION

SHIELDS LOW

- SHIELD POWER INCREASE
- FACINGS REBALANCE
- THREAT AXIS PRESENT STRONG ARC
- STATUS -

SHIELD FACING DOWN — CAUTION

SHIELD FACING DOWN

- SHIP ATTITUDE TURN DOWNED ARC AWAY
- SHIELDS REBALANCE
- STATUS -

SHIELDS UNDER-POWERED — CAUTION

SHIELDS UNDER-POWERED

- ENGINEERING SUPPLY SHIELD POWER
- NON-ESSENTIAL LOAD SHED
- STATUS -

LIFE SUPPORT

LIFE SUPPORT FAILURE — WARNING

LIFE SUPPORT FAILURE

- LIFE SUPPORT POWER RESTORE
- BREACHES SEAL
- O2 CHECK RESERVE
 - STATUS -

O2 RESERVE LOW — WARNING

O2 RESERVE LOW

- CO2 SCRUBBER CONFIRM POWERED
- CREW ACTIVITY MINIMISE
- BREACHES SEAL
 - STATUS -

CO2 SCRUBBER — WARNING

CO2 SCRUBBER

- SCRUBBER POWER RESTORE
- SCRUBBER DAMAGE DAMAGE CONTROL
 - STATUS -

DECOMPRESSION — WARNING

DECOMPRESSION

- AFFECTED COMPT SEAL
- CREW EVACUATE COMPT
- HULL DAMAGE CONTROL
 - STATUS -

TACTICAL & SENSORS

NUCLEAR / RADIOLOGICAL — WARNING

NUCLEAR / RADIOLOGICAL

- SHIELDS UP
- RANGE FROM BURST OPEN
- CREW BRACE
 - STATUS -

WEAPON LOCK — CAUTION

- WEAPON LOCK
- ECM / EVASIVE AS REQUIRED
 - SHIELDS UP
 - THREAT ENGAGE / EVADE
 - STATUS -

MISSILE INBOUND — CAUTION

- MISSILE INBOUND
- POINT DEFENCE AUTO ON
 - ECM AS REQUIRED
 - HELM EVASIVE
 - SHIELDS UP
 - STATUS -

WEAPONS UNDER-POWERED — CAUTION

- WEAPONS UNDER-POWERED
- ENGINEERING SUPPLY WEAPONS PWR
 - NON-ESSENTIAL LOAD SHED
 - STATUS -

SENSORS UNDER-POWERED — CAUTION

- SENSORS UNDER-POWERED
- ENGINEERING SUPPLY SENSORS PWR
 - NON-ESSENTIAL LOAD SHED
 - STATUS -

PD UNDER-POWERED — CAUTION

- PD UNDER-POWERED
- ENGINEERING SUPPLY WEAPONS PWR
 - NON-ESSENTIAL LOAD SHED
 - STATUS -

COMMS UNDER-POWERED — CAUTION

COMMS UNDER-POWERED

- ENGINEERING SUPPLY COMMS PWR
- NON-ESSENTIAL LOAD SHED
- STATUS -

DARKHELM CREW HANDLING MANUAL (CHM)

Volume III — Operating Philosophy & Technique

TERRAN NAVY · EARTH FEDERATION — Bureau of Ships

Document	TN-CHM-001
Revision	0
Classification	RESTRICTED — Operational Use Only
Companion	Ship Operating Manual (TN-SOM-001) — the <i>what</i> ; this volume is the <i>how & why</i>

The SOM and QRH tell you **what** to do. This volume explains the **technique and philosophy** behind it — how a crew fights and flies the ship together. It is read, not actioned.

1. Philosophy

A warship is run by a **bridge crew**, each console owning one domain, under the **Command** station's direction. No one console wins or loses an engagement; the ship does, through coordination. The guiding ideas:

- **Power is finite and shared.** Every capability — shields, weapons, sensors, drives — is a draw on the same buses. Engineering's allocation decides what the ship can do at any moment; the rest of the crew flies and fights within that budget. Ask for power before you need it, not when you are already short.
- **Fly the ship first.** Attitude, heading and energy come before everything else. A ship that cannot manoeuvre cannot defend itself.
- **Let the ESMS run the abnormal.** When a fault annunciates, work its **drill** to STATUS, then review what is inoperative. Do not improvise around a sensed fault — the drill is the agreed recovery.
- **Talk.** The crew shares one ship over the intercom. Call your intentions, your contacts, and your problems out loud. Silence loses ships.

2. The Golden Rules

1. **Aviate, navigate, communicate.** Keep control of the ship, know where you are and where you are going, then coordinate — in that order, always.

2. **Power before posture.** Confirm the power and cooling to support an action before you commit to it (shields, a high hyperspace factor, a weapons-heavy engagement).
3. **One fault at a time.** Work the highest-priority ESMS drill to STATUS before chasing the next. The system sorts them into the order the crew should work them.
4. **Protect the critical bus.** Life support and consoles live on the emergency bus. Never trade it away — it is the one bus you keep alive at all costs.
5. **Cool what you run.** Heat is the silent killer. Every reactor and weapon produces it; confirm the loops are clearing it, especially under sustained load or at high hyperspace factor.
6. **Confirm the course is clear before you jump — and before you revert.** Reverting from hyperspace inside a body is fatal.
7. **Shields toward the threat.** Manage the six facings; never present a collapsed arc to an enemy.
8. **Authorise, then act.** Weapons release — and nuclear release in particular — follows the alert state and the required authority. Arm deliberately, safe deliberately.

3. Crew coordination by station

- **Command** sets the alert state and the engagement intent, and holds release authority. It does not fly or shoot — it decides.
- **Helm** owns attitude, heading, throttle and the jump. It calls the ship's energy state and keeps the threatened facing toward the enemy.
- **Engineering** owns the power and cooling budget. It pre-allocates for the expected posture (cruise, battle, jump) and calls brown-out risk before it bites.
- **Weapons** owns locks, fire and point-defence. It calls inbound missiles and requests the power it needs.
- **Sensors** owns the picture — detection, classification, painting and the datalink. It calls new contacts and threat changes first.
- **Comms** owns hailing, channels, subspace and IFF. It verifies contacts and runs station services.

4. Handling the alert states

- **Condition Green** — cruise. Power trimmed for endurance; shields down or low; weapons safe.
- **Level 2 Battle Stations** — a threat is possible. **Raise shields**, man all stations, bring fire control to standby, and have Engineering shift toward a combat allocation.
- **Level 1 Battle Stations** — a hostile is confirmed. **Weapons up and shields up**, combat power, damage control manned. Fight the ship.
- **Stand down** — threat resolved. Safe weapons, return the alert to green, and trim power back to cruise.

5. Engineering technique

- Run **AUTO BALANCE** in normal operations; take manual control for a start, a deliberate shed, or a fault.

- Pre-stage power for what is coming: shields and weapons before a fight, the hyperdrive before a jump.
- When transferring a bus from shore to ship power, **tie the reactor and bring its output up to carry the load before dropping shore power** — transferring to a cold source trips the bus.
- Watch coolant temperature, not just system heat: a hot loop throttles its own pumps and the systems then climb with it.

6. Combat technique

- Win the **sensor** fight first: detect and classify before you are detected, paint for your missiles, and share the picture on the datalink.
- Keep an intact facing to the threat and rotate damage off a depleting arc.
- Manage **point-defence and countermeasures** against missiles — do not rely on shields alone.
- Treat heat and power as part of the engagement: a ship that overheats its weapons or browns out its shields has lost the fight to its own plant.

DARKHELM — MINIMUM EQUIPMENT LIST (MEL)

TERRAN NAVY · EARTH FEDERATION — Volume IV.

Generic across all classes. The equipment *fit* (number of reactors, weapons, coolant units, etc.) varies by class — see the Ship Data Sheets (Volume V). An item marked **Required** is a critical load and the ship is not dispatched with it inoperative. Others *may be inoperative* subject to the operational (o) / maintenance (m) provisos in Remarks.

System	Bus	Dispatch	Remarks
Subspace Transceiver	MAIN	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Antimatter Reactor	MAIN	Required	Critical load — never shed; ship is not dispatched with it inoperative.
Fusion Reactor	A/B	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Battery Bank	EMERGENCY	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Emergency Coolant Unit	EMERGENCY	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Coolant Pump	A/B	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Radiator	—	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Impulse Drive	A/B	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Hyperdrive	MAIN	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Shield Generator	MAIN	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.

System	Bus	Dispatch	Remarks
Fire-Control / Weapons	MAIN	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Life Support	EMERGENCY	Required	Critical load — never shed; ship is not dispatched with it inoperative.
Sensor Array	A/B	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Communications	EMERGENCY	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
ECM Suite	MAIN	May be inoperative	(o) Confirm the load is shed or rerouted and the bus is protected. Where the class fits more than one, dispatch is permitted with one unit inoperative provided the remainder carry the load.
Bridge Consoles	EMERGENCY	Required	Critical load — never shed; ship is not dispatched with it inoperative.

DARKHELM — TECHNICAL & ORDNANCE CATALOG (TEC)

TERRAN NAVY · EARTH FEDERATION — Volume V.

Nominal manufacturer ratings. Equipment is listed by ascending Mark.

TEC-1 Component Catalog

Reactors & Power Sources

Designation	Name	Mk	Type	Output Max	Spool Rate	Fuel	Heat Output Max	Integrity Max
FR-1	Promethean HR-1 Fusion Reactor	Mk I	fusion	350 MW	100	deuterium	3	80
AR-1	Karman AM-1 Antimatter Core	Mk I	antimatter	9.0 GW	1500	antimatter	8	100
FR-C1	Vesta MX-1 Microfusion Core	Mk I	fusion	900 MW	250	deuterium	2	40
FR-2	Promethean HR-2 Fusion Reactor	Mk II	fusion	420 MW	112	deuterium	2.82	88
AR-2	Karman AM-2 Antimatter Core	Mk II	antimatter	10.8 GW	1650	antimatter	7.6	110
FR-C2	Vesta MX-2 Microfusion Core	Mk II	fusion	1.2 GW	300	deuterium	2.4	46
FR-3	Promethean HR-3 Fusion Reactor	Mk III	fusion	508 MW	124	deuterium	2.64	96
AR-3	Karman AM-3 Antimatter Core	Mk III	antimatter	13.1 GW	1800	antimatter	7.2	120
FR-4	Promethean HR-4 Fusion Reactor	Mk IV	fusion	612 MW	136	deuterium	2.46	104
AR-4	Karman AM-4 Antimatter Core	Mk IV	antimatter	15.8 GW	1950	antimatter	6.8	130
FR-5	Promethean HR-5 Fusion Reactor	Mk V	fusion	735 MW	148	deuterium	2.28	112

Designation	Name	Mk	Type	Output Max	Spool Rate	Fuel	Heat Output Max	Integrity Max
AR-5	Karman AM-5 Antimatter Core	Mk V	antimatter	18.9 GW	2100	antimatter	6.4	140
FR-6	Promethean HR-6 Fusion Reactor	Mk VI	fusion	875 MW	160	deuterium	2.1	120
AR-6	Karman AM-6 Antimatter Core	Mk VI	antimatter	22.5 GW	2250	antimatter	6	150
FR-7	Promethean HR-7 Fusion Reactor	Mk VII	fusion	1.0 GW	172	deuterium	1.92	128
AR-7	Karman AM-7 Antimatter Core	Mk VII	antimatter	27.0 GW	2400	antimatter	5.6	160
FR-8	Promethean HR-8 Fusion Reactor	Mk VIII	fusion	1.2 GW	184	deuterium	1.74	136
AR-8	Karman AM-8 Antimatter Core	Mk VIII	antimatter	32.4 GW	2550	antimatter	5.2	170

Coolant Pumps

Designation	Name	Mk	Cooling Rate	Power Draw Max	Integrity Max
CP-1	Thermal Dynamics CP-1 Coolant Pump	Mk I	60	150 MW	80
CP-C1	Thermal Dynamics CCm-1 Compact Coolant Pump	Mk I	34	50 MW	40
CP-2	Thermal Dynamics CP-2 Coolant Pump	Mk II	69	180 MW	86
CP-3	Thermal Dynamics CP-3 Coolant Pump	Mk III	79	220 MW	92
CP-4	Thermal Dynamics CP-4 Coolant Pump	Mk IV	91	265 MW	98
CP-5	Thermal Dynamics CP-5 Coolant Pump	Mk V	105	315 MW	104
CP-6	Thermal Dynamics CP-6 Coolant Pump	Mk VI	121	375 MW	110
CP-7	Thermal Dynamics CP-7 Coolant Pump	Mk VII	139	450 MW	116
CP-8	Thermal Dynamics CP-8 Coolant Pump	Mk VIII	160	530 MW	122

Radiators

Designation	Name	Mk	Radiator Rate	Integrity Max
RD-1	Thermal Dynamics RB-1 Radiator Bank	Mk I	52	100

Designation	Name	Mk	Radiator Rate	Integrity Max
RD-C1	Thermal Dynamics CBm-1 Compact Radiator	Mk I	30	40
RD-2	Thermal Dynamics RB-2 Radiator Bank	Mk II	60	108
RD-3	Thermal Dynamics RB-3 Radiator Bank	Mk III	69	116
RD-4	Thermal Dynamics RB-4 Radiator Bank	Mk IV	79	124
RD-5	Thermal Dynamics RB-5 Radiator Bank	Mk V	91	132
RD-6	Thermal Dynamics RB-6 Radiator Bank	Mk VI	105	140
RD-7	Thermal Dynamics RB-7 Radiator Bank	Mk VII	121	148
RD-8	Thermal Dynamics RB-8 Radiator Bank	Mk VIII	139	156

Emergency Cooling

Designation	Name	Mk	Cooling Rate	Integrity Max
CE-1	Thermal Dynamics EC-1 Emergency Coolant	Mk I	14	80
CE-C1	Thermal Dynamics ECm-1 Compact Emergency Coolant	Mk I	8	40
CE-2	Thermal Dynamics EC-2 Emergency Coolant	Mk II	17	85
CE-3	Thermal Dynamics EC-3 Emergency Coolant	Mk III	20	90
CE-4	Thermal Dynamics EC-4 Emergency Coolant	Mk IV	23	95
CE-5	Thermal Dynamics EC-5 Emergency Coolant	Mk V	26	100

Impulse Drives

Designation	Name	Mk	Power Draw Max	Heat Output Max	Integrity Max
IM-1	Helios IT-1 Impulse Drive	Mk I	300 MW	6	100
IM-C1	Kestrel TL-1 Light Impulse Thruster	Mk I	120 MW	3	40
IM-2	Helios IT-2 Impulse Drive	Mk II	360 MW	5.7	106
IM-C2	Kestrel TL-2 Sport Impulse Thruster	Mk II	180 MW	3.6	44
IM-3	Helios IT-3 Impulse Drive	Mk III	435 MW	5.4	112
IM-4	Helios IT-4 Impulse Drive	Mk IV	525 MW	5.1	118
IM-5	Helios IT-5 Impulse Drive	Mk V	630 MW	4.8	124
IM-6	Helios IT-6 Impulse Drive	Mk VI	750 MW	4.5	130
IM-7	Helios IT-7 Impulse Drive	Mk VII	900 MW	4.2	136

Designation	Name	Mk	Power Draw Max	Heat Output Max	Integrity Max
IM-8	Helios IT-8 Impulse Drive	Mk VIII	1.1 GW	3.9	142

Hyperdrives

Designation	Name	Mk	Power Draw Max	Heat Output Max	Integrity Max
HD-1	Voss FS-1 Hyperdrive	Mk I	2.6 GW	5	100
HD-2	Voss FS-2 Hyperdrive	Mk II	3.1 GW	4.75	106
HD-3	Voss FS-3 Hyperdrive	Mk III	3.8 GW	4.5	112
HD-4	Voss FS-4 Hyperdrive	Mk IV	4.5 GW	4.25	118
HD-5	Voss FS-5 Hyperdrive	Mk V	5.5 GW	4	124
HD-6	Voss FS-6 Hyperdrive	Mk VI	6.5 GW	3.75	130
HD-7	Voss FS-7 Hyperdrive	Mk VII	7.8 GW	3.5	136
HD-8	Voss FS-8 Hyperdrive	Mk VIII	9.2 GW	3.25	142

Shield Generators

Designation	Name	Mk	Power Draw Max	Regen Rate	Integrity Max
SG-1	Meridian DF-1 Shield Generator	Mk I	2.0 GW	8	100
SG-C1	Bulwark LS-1 Light Screen	Mk I	150 MW	5	40
SG-2	Meridian DF-2 Shield Generator	Mk II	2.4 GW	9	108
SG-C2	Bulwark LS-2 Combat Screen	Mk II	220 MW	8	46
SG-3	Meridian DF-3 Shield Generator	Mk III	2.9 GW	10	116
SG-C3	Bulwark LS-3 Assault Screen	Mk III	300 MW	11	52
SG-4	Meridian DF-4 Shield Generator	Mk IV	3.5 GW	11.2	124
SG-5	Meridian DF-5 Shield Generator	Mk V	4.2 GW	12.6	132
SG-6	Meridian DF-6 Shield Generator	Mk VI	5.0 GW	14.1	140
SG-7	Meridian DF-7 Shield Generator	Mk VII	6.0 GW	15.8	148
SG-8	Meridian DF-8 Shield Generator	Mk VIII	7.1 GW	17.7	156

Sensor Suites

Designation	Name	Mk	Power Draw Max	Passive Range	Active Range	Scan Rate	Integrity Max
SN-1	Argus SA-1 Sensor Array	Mk I	80 MW	50000	150000	0.6	80
SN-C1	Argus SCm-1 Compact Sensor Suite	Mk I	30 MW	20000	60000	0.5	40
SN-2	Argus SA-2 Sensor Array	Mk II	96 MW	57500	172500	0.65	85
SN-3	Argus SA-3 Sensor Array	Mk III	116 MW	66125	198375	0.7	90
SN-4	Argus SA-4 Sensor Array	Mk IV	140 MW	76044	228131	0.74	95
SN-5	Argus SA-5 Sensor Array	Mk V	168 MW	87450	262351	0.79	100
SN-6	Argus SA-6 Sensor Array	Mk VI	200 MW	100568	301704	0.84	105
SN-7	Argus SA-7 Sensor Array	Mk VII	240 MW	115653	346959	0.89	110
SN-8	Argus SA-8 Sensor Array	Mk VIII	284 MW	133001	399003	0.94	115

Battery Banks

Designation	Name	Mk	Capacity	Discharge Max	Charge Max	Armoured	Integrity Max
BT-1	Ampere PC-1 Power Cell	Mk I	907200	100 MW	20 MW	Yes	120
BT-C1	Ampere PCm-1 Compact Power Cell	Mk I	226800	20 MW	10 MW	No	60
BT-2	Ampere PC-2 Power Cell	Mk II	1088640	44 MW	22 MW	Yes	128
BT-3	Ampere PC-3 Power Cell	Mk III	1306368	48 MW	24 MW	Yes	136
BT-4	Ampere PC-4 Power Cell	Mk IV	1567642	53 MW	27 MW	Yes	144
BT-5	Ampere PC-5 Power Cell	Mk V	1881170	59 MW	29 MW	Yes	152
BT-6	Ampere PC-6 Power Cell	Mk VI	2257404	64 MW	32 MW	Yes	160

Designation	Name	Mk	Capacity	Discharge Max	Charge Max	Armoured	Integrity Max
BT-7	Ampere PC-7 Power Cell	Mk VII	2708885	70 MW	35 MW	Yes	168
BT-8	Ampere PC-8 Power Cell	Mk VIII	3250662	77 MW	38 MW	Yes	176

ECM Suites

Designation	Name	Mk	Power Draw Max	Integrity Max
ECM-1	Spectra EW-1 ECM Suite	Mk I	2.8 GW	70
ECM-2	Spectra EW-2 ECM Suite	Mk II	3.1 GW	75
ECM-3	Spectra EW-3 ECM Suite	Mk III	3.4 GW	80

Subspace Transceivers

Designation	Name	Mk	Power Draw Max	Subspace Range Ly	Integrity Max
ST-1	Aether ST-1 Subspace Transceiver	Mk I	2.4 GW	15	70
ST-2	Aether ST-2 Subspace Transceiver	Mk II	2.6 GW	20	75
ST-3	Aether ST-3 Subspace Transceiver	Mk III	2.9 GW	25	80

Weapon Arrays (point-defence / arrays)

Designation	Name	Mk	Power Draw Max	Integrity Max
WA-1	Tarsus FC-1 Fire-Control Computer	Mk I	2.5 GW	100
WA-C1	Tarsus FCm-1 Compact Fire-Control	Mk I	100 MW	40
WA-2	Tarsus FC-2 Fire-Control Computer	Mk II	3.0 GW	106
WA-C2	Tarsus FCm-2 Compact Fire-Control	Mk II	160 MW	46
WA-3	Tarsus FC-3 Fire-Control Computer	Mk III	3.6 GW	112
WA-4	Tarsus FC-4 Fire-Control Computer	Mk IV	4.4 GW	118
WA-5	Tarsus FC-5 Fire-Control Computer	Mk V	5.2 GW	124
WA-6	Tarsus FC-6 Fire-Control Computer	Mk VI	6.2 GW	130
WA-7	Tarsus FC-7 Fire-Control Computer	Mk VII	7.5 GW	136
WA-8	Tarsus FC-8 Fire-Control Computer	Mk VIII	8.9 GW	142

Life Support

Designation	Name	Mk	Power Draw Max	Integrity Max
LS-1	Vitalis LS-1 Life Support	Mk I	10 MW	90
LS-2	Vitalis LS-2 Life Support	Mk II	10 MW	96
LS-3	Vitalis LS-3 Life Support	Mk III	10 MW	102

Communications

Designation	Name	Mk	Power Draw Max	Integrity Max
CM-1	Nexus CM-1 Comms Suite	Mk I	5 MW	80
CM-2	Nexus CM-2 Comms Suite	Mk II	5 MW	85
CM-3	Nexus CM-3 Comms Suite	Mk III	5 MW	90

Console Suites

Designation	Name	Mk	Power Draw Max	Integrity Max
CN-1	Nexus CN-1 Bridge Consoles	Mk I	6 MW	80
CN-2	Nexus CN-2 Bridge Consoles	Mk II	6 MW	85
CN-3	Nexus CN-3 Bridge Consoles	Mk III	6 MW	90

TEC-2 Weapons

Beam

Designation	Name	Damage	Range	Charge Time	Damage Type	Armor Piercing	Tracking
BL-1	Halcyon PL-1 Pulse Laser	34	4800	2.2	conventional	0	0.3
BM-1	Halcyon BC-1 Beam Cannon	50	6000	2.4	conventional	0	0.2
BH-1	Halcyon HL-1 Heavy Lance	68	7000	2.7	conventional	0	0.1
BM-C1	Vulcan LP-1 Light Pulse Cannon	40	4500	2	conventional	0	0.79
BL-2	Halcyon PL-2 Pulse Laser	40	5400	2.07	conventional	0	0.3

Designation	Name	Damage	Range	Charge Time	Damage Type	Armor Piercing	Tracking
BM-2	Halcyon BC-2 Beam Cannon	59	6700	2.26	conventional	0	0.2
BH-2	Halcyon HL-2 Heavy Lance	80	7800	2.54	conventional	0	0.1
BM-C2	Vulcan LP-2 Heavy Pulse Cannon	60	5000	2.6	conventional	0	0.79
BL-3	Halcyon PL-3 Pulse Laser	47	6000	1.94	conventional	0	0.3
BM-3	Halcyon BC-3 Beam Cannon	70	7500	2.12	conventional	0	0.2
BH-3	Halcyon HL-3 Heavy Lance	95	8800	2.39	conventional	0	0.1
BL-4	Halcyon PL-4 Pulse Laser	56	6700	1.83	conventional	0	0.3
BM-4	Halcyon BC-4 Beam Cannon	82	8400	1.99	conventional	0	0.2
BH-4	Halcyon HL-4 Heavy Lance	112	9800	2.24	conventional	0	0.1
BL-5	Halcyon PL-5 Pulse Laser	66	7600	1.72	conventional	0	0.3
BM-5	Halcyon BC-5 Beam Cannon	97	9400	1.87	conventional	0	0.2
BH-5	Halcyon HL-5 Heavy Lance	132	11000	2.11	conventional	0	0.1
BL-6	Halcyon PL-6 Pulse Laser	78	8500	1.61	conventional	0	0.3
BM-6	Halcyon BC-6 Beam Cannon	114	10600	1.76	conventional	0	0.2
BH-6	Halcyon HL-6 Heavy Lance	156	12300	1.98	conventional	0	0.1
BL-7	Halcyon PL-7 Pulse Laser	92	9500	1.5	conventional	0	0.3
BM-7	Halcyon BC-7 Beam Cannon	134	11900	1.65	conventional	0	0.2
BH-7	Halcyon HL-7 Heavy Lance	184	13800	1.85	conventional	0	0.1
BL-8	Halcyon PL-8 Pulse Laser	109	10600	1.39	conventional	0	0.3

Designation	Name	Damage	Range	Charge Time	Damage Type	Armor Piercing	Tracking
BM-8	Halcyon BC-8 Beam Cannon	158	13300	1.54	conventional	0	0.2
BH-8	Halcyon HL-8 Heavy Lance	217	15400	1.72	conventional	0	0.1

Missile

Designation	Name	Damage	Range	Charge Time	Damage Type	Armor Piercing	Tracking
MT-1	Halcyon ML-1 Missile Launcher		30000				
MT-C1	Hornet RP-1 Rocket Pod		18000				
MT-2	Halcyon ML-2 Missile Launcher		30000				
MT-3	Halcyon ML-3 Missile Launcher		30000				

Point Defence

Designation	Name	Damage	Range	Charge Time	Damage Type	Armor Piercing	Tracking
PD-1	Halcyon PD-1 Point-Defence		3200				0.6
PD-C1	Halcyon PDm-1 Compact Point-Defence		2800				0.6
PD-2	Halcyon PD-2 Point-Defence		3600				0.6
PD-3	Halcyon PD-3 Point-Defence		4000				0.6

TEC-3 Consumables & Ordnance

Conventional Missiles & Torpedoes

Designation	Name	Warhead	Speed	Tracking	Endurance	Type	AP
MSL-S	Ares SRM-1 Strike Missile	120	1500	25	30	conventional	0
MSL-H	Ares HVM-1 Heavy Missile	280	900	14	35	conventional	0

Designation	Name	Warhead	Speed	Tracking	Endurance	Type	AP
MSL-W	Vespa SWM-1 Swarmer	55	2600	45	20	conventional	0
MSL-C	Vespa CLM-1 Cluster Munition	38	2400	52	16	conventional	0
MSL-T	Vulcan PLT-1 Plasma Torpedo	420	700	10	40	conventional	0.2
MSL-G	Vulcan SGT-1 Siege Torpedo	640	560	8	46	conventional	0.45
MSL-AP	Ares APL-1 Lance Penetrator	160	1400	22	30	conventional	0.6
MSL-LR	Ares LRM-1 Longbow	200	1800	20	56	conventional	0.7
MSL-E	Ion DSR-1 Disruptor	40	1600	28	28	emp	0

Nuclear Ordnance

Four warhead types of escalating yield, launched from dedicated tubes under a multi-station launch authorisation. Each detonates with an area blast and a sensor-blinding electromagnetic pulse; all are carried safed until armed and authorised. Listed by ascending yield.

Designation	Name	Yield	Speed
MSL-N1	Titan TN-1 Stiletto	5 kT	2200
MSL-N2	Titan HVN-2 Hammer	50 kT	2100
MSL-N3	Titan HVN-3 Hammerhead	1.0 MT	1900
MSL-N4	Titan HVN-4 Skybreaker	5.0 MT	1700

Countermeasures

Designation	Name	Against	Break Chance	Radius Km	Cooldown	Desc
CM-C	Chaff Cloud	missile	0.7	5000	4	Bursts a radar-reflective cloud. Inbound missiles homing on us within the cloud roll to lose their lock and fly ballistic.
CM-D	ECM Decoy	lock		7000	7	Launches an active decoy. Knocks down hostile weapon locks on us and can spoof inbound missiles into flying ballistic.

Fuels

Designation	Name	Units	Note
FUEL-AM	Antimatter	g	High-density antimatter for the main reactor.
FUEL-D	Deuterium	kg	Fusion fuel for the aux reactors.

Designation	Name	Units	Note
FUEL-T	Tritium	kg	Premium fusion fuel — higher yield aux burn.

TEC-4 Hull-Code Reference

Type letters and the guided-missile modifier:

Code	Meaning
C	Cruiser / Carrier line (large combatant)
V	Aviation — fixed-wing carrier
B	Battleship / battle line (heaviest gun combatant)
D	Destroyer (escort / line)
F	Frigate (escort, lighter than a destroyer)
P	Patrol (small combatant)
L	Amphibious / landing (assault, marines, boarding)
A	Auxiliary (support / non-combatant)
G	MODIFIER — Guided missile (e.g. DD -> DDG, FF -> FFG, C -> CG)
T-	PREFIX — Civilian / contractor-crewed auxiliary (e.g. T-AK)

Combatant classes:

Code	Class	Description
CV	Fleet Carrier	Fleet carrier; strike-craft platform and flagship. Largest combatant.
BB	Battleship	Battle-line combatant built around the heaviest direct-fire batteries and armour.
BC	Battlecruiser	Battleship-grade guns on a faster, lighter-armoured hull.
CG	Guided-Missile Cruiser	Large multi-role combatant; heavy missile and beam batteries, command capable.
CA	Heavy Cruiser	Heavy gun cruiser; long-range line combatant.
CL	Light Cruiser	Lighter, faster cruiser; screening and independent patrol.
DDG	Guided-Missile Destroyer	Destroyer with a designed guided-missile system; backbone line escort.
DD	Destroyer	Fast gun escort and screen combatant.
FFG	Guided-Missile Frigate	Frigate with a designed missile system; workhorse escort.
FF	Frigate	Light escort warship, smaller than a destroyer.
PC	Patrol Corvette	Small patrol combatant; the lightest crewed warship.

Code	Class	Description
PG	Gunboat	Small, heavily-gunned short-range patrol craft.
LHD	Assault Carrier (multipurpose)	Amphibious assault ship; carries marines/boarding craft, some strike capacity.
LHA	Assault Carrier (general)	General-purpose amphibious assault ship.

TEC-5 Ship Data Sheets

All registered Navy and auxiliary classes, by service. Dimensions are nominal (class scale). Crew is a nominal complement. *Carrier* = fitted with a strike-craft hangar (Flight Operations, STA 45).

Belt Coalition

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
FF	Frigate	Warden	Convoy Guard	145 × 28 × 26	128	14	—	2× Beam Cannon (fwd), 1× Aft Pulse Laser, 1× Missile Tube, Point Defence
PG	Gunboat	Prospector	Patrol Gunboat	115 × 24 × 22	150	13	—	2× Pulse Laser (fwd), Point Defence

Earth Federation

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
AS	Tender	Bastion	Fleet Tender	260 × 60 × 55	100	20	—	2× Beam Cannon (fwd), Aft Pulse Laser, 2× Point Defence
BB	Battleship	Sovereign	Battle Line Flagship	700 × 120 × 105	95	42	—	4× Heavy Lance + 4× Beam Cannon (fwd), port/stbd Beam Cannon broadsides, 2× Aft Pulse Laser, 6× Missile Tubes, 6× Point Defence
CG	Cruiser	Aegis	Fleet Cruiser	380 × 64 × 56	112	26	—	2× Heavy Lance + 2× Beam Cannon (fwd), port/stbd Beam Cannon broadside, Aft Pulse Laser, 4× Missile Tubes, 3× Point Defence

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
CV	Carrier	Ascendant	Fleet Carrier	600 × 110 × 90	96	38	Yes	8× Point Defence belt, 2× Beam Cannon (fwd), port/stbd Beam, 2× Missile Tube — fights through its wing
DDG	Destroyer	Vanguard	Line Combatant	220 × 38 × 34	130	18	—	1× Heavy Lance + 2× Beam Cannon (fwd), 1× Aft Pulse Laser, 2× Missile Tubes, 2× Point Defence
FFG	Frigate	Sentinel	Escort	145 × 28 × 26	155	14	—	2× Beam Cannon (fwd), 1× Aft Pulse Laser, 1× Missile Tube, Point Defence
PC	Corvette	Darkhelm	Patrol	90 × 18 × 16	200	11	—	—

Free Traders

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
PC	Armed Clipper	Outrider	Convoy Escort	95 × 20 × 18	178	12	—	2× Pulse Laser (fwd), Point Defence.
T-AK	Bulk Freighter	Caravan	Cargo Hauler	320 × 80 × 75	92	23	—	Point Defence only — unarmed merchantman.
T-AO	Oiler	Cistern	Fleet Tanker	340 × 90 × 80	84	24	—	Point Defence only — unarmed fleet tanker.

Helios Combine

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
AC	Armed Clipper	Argosy	Security Hauler	95 × 20 × 18	108	12	—	2x Beam Cannon (concealed), 1x Missile Tube, 3x Point Defence
BB	Battleship	Bulwark	Capital Asset	700 × 120 × 105	96	42	—	3x Heavy Lance + 4x Beam Cannon (fwd), port/stbd Beam broadside, 2x Aft Pulse Laser, 5x Missile Tubes, 5x Point Defence

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
CA	Cruiser	Magnate	Fleet Cruiser	380 × 64 × 56	118	26	—	2x Heavy Lance + 4x Beam Cannon (fwd), Aft Pulse Laser, 4x Missile Tubes, 3x Point Defence
CC	Corvette	Sentinel	Security Patrol	90 × 18 × 16	175	11	—	2x Beam Cannon (fwd), Aft Pulse Laser, 1x Missile Tube, Point Defence
CV	Carrier	Corona	Fleet Carrier	600 × 110 × 90	96	38	Yes	8× Point Defence belt, 2× Beam Cannon (fwd), port/stbd Beam, 2× Missile Tube — fights through its wing
DD	Destroyer	Enforcer	Security Destroyer	220 × 38 × 34	148	18	—	3x Beam Cannon (fwd), Aft Pulse Laser, 2x Missile Tubes, 2x Point Defence

Independent

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
FF	Frigate	Freelancer	Mercenary	145 × 28 × 26	150	14	—	2× Beam Cannon (fwd), 1× Aft Pulse Laser, 1× Missile Tube, Point Defence
PC	Corvette	Vagrant	Scout / Courier	90 × 18 × 16	182	11	—	1× Pulse Laser (fwd), Point Defence

Mars Republic

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
BC	Battlecruiser	Conqueror	Capital Striker	520 × 78 × 70	120	33	—	4× Heavy Lance + 2× Beam Cannon (fwd), port/stbd Beam Cannon broadside, Aft Pulse Laser, 4× Missile Tubes, 4× Point Defence
CA	Cruiser	Warlord	Heavy Cruiser	380 × 64 × 56	124	26	—	4× Heavy Lance + 2× Beam Cannon (fwd), port/stbd Beam Cannon broadside, Aft Pulse

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
								Laser, 2× Missile Tubes, 3× Point Defence
CV	Carrier	Olympus	Fleet Carrier	600 × 110 × 90	96	38	Yes	8× Point Defence belt, 2× Beam Cannon (fwd), port/stbd Beam, 2× Missile Tube — fights through its wing
DDG	Destroyer	Basilisk	Strike Destroyer	220 × 38 × 34	148	18	—	2× Heavy Lance (fwd), 2× Beam Cannon (fwd), 1× Aft Pulse Laser, 2× Missile Tubes, Point Defence
FFG	Frigate	Talon	Fast Attack	145 × 28 × 26	168	14	—	2× Beam Cannon (fwd), 1× Aft Pulse Laser, 1× Missile Tube, Point Defence

Outer Colonies Coalition

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
CA	Cruiser	Bastion	Coalition Flagship	380 × 64 × 56	108	26	—	2x Heavy Beam + 4x Beam Cannon (fwd), Aft Pulse Laser, 3x Missile Tubes, 3x Point Defence
CC	Corvette	Ranger	Militia Patrol	90 × 18 × 16	158	11	—	2x Beam Cannon (fwd), Aft Pulse Laser, 1x Missile Tube, 2x Point Defence
DD	Destroyer	Homestead	Line Defender	220 × 38 × 34	124	18	—	3x Beam Cannon (fwd), Aft Pulse Laser, 2x Missile Tubes, 2x Point Defence
FF	Frigate	Pioneer	Frontier Escort	145 × 28 × 26	140	14	—	1x Heavy Beam + 2x Beam Cannon (fwd), Aft Pulse Laser, 1x Missile Tube, 2x Point Defence
T- AK	Bulk Freighter	Mule	Armed Hauler	320 × 80 × 75	90	23	—	2x Beam Cannon, Aft Pulse Laser, 2x Missile Tubes, 3x Point Defence

Pirates

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
FF	Frigate	Marauder	Raider	145 × 28 × 26	140	14	—	2× Pulse Beam (fwd), 1× Aft Beam, 1× Missile Tube, Point Defence
PC	Patrol Corvette	Cutter	Interceptor	82 × 16 × 14	175	11	—	2× Pulse Beam (fwd), Point Defence
PG	Gunboat	Gunship	Missile Boat	115 × 24 × 22	125	13	—	2× Missile Tube, 1× Pulse Beam, Point Defence

Raider Clan

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
CA	Cruiser	Dreadnought	Raider Flagship	380 × 64 × 56	116	26	—	3× Heavy Lance + 3× Beam Cannon (fwd), port/stbd Pulse Laser broadside, 3× Missile Tubes, 3× Point Defence
DD	Destroyer	Raider Destroyer	Line Combatant	220 × 38 × 34	110	18	—	2× Heavy Beam (fwd), 1× Aft Beam, 2× Missile Tube, 2× Point Defence
FF	Frigate	Raider Corsair	Assault	145 × 28 × 26	135	14	—	3× Heavy Beam, 1× Missile Tube, Point Defence

Solar Dominion

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
BB	Battleship	Dominus	Battle Line Flagship	700 × 120 × 105	94	42	—	4x Heavy Lance + 4x Beam Cannon (fwd), port/stbd Beam broadside, 2x Aft Pulse Laser, 4x Missile Tubes, 6x Point Defence
BH	Heavy Battleship	Inquisitor	Dominion Heavy Battleship	820 × 135 × 118	82	48	—	6x Heavy Lance + 6x Beam Cannon (fwd), port/stbd Beam broadside, 2x Aft Pulse Laser, 6x Missile Tubes, 8x Point Defence

Hull	Class	Name	Role	L×B×H (m)	Max Spd (km/s)	Crew	Carrier	Armament
CA	Cruiser	Tribune	Battle Cruiser	380 × 64 × 56	112	26	—	3x Heavy Lance + 2x Beam Cannon (fwd), port/stbd Beam broadside, Aft Pulse Laser, 3x Missile Tubes, 3x Point Defence
CV	Carrier	Aquila	Fleet Carrier	600 × 110 × 90	96	38	Yes	8× Point Defence belt, 2× Beam Cannon (fwd), port/stbd Beam, 2× Missile Tube — fights through its wing
DD	Destroyer	Praetor	Strike Destroyer	220 × 38 × 34	126	18	—	2x Heavy Lance + 2x Beam Cannon (fwd), port/stbd Beam, Aft Pulse Laser, 2x Missile Tubes, 2x Point Defence
FF	Frigate	Lictor	Line Picket	145 × 28 × 26	150	14	—	2x Heavy Beam + 2x Beam Cannon (fwd), Aft Pulse Laser, 1x Missile Tube, 2x Point Defence