Little Black Book 2 Expanded

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Preface and Notes

The first Classic Traveller edition to come out in 1977 included three "Little Black Books" (or "LBBs" for short). LBB1 dealt with character generation and personal combat; LBB2 dealt with starship operation, design and combat; LBB3 dealt with world generation, equipment and adventures. Over the time, the material presented in these books was expanded by several more LBBs (Mercenary and High Guard) for example. However, the starship design and combat rules presented in High Guard (HG for short) had a profoundly different set of assumptions for LBB2, and favored, for example, large naval battles between giant starships instead of LBB2's more character-level, maneuver-based space combat between small ships. Due to these reasons, LBB2 remained a popular starship design and combat system even to this day. This article attempts to allow LBB2 fans (such as the author) to expand their LBB2 experience and to greatly diversify their ship design options.

All the rules suggested here are intended for Classic Traveller's Book 2, though they should be adaptable, with some work, to other versions of Traveller.

The Universe implied by these Rules

Adding new equipment, especially in the sphere of military technology, can change your Traveller universe in both obvious and subtle ways. Referees are advised to read and consider these rules and additions carefully before adding them to their game. The original, unmodified LBB2 rules create a universe in which there were few differences between a well-armed civilian ship and a military one (as was, historically, during the Age of Sail); as weapons were relatively and readily available, the only real difference between civilian and military ships was in their computers and their sensors; nevertheless, a well-armed civilian ship could still pose a clear threat to a military craft. Also, small craft (such as fighters) were extremely effective, especially when mounting missiles.

This article changes this outlook in several ways. First, the inclusion of ship armor and heavy weapons (Plasma and Fusion Guns and Missile Tubes) makes military ships both more resistant to attacks and capable of dishing out more significant punishment; it also makes them far more expensive. The inclusion of extended sensor rules does the same. However, while these rules make military ships far more effective in combat that their civilian counterparts, they still allow civilian ships a chance to succeed in damaging military craft, especially when missiles are involved. Military ships are still manageably small, and a well-prepared players' ship still has a chance to take out, or, for the very least, cripple a small military ship.

These rules imply a more "modern" universe rather than the Age of Sail one implied by LBB2. The remote central government possessed of great industrial and technological might assumed by the Traveller rules (the Imperium, for example) would have access to great naval might as well, far greater than that affordable by smaller, local governments or most corporations. However, due to the sheer distances and travel times involved, it is unable to send its entire fleet everywhere within its star-spanning realm at once. As a result, players will encounter a mix of low-power and mid-power starships with a rare high-power one on occasion, especially when traveling in frontier regions. Of course, anyone (government, individual or corporation) stupid enough to become a threat to the central government or greatly disrupt commerce would, eventually, face the "Big Stick" of the Imperium (or your universe's equivalent of it); otherwise, the local governments will deal with things such as pirates, terrorists and small-scale military conflicts.

Part One – General Suggestions

This is a collection of general ideas, clarifications, judgments and rule changes intended to improve and expand the LBB2 starship experience; use, abuse or ignore them as you see fit.

A few deck plan design ideas

1) The bridge tonnage given in LBB2 includes more than simply the physical bridge itself. While the exact composition of this tonnage is not given in LBB2, deck plan design calls for a more precise definition. I suggest the following: 50% of the bridge tonnage would be the actual Bridge, with workstations and workspace for the command crew (Pilot, Navigator, Chief Engineer, Chief Gunner, and, in larger ships, also CO and XO); 25% would be communication arrays and avionics (to which the computer tonnage should contribute as well, see below); 12.5% would be the ship's airlock(s); and 12.5% would go to office space, a "ready room" and a fresher for the bridge and command crew.

2) While the computer tonnage given in LBB2 and in HG fit the 1970's assumptions quite well, they could seem quite excessive by 1990's/2000's standards. An easy way to fix this issue without changing the actual rules would be to divide the computer tonnage between several computer-related components on the ship's deck plan. I suggest that the actual computer room (complete with peripherals, terminals, access space and so on) should take up only 25% of that tonnage (which is still a very conservative assumption); 50% should go to avionics; and 25% should go to communication, ECM/ECCM and other miscellaneous electronic equipment.

3) LBB2 says that the Stateroom tonnage includes more than just the stateroom itself, but does not give concrete data on this subject. I suggest that the actual Stateroom (3x3x3 meters, includes a bed or a bunk bed, a desk and a fresher) will take 50% (2 dton per stateroom); 18.75% (0.75 dton per stateroom) should go to the ship's Galley and Medlab; 6.25% (0.25 dton per stateroom) should go to the Ship's Locker/Armory; 12.5% (0. 5 dton per stateroom) should go to Life Support; 6.25% (0.25 dton per stateroom) should go to landing gear/fuel

scoops/docking equipment; and 6.25% (0.25 dton per stateroom) should go to Corridors/Passages.

Integrating this Article with Steve Osmanski's Small Craft Design System

Generally speaking, a small craft may mount any component presented here – including armor and weapons – as long as there is enough free tonnage and, if necessary, EPs to accommodate it; beyond that, use your common sense and your imagination. However, there are a few rule suggestions in this field, mostly concerned with weapons and military technology:

1) Small craft have no need for CIC as they can mount no more than three weapons; if you want a small craft to fire at three targets at once, just give it a good computer and multi-target-3 software.
2) Small craft should not be able to mount Missile Tubes (discussed below) as these take up two hardpoints each and small craft may have only a single hardpoint.
3) Only small craft above 50 dton should be able to mount a Heavy Turret.
4) Only **armored** small craft above 50 dton may mount a Light Barbette; no small craft may mount a full Barbette.
5) When adding heavy weapons (such as fusion or plasma) to a small craft design, keep in mind the turret slot rules given below; as a rule, a normal turret/hardpoint may mount only one heavy weapon and one light weapon (laser, sandcaster or missile rack); a heavy turret may mount up to 2 heavy weapons or one heavy weapon and two light ones.
6) There is one component which I wish to add to Steve Osmanski's Small Craft Design System (and LBB2 and HG as well): the **Robot Brain Adapter**, a controller (which replaces a pilot seat/bridge) that allows a robot brain to be plugged into the small craft either as a replacement for the pilot or in addition to a sophont-operated controller. It takes 0.25 dton, costs MCr0.025 per dton of the small craft and may accommodate robots up to 1,400 liters in volume.

Part Two: Solar Panels as a long-term Power Plant
Compiled with the help of Dan "far-trader" Burns

The Power Plants described in Classic Traveller (be it LBB2 or High Guard) use nuclear fusion to generate power. While this process produces extensive amounts of power per dton of power plant or fuel, it has one weakness – it requires hydrogen fuel to operate, and long-term power generation requires large amounts of it. Normally this wouldn't be much f a problem, as most ships dock at starports on a regular basis, but some designs – such as escape pods and space stations – might need to function for years between refueling. For that purpose, a relatively old technology could be used – photoelectric cells, arranged into solar panels. The following stats were adapted from MegaTraveller for use in Classic Traveller's LBB2. For hits during combat, consider the solar panels to be a Power Plant; the first hit at them halves their power production, the second hit renders them inoperative and the third hit makes them irreparable.

Solar Panels by TL

TL	MW	dton	MCr
6	1.4	1	14
7	2.8	1	11.2
8	5.6	1	8.4
9	16.8	1	7
10	37.8	1	5.6
11	63	1	4.2
12+	113.4	1	2.8

Where TL is the Tech Level; MW is power generated in Megawatt/Hour;
dton is displacement tons taken; and MCr is cost in MegaCredits.

Keep in mind that one High Guard Energy Point (EP) equals 250MW; thus, while powering weapons by solar panels is possible, it is not always practical, especially not in the lower tech levels. I have included a table listing the power requirements of various components described in LBB2 or in this article; while detailed power allocation is more in the realm of MegaTraveller and less in that of Classic Traveller, these figures are included to give the designer a general idea of what could be done with the power provided by Solar Panels.

Power required by various Components

Component	MW Required
Basic Life Support (per person)	0.001
Comfortable Life Support (per person)	0.002
Low Berth	0.001
Emergency Low Berth	0.002
Hydroponic Garden	1
Full Hydroponics	5
Laser (Beam or Pulse)	250
Plasma Gun	250
Fusion Gun	500
Model/1 Computer	125
Model/2 Computer	187.5
Model/3 Computer	250
Model/4 Computer	500
Model/5 Computer	750
Model/6 Computer	1,250
Model/7 Computer	1,750
Model/8 Computer	2,250
Model/9 Computer	3,000

Part Three: Hydroponics

The use of hydroponic gardens is a common theme in science fiction; they usually act as both a life-support mechanism (recycling air, water and waste and providing nutrition) and a recreational area of the ship, allowing the crew to relax in a life-filled garden, a small enclave of life in the emptiness of space. There are two versions of hydroponic modules to be included in LBB2 designs (any number may be included per design as much as tonnage and cost restrictions allow):

Hydroponic Garden (TL8): A hydroponic (that is, raising plants in water rather than in soil) garden intended for recreational and decorative use, as well as for limited life support and recycling applications. Comes in 8-dton modules, costing MCr1 each, and includes various plants (ranging from grass to tree-like shrubs), as well as a small fish tank (fish are both decorative and edible) and some recycling equipment. Requires 20kg (Cr5,000) in additional nutrients per year and must be connected to an existing life support system. Though the Garden is not a fully contained life support system, it could still help in waste, water and air recycling and produce some food; therefore, each module reduces the life support costs of 8 persons by 20% (so the life support will cost Cr1,600 rather than Cr2,000 per person per week for these people).

Full Hydroponics (TL8): A full, self-contained ecosystem containing hydroponics, yeast/algae/fish tanks as well as heavy recycling equipment, the Full Hydroponics are, theoretically self sufficient, though nutrient (and other resources) loss requires the addition of 5kg (Cr1,000) of replacements per year of use. Each Full Hydroponics displaces 4 tons, costs MCr2 and could provide complete life support (except for heating and radiation protection provided by power-plant powered systems and the ship's hull, respectively) for two persons for a practically infinite time (as long as nutrients are supplied and the power plant operates).

Note that for both systems, a single dton of cargo space could store 5,000kg of replacement nutrients/materials.

Part Four: Combat Information Centers (CIC) for LBB2
Based on ideas and rules by Sigg Oddra

In the original LBB2 space combat system there is a stiff limit to the number of targets that could be engaged by a single ship in a single turn; even with a high-tech computer and an expensive multi-target-4 program, no more than four targets may be engaged. This means that small fighters may easily overwhelm huge warships; while this fits the small-ship, "fighters-are-relevant" approach taken by LBB2; it is sometimes desired to construct heavy vessels that are capable of engaging multiple targets as once.

To allow such a ship to engage more than four targets at once, install more computers to allow turrets to be directed at 4 targets per computer multi-target-4 program running, and one CIC module (4 dtons, MCr1, 1 crew required) per additional computer installed

For example, a 2000 dton destroyer with a model/7 computer and 20 turrets can only engage up to 4 separate targets. To make it more effective versus fighters and their likes, the architect opts to install a 16 dton CIC and 4 model/5 computers (to run target, multi-target-4, predict-4, gunner interact, and return fire). The destroyer may now fire each turret at a separate target.

Part Five: Armor and Heavy Weapons for LBB2 Ships
Based on ideas and rules by Sigg Oddra

As I've said before, the original, unmodified LBB2 rules create a universe in which there were few differences between a well-armed civilian ship and a military one (as was, historically, during the Age of Sail); as weapons were relatively and readily available, the only real difference between civilian and military ships was in their computers and their sensors; nevertheless, a well-armed civilian ship could still pose a clear threat to a military craft. In an attempt to "up gun" military craft and make them more diverse and interesting (and, of course, more destructive) in their armament, rules concerned with the implementation of High Guard armor rules and of additional weapons are included here.

Armor in LBB2 Ship Combat
It makes use of the heavy turret, barbette and heavy weapon rules presented below, but a referee can ignore all the non-standard weapons and just use the canon ones.

This system uses a 2d6 roll; add to it the weapon's Penetration score (listed below) and subtract the Armor Rating and the Range Penalty from that sum. Consult the following table to determine the number of damage and critical rolls to be made on the Hit Location Tables in LBB2 p.30.

Hit Resolution Table

Adjusted 2d6 Roll	Result
Less than 2	No damage
2-8	1 damage roll
9-12	2 damage rolls
13-16	3 damage rolls
17-20	4 damage rolls
21-24	5 damage rolls
25-28	5 damage rolls, 1 critical hit
29-32	5 damage rolls, 2 critical hits
33-36	5 damage rolls, 3 critical hits

DMs are +Weapon Penetration, -Armor Rating and –Range Penalty

Weapon Penetration Scores

Weapon System	TL	Penetration	Weapon System	TL	Penetration
Single Laser Turret	7	+1	Plasma Barbette	14	+5
	13	+2		16	+6
	16	+3			
Double Laser Turret	7	+2	Single Fusion Turret	12	+4
	13	+3		14	+5
	16	+4		16	+6
Triple Laser Turret	7	+3	Double Fusion Turret	12	+5
	13	+4		14	+6
	16	+5		16	+7
Heavy Laser Turret	10	+4	Fusion Barbette	14	+7
	13	+5		16	+8
	16	+6	PAW Turret	18	+8
Laser Barbette, Light	15	+6	PAW Heavy Turret	16	+7
	16	+7		18	+9
Laser Barbette	14	+8	PAW Barbette, Light	15	+6
	16	+9		16	+7
				18	+10
Single Plasma Turret	10	+1	PAW Barbette	14	+5
	11	+2		15	+6
	12	+3			
Double Plasma Turret	10	+2		16	+8
	11	+3			
	12	+4			

Note: for every damage roll achieved on the penetration table a PAW also roll 1 radiation damage; i.e. a PAW that scores 2 damage rolls also rolls twice on the radiation damage table; Beam Lasers have a -1 DM to penetration.

Missile hits in the armor system presented above

If you are using LBB2 alone, roll 1d6 to determine each missile's Penetration Score; if you are using Special Supplement 3: Missiles, it is recommended that you follow these guidelines:

High Explosive Warhead: +2 Penetration per 10kg of warhead.

Focused Force Explosive Warhead: +3 Penetration for 10kg, +6 for 20kg and +8 for 30kg.

Nuclear Explosive Warhead: +4 Penetration and 1 roll on the Radiation table per 0.1 kiloton of yield.

Enhanced Radiation Warhead: If only an indirect hit is achieved, roll twice on the Radiation table for each 0.1 kiloton of yield; no normal damage is done. If a direct hit (contact) is made, roll on the standard table with +2 Penetration per 0.1 kiloton of yield and roll four times on the Radiation table per 0.1 kiloton of yield.

Fusion Warhead: +6 Penetration and 2 rolls on the Radiation table per 0.1 kiloton of yield.

For direct hits (contact) double penetration, except for the Enhanced Radiation Warhead; for this kind of warhead, see its description above for details

Heavy Weapons and Turret Slots

While the light weapons presented in LBB2 are assumed to be similar in weight and volume and thus take an equal amount of mounting space; however, heavier weapons require larger amounts of mounting space. For that end, Sigg Oddra has developed a system of "mounting slots" per turret and per weapon, from which I've derived the following tables, showing the mounting slots and cost per weapon and mounting slots, tonnage and cost per turret:

Weapon System	Slots Required	Cost in MCr
Pulse Laser	1	0.5
Beam Laser	1	1
Sandcaster	1	0.25
Missile Rack	1	0.75
Plasma Gun	2	1.5
Fusion Gun	2	2
TL14 PAW	8	3
TL15 PAW	5	3
TL16 PAW	4	3

Turret	Slots	TL	MCr	dton
Single Turret	1	7	0.2	1
Double Turret	2	7	0.5	1
Triple Turret	3	7	1	1
Heavy Turret	4	10	2	2
Light Barbette	5	15	8	5
Barbette	8	14	3	3

Notes:

1) If you are not using the Armor system presented above, a Plasma Gun causes two Hits, as a +2 DM to hit below 250mm range, and uses twice the listed laser range penalties; Fusion is treated as Plasma but causes 4 Hits; the Particle Accelerator Weapon (PAW) uses half of the laser range penalties (rounded up), ignores sandcaster penalties and causes 3 normal Hits in addition to 2 Radiation ones.

2) Any hardpoint my mount a Single Turret, Double Turret, or a Triple Turret; only craft above 50 dton may mount a Heavy Turret; only armored craft above 50 dton may mount a Light Barbette; and only armored craft above 100 dton may mount a Barbette.

3) If you are using High Guard-equivalent Energy Points (EPs) in your LBB2 design, a Laser or a Plasma Gun uses one EP; a Fusion Gun uses two EPs; a PAW uses 5 EPs.

Missile Tubes

A Missile Tube is a much heavier version of the Missile Rack; it takes two hardpoints and 10 dtons, costs MCr4 and requires a crew of two to operate. If you are using SS3: Missiles, a Missile Tube may launch missiles up to 500,000kg; if you are using LBB2 alone, it fires a Tube Missile that does 3d6 Hits or a Nuclear Tube Missile that does 6d6 Hits. If you are using the above armor rules without SS3: Missiles, a Tube Missile has 3d6 Penetration and a Nuclear Tube Missile has 6d6 Penetration and calls for 6 rolls on the Radiation table.

Fixed Mounts
Based on Alien Module 6: Solomani

Fixed weapons mounts allow weapons to be attached to hardpoints on a ship and do not require fire control tonnage or a turret. A Fixed Mount has 2 Slots, but each weapon's slot requirement is halved when it is mounted on such a mount. Weapons in fixed weapons mounts are operated by a gunner on the bridge and are subject to an attacker's DM -2 in space combat. A ship is allowed fixed weapons mounts equal to the model number of the computer installed on the ship (for example, Model/2 computer allows two hardpoints to have fixed weapons mounts).

Missile Magazines with Autoloaders
Based on ideas and rules by Andy Fralix

A standard missile or sandcaster magazine can hold up to 140 missiles per dton, and a gunner must reload turret with these missiles manually. An autoloader reduces the magazine capacity to 100 missiles and/or sand canisters per dton to allow for the autoloader mechanisms, loads the turret automatically and each autoloader (each turret/missile tube needs its own autoloader) costs 0.01 MCr, takes 0.1 dton and (if you are using detailed power allocation) consumes 0.1 EP or 25MW. A Missile Tube using an Autoloader needs only one crewmember instead of two.

Part Six: Miscellaneous Components
Designed with the help of Sigg Oddra, Dan "far-trader" Burns and BeRKA

The following ship components are presented in a "modular" design; for larger components, simply multiply the module's base tonnage, cost, personnel requirement and capacity by the number of modules used. Note that the modules are presented here mostly for the sake of convenience; when designing a deck plan, feel free to unite several modules into a single, larger facility.

Bar: A shipboard bar requires one Bartender and may seat up to 12 patrons (though it is usually connected to a larger Lounge). Each module displaces 6 dtons and costs MCr2.

Casino: A luxury gambling hall. A shipboard casino requires three operators and may host 15 gamblers per module. Each module displaces 20 dton and costs MCr5.

Duty Free Shop: A Tax-Free shop, selling various consumer goods to the passengers and the crew requires one salesperson, displaces 10 dtons and costs MCr2.

Extended Medlab: While each ship has a small medical facility subsumed in its stateroom cost and tonnage, some designers may wish to include a larger, better equipped medlab in their designs. An Extended Medlab holds hospital-grade medical equipment and allows for complex medical procedures (such as extensive surgical operations) to take place; it requires one Medic and treats up to two patients per module, displaces 8 dtons and costs MCr8.

Factory: A shipboard factory usually produced one product or a series of related products; the types and amounts of raw materials needed for production are left for the referee's discretion. A Factory Module requires 10 workers, displaces 100 dtons and costs MCr50.

Grav-Ball Court: An arena fit to play most Grav (or Zero-Grav) enhanced sports displaces 40 dtons and costs MCr2.

Karaoke Bar: A Karaoke Bar requires one operator/bartender and may sit up to 16 persons (but usually this will be connected to a lounge). Each module displaces 8 dtons and costs MCr3.

Kitchen (High Class): A kitchen fit to serve rich or noble passengers requires one Chef and one Assistant Chef and may cook meals for up to 50 persons at once. Each module displaces 10 dton and costs MCr5.

Kitchen (Vilani): A Vilani-style extended kitchen requires one Chef and two Assistant Chefs and may cook meals for up to 50 persons at once. Each module 10 dtons and costs MCr10.

Library: A small library combining "hard-copy" and electronic texts as well as other forms of media requires one librarian, may seat up to 5 persons, displaces 10 dtons and costs MCr5.

Lounge: While each ship has a small galley/mess hall subsumed in its stateroom cost and tonnage, this facility provides only minimal services fit for a military, exploratory or cargo ship but hardly enough for a luxury cruiser. A luxury lounge displaces 10 dton, costs MCr2 and may seat up to 20 persons per module.

Machine Shop: A small workshop capable of fabricating some types of spare parts and of repairing equipment; its exact capabilities and raw material requirements are left for the referee's discretion. A Machine Shop requires one skilled worker (with the appropriate skill to the item being produced/repaired), masses 10 dtons and costs MCr5.

Mass Driver: A large magnetic rail-launcher designed for slinging cargoes over interplanetary distances. A mass driver is too slow and inaccurate to be used in ship combat, but may be used as a planetary bombardment weapon. It requires a crew of four, displaces 25 dtons, and costs MCr26.

Ore Processing Bay: This huge refinery is capable of processing most compounds found in planetoids into semi-refined raw materials which could easily be shipped to other locations. It requires 40 workers, displaces 400 dtons, and costs MCr250.

Scientific Laboratory (Advanced): A full-scale, high-tech laboratory easily reconfigurable for various scientific needs; it can also be used as a general-purpose lab onboard an exploratory ship. Each module requires one scientist or lab-tech displaces 16 dtons and costs MCr16.

Scientific Laboratory (Simple): A basic, general-purpose lab designed for frontier use. Each module requires one scientist or lab-tech displaces 8 dtons and costs MCr5.

Spa: A smaller version of the swimming pool, the Spa requires two operators, may bath up to 15 persons at once, displaces 10 dtons and costs MCR5.

Swimming Pool: An onboard swimming pool, including filtration systems and an airlock to prevent leaks in the event of shipboard gravity failure, displaces 12 dtons and costs MCr1.

Restaurant (excluding kitchen): A high-class restaurant requires 4 waiters and may seat up to 40 persons. Each module displaces 20 dtons and costs MCr5.

Vehicle Workshop (Full): A workshop capable of performing virtually any kind of vehicle work (including overhauls, and turret or power plant replacement) requires two Mechanics, displaces 200% of the tonnage of the largest vehicle it could repair and costs 200% of the price of the most expensive vehicle it could repair.

Vehicle Workshop (Minimal): A workshop capable of doing small-scale repairs to vehicles requires one Mechanic, displaces 110% of the tonnage of the largest vehicle it could repair and costs 110% of the price of the most expensive vehicle it could repair.