

# The Renegade Mage's Technomancer Power & Weapons, 4<sup>th</sup> Ed.

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## Power Sources

In 3<sup>rd</sup> edition *GURPS Technomancer*, it was stated that mana engines (and elemental furnaces) used the rules in *GURPS Vehicles*. However, that didn't actually work, because as published in *Vehicles*, a mana engine of 5 or more kilowatts was priced at  $$(kW+5) \times 250$  before enchantment, with an additional enchantment cost of 100 energy points per kW (300 for an elemental furnace). If we assume the 1984 timeline entry's Ford-Manadynamics *Spectre* had the same engine power as the V6 model of real-world 1985 model year Ford Taurus (160 hp/104 kW), a mana engine that was merely rather expensive (\$27,250) became utterly unaffordable (10,400 energy, at \$100/point industrial enchantment, is \$1,040,000). The obvious move is to simply eliminate the additional enchantment cost; the *Spectre* then becomes akin to a real-world electric car in price.

However, if we do nothing but eliminate the separate enchantment cost, then mana engines become *far* too good a deal for continuous electricity production. \$250 million for a 1 gigawatt power plant that runs 24/7 without fuel, maintenance, or moving parts is an absolute bargain, and would drive all other power sources out of business. Indeed, one might see the end of power grids entirely; a 5 kW home generator would easily cover any reasonably-normal power use forever, while running a one-time cost of \$2,500. We want mana engines to be reasonable as vehicular motive power; we don't want them making all electrical generation (except maybe NEMA for enchantment) obsolete.

Accordingly, the following rules apply to mana engines and elemental furnaces:

1. The engine cannot power anything more than  $\sqrt{kW}$  yards away. Directly attached wires see the engine-provided voltage go to zero at that distance; physical linkages beyond the distance (like an extended driveshaft attached to an electric motor powered by mana engine) don't work. This is a matter of the magic; things work as one would expect *except* that there is no way to power things beyond the  $\sqrt{kW}$  radius, no matter how clever the attempt.
2. The engine requires a dose of paut for every 150,000 kWh of power generated. For a 100-kW (134 hp) engine in a car driven two hours a day, that's approximately one dose every two years. For an 80 MW container ship's engine, that's about one dose every two hours of operation.

Note the power transmission radius given is sufficient for automobiles, motorcycles, propeller aircraft, and ships (all applications of the mana engine mentioned in the original Technomancer book). It is not sufficient for utility electrical power generation or freight trains (since they can't be long enough to be economically efficient), but neither of those were called out as using them.

While default 3<sup>rd</sup> Edition mana engines and elemental furnaces only came in one power-to-weight ratio at one cost, it seems reasonable enough to allow some variation.

## Mana Engines Table

Type	Cost	Weight	Volume
<b>Elemental Furnaces</b>			
Standard Furnace	$$(kW+5) \times 125$	$(kW+5) \times 25$ lbs.	$(kW+5) \div 2$ cubic feet
Lightweight Furnace	$$(kW+5) \times 150$	$(kW+5) \times 20$ lbs.	$(kW+5) \div 2.5$ cubic feet
<b>Mana Engines</b>			
Very Low Power Engine	$$(kW+5) \times 175$	$(kW+5) \times 16$ lbs.	$(kW+5) \div 3$ cubic feet
Low Power Engine	$$(kW+5) \times 200$	$(kW+5) \times 12$ lbs.	$(kW+5) \div 4$ cubic feet
Reduced Power Engine	$$(kW+5) \times 225$	$(kW+5) \times 8$ lbs.	$(kW+5) \div 6$ cubic feet
Standard Engine	$$(kW+5) \times 250$	$(kW+5) \times 5$ lbs.	$(kW+5) \div 10$ cubic feet
Lightweight Engine	$$(kW+5) \times 500$	$(kW+5) \times 4$ lbs.	$(kW+5) \div 12$ cubic feet

## Elemental Propellant Slugthrowers

A neat concept included in the Pyramid “Technomancer Designer’s Notes” but not in the official setting (for example, *GURPS Time Travel Adventures*, *Technomancer*, and *Technomancer: Funny New Guys* all have the real-world M-16 listed as the U.S. rifle, not the Notes’ M-66), the elemental propellant slugthrower (EPS) is here revived and adapted as a post-1998 invention in Merlin.

The primary difference between a conventional firearm and an EPS is that an EPS does not use cartridges with primer and power to propel a bullet. Instead, the EPS has bound water and fire elementals that, with a pull of the trigger, are partially combined in the weapon’s chamber to produce steam, the bullet then launched by the steam. This saves substantial weight and bulk per round, but the elementals get tired and eventually must be rested. Every full ten minutes the elementals get to rest (or per fatigue point fed the chamber by magic), they regain the ability to fire 10% of the weapon’s total shot capacity.

To convert a published GURPS small arm into an EPS equivalent, apply these formulas:

**Shots Per Magazine:**  $\times 6$  for rifle calibers,  $\times 2.5$  for pistol calibers and shotguns.

**Weight & Cost Per Shot:**  $\div 3$  for rifle calibers,  $\div 2$  for pistol calibers, shotguns, and grenades.

**Enchantment Cost:**  $(\$172 \times [\text{Number of Damage Dice}]) + \$115$

**Shots Before Exhaustion:**  $[\text{Weapon Type Value}] \div [\text{Number of Damage Dice}]$

For *Damage Dice*, each  $\pm 1$  after the d equals  $\pm 0.25$  dice. Convert shotgun damage to rifled slugs for use in the formula; 40×46 mm grenade launchers use 4d. A weapon above 8d cannot become an EPS.

The *Weapon Type Value* is 1250 for a rifle, 1180 for a carbine, 1120 for a submachine gun or shotgun, 1050 for a handgun, and 960 for a 40×46 mm grenade launcher. *Weapon Type Value* reflects that less of the force of the steam creation is applied to the round in shorter barrel ratio weapons.

Round the *Shots Before Exhaustion* value to the nearest ten.

The shots before exhaustion numbers are reverse-engineered from the values given in the Pyramid “Technomancer Designer’s Notes” for the M-66 rifle and M-7 pistol. The Enchantment Cost is similarly based on those weapons, plus the per-hour Q&D wage used in my Technomancer Item Price Tables PDF.

## The New Weapons of the EPS Era

Most guns available as EPS are fairly straightforward adaptations of conventional firearms to the new magitech action. However, there have also been a number of divergent designs built from the ground up to take advantage of the new capabilities; a few of the more successful follow.

### *IWI Desert Roc, .666 AE (Israel, 2004-)*

The Cult of Bigger Holes looked at elemental propellant slugthrower magitech, and went, “Hey, now that we don’t have to carry around propellant, you can make the bullets even bigger!” Israeli Weapons Industries, the makers of the (in)famous Desert Eagle, heard them and answered with this monster of a handgun. The company was able to convince the A3TF to classify the Desert Roc as a sporting arm (“mostly useful for target shooting and handgun hunting, plus maybe hiker self-defense from bears”), making it exempt from the usual issues around a weapon of larger than .50 caliber.

The Desert Roc can fire 200 rounds before exhaustion, which is more than can be said for its users.

### *Lilith Equalizer, 6.4×12mm (USA, 2004-)*

An “itty-bitty gun” for concealed carry, the Equalizer’s notable features are its one-hand operation, its integral targeting laser, and its lack of a detachable magazine. For the last, it instead relies on the 165-round capacity of its Hideaway-enchanted internal magazine. The marketing from the Lilith Self-Defense Cooperative, LLC emphasizes the Equalizer’s light weight and easy concealability as making it particularly appropriate for women’s self-defense.

The gun can theoretically fire 1050 rounds before exhaustion, but reloading takes so much time that the limit is hard to reach even under artificially idealized conditions.

### *GUNS (Pistol) (DX-4 or most other Guns at -2)*

TL	Weapon	Dmg	Acc	Range	Wt	RoF	Shots	ST	Bulk	Rcl	Cost	LC	Notes
8	IWI Desert Roc, .666 AE	5d+1 pi+++	2	450/2,800	4.9/0.9	3	9+1(3)	13	-4	4	\$2,270/\$45	3	200R
8	Lilith Equalizer, 6.4×12mm	1d pi-	0	90/950	0.9	3	165(3i)	5	-1	2	\$790	3	1050R

### *Ballester SADD, 10G (Argentina, 2017-)*

The Supresor Automático de Disturbios (“Automatic Riot Suppressor”) from Argentina’s Grupo de Armas Ballester is a selective-fire EPS shotgun in ten gauge, sold to military and police customers around the world. The SADD can shoot 210 rounds before exhaustion.

All of the exotic loads in *High-Tech* (p.103) can be packaged to fire from the SADD. Except for the APDS, the stats in that book are close enough, but *all* rounds do cycle in the EPS auto-loader.

#### *GUNS (SHOTGUN) (DX-4 or most other Guns at -2)*

TL	Weapon	Dmg	Acc	Range	Wt	RoF	Shots	ST	Bulk	Rcl	Cost	LC	Notes
8	Ballester SADD, 10G	2d-1 pi	3	40/800	15.6/2.8	6×9	25+1 (3)	12 <sup>†</sup>	-6	1/4	\$2,600/\$32	2	210R
	...with APDS slug	7d(2) pi+		150/1,800		6				4			
	...with SPDN slug	5d+1(2) pi+		100/1,200		6				4			
	...with SPDSN slug	8d(2) pi+		150/1,800		6				4			

### *Sahu M6 Jadis, 6.8×36mm (USA, 2011-)*

Shortly after the invention of the elemental propellant slugthrower in 1999, the United States Army cancelled the Objective Individual Combat Weapon competition. The replacement competition started in 2001 had deliberately loose criteria in order to give weapons-makers the space to explore the possibilities of the new EPS technology, and over a dozen wildly divergent proposals came in.

In the end (rather defying expectations), the Army selected what was one of the more radical proposals, the Sahu Tactical Systems Jadis. A bullpup carbine with a chamber pressure of 80,000 psi firing a 6.8 mm bullet, it has the same overall length as the M4 carbine, better penetration than an M14 rifle, and (thanks to a “float” system similar to the H&K G11) the same felt recoil as an M16 rifle. Its four-position selective fire lever allows the user to choose between safe, single-shot, three-round burst, and full-automatic firing modes. The Jadis can shoot 160 rounds before exhaustion.

Adopted into service as the M6 in 2011, early production models had a variety of teething troubles and wear issues, and it took time for the U.S. military to adapt to a weapon with such a radically different manual of arms. After these early kinks were worked out, it gained a reputation for both lethality and ease-of-use, though it still wears out its barrels quickly by the standards of other military carbines.

In U.S. Army and Marine rifleman companies, everyone with an M6 is issued one Hideaway-enhanced magazine holding 130 total rounds (\$1,310) at no increase in weight, to allow extended covering fire in lieu of issuing squad automatic weapons. Troops in other assignments who carry the M6 are often issued a 79-total-round Hideaway magazine (\$422).

#### *GUNS (RIFLE) (DX-4 or most other Guns at -2)*

TL	Weapon	Dmg	Acc	Range	Wt	RoF	Shots	ST	Bulk	Rcl	Cost	LC	Notes
8	Sahu M6 Jadis, 6.8×36mm	7d+2 pi	5	700/5,200	10/1	9#/14	28+1(3)	10 <sup>†</sup>	-4	2	\$3,900/\$35	2	160R

### *Productos Mendoza Alacrán, 7.65×10.4mm (Mexico, 2008-)*

The theory behind the Alacrán (Spanish for “Scorpion”), at least according to the manufacturer, is that a beat cop walking the street, faced with a car driving by with cartel enforcer shooting a submachine gun out the window, should be able to return the same volume of fire from the weapon he drew from his holster. Accordingly, Productos Mendoza sat down and designed a compact EPS machine pistol around a de-cased .32 ACP round. The similarity in round and holster-carrying to the CZ Skorpion (*High-Tech*, p.125) inspired the name, though the two guns have little in common mechanically.

The three-round burst setting (in addition to safe, single-shot, and full auto) is the manufacturer’s answer to worries about the round’s stopping power. The Alacrán can fire 640 rounds before exhaustion.

Statistics in the table are with the factory-standard magazine, but it’s unusual for users to not buy a magazine extended with no-encumbrance Hideaway. The one-pound-extended magazine holds 140 rounds and costs \$415; the two-pound-extended holds 256 rounds and costs \$1,300.

There’s an attachable wire folding stock (included with purchase, but not attached by default).

#### *GUNS (SMG) (DX-4 or most other Guns at -2)*

TL	Weapon	Dmg	Acc	Range	Wt	RoF	Shots	ST	Bulk	Rcl	Cost	LC	Notes
8	PM Alacrán, 7.65×10.4mm	2d-1 pi-	2	90/1,000	3.5/0.4	9#/16	24(3)	8	-2	3	\$920/\$25	2	640R
	...with stock attached				3.7/0.4			7 <sup>†</sup>	-3*	2			

## Steam Cannon

Exhaustion limits prevent the use of EPS in heavy automatic weapons that have to be capable of long sustained fire. At the same time, the limits of ectitic containment chambers, safe elemental binding, and enchanter exhaustion prevent the use of EPS in weapons past 8d. However, the advantages of eliminating the need for propellant are obvious, so of course work has been done on creating the equivalent for other guns with non-EPS technology.

In many cases (such as for heavy machine guns and autocannon), this hasn't been successful, but for large cannon, the Boil Water spell (actually developed after the invention of the EPS) works fairly well. Its major drawback is the ten-second casting time, but four points of the Speed enchantment drops that to 0.625 seconds. So, for 8,800 energy, one can combine Create Water, Boil Water, two Links, four points of Power, and four points of Speed, to create then boil up to two gallons of water in a large gun's chamber in 0.6875 seconds when activated. That's expensive, but the reduced per-round cost of ammunition, lower logistic mass burden, and greater resistance to ammunition cook-off is seen as worth it – particularly for tanks, self-propelled howitzers, and the 20-inch guns on the US Navy's modern battleships. (When converting to steam, the US Army added 1mm to official gun sizes to avoid ammunition mix-ups during the transition, even as tube sizes stayed the same.)

If you need more than two gallons of water turned into steam to propel your payload, you can have the Link on the Create Water set to trigger additional times per firing cycle, creating and boiling up to 4 gallons of water into steam in 0.75 seconds, up to 6 gallons of water into steam in 0.8125 seconds, or up to 7.48 gallons of water (to the 1 cubic foot limit of Create Steam at 4 points of power) in 0.875 seconds, without increasing the enchantment cost.

Various militaries have tested various steam conversions of soldier-portable mortar systems; the universal conclusion has been that the expense per mortar could not be justified.

## Golem-Piloted Vehicles

The phaseout of rodent-piloted vehicles (originally described in *Technomancer*, p.50; phaseout in Pyramid 3/115, "Eidetic Memory: Merlin Declassified", p.25) was not purely driven by public attitudes. In large part, it was because the military decided it had something better than possessed rodents; six-inch-tall golems. Let the aircraft's pilot fire the missile and forget about it; the SM -6 salt golem with Piloting (Vertol)-17 in the missile can follow orders to direct it to the target.

Of course, a very similar system directs the modern Autonomous Aerial Vehicle, or "drone". The mana engine gives the drone unlimited endurance, while the golem with Electronics Operation (Sensors)-11 and Piloting (Light Airplane) or (Ultralight)-15 can carry out orders, instead of the drone requiring constant piloting by a remote operator.

## Lighter-Than-Air Vehicles

The Heat spell can provide fuel-free heating for hot-air craft, while Create Fuel can produce hydrogen that can be used as lift gas. This has resulted in various experiments with hot-hydrogen dirigibles (with Fireproof on the envelope to reduce the burning hazard) that can maintain indefinite flight by replenishing their own lifting gas losses.

In practice, the various proposed commercial applications haven't gotten far. Though somewhat superior to real-world lighter-than-air platforms, in Merlin they have to compete with flying carpets, much cheaper space access, and even cheaper-to-fuel helicopters (between oil prospecting and extraction being cheaper and demand for oil being lower). The result has been a commercial dead end.

However, scientific research instruments do fly on hot-hydrogen balloons reasonably often. It is also believed that intelligence agencies around the world use "cold" (that is, non-Heated) self-replenishing hydrogen balloons enchanted with Invisibility for espionage. (Though the Invisibility spell would hide the balloon itself from infrared detection, leaking hot hydrogen would light up thermal imaging systems.)

## Flying Conveyances

Edition changes result in some modifications to the flying conveyances in *Technomancer* (sidebar, p.105). Also, many new example conveyances have been added.

1. Alfombras de Juárez *Stratus*: High-end 20-square foot “elite sportscarpet”. Power 19 (38 mph). DR 12/5\*, HP 20. \$361,500, 15 lbs.
2. Anáhuac *Burro*: Commercial 200-square foot “2½-ton skytruck”. Power 15 (30 mph). DR 12/5\*, HP 43. \$1,095,000, 150 lbs.
3. Anáhuac *Burro Grande*: Commercial 400-square foot “5-ton skytruck”. Power 15 (30 mph). DR 12/5\*, HP 54. \$2,110,000, 300 lbs.
4. Axminster Carpets *Leyline*: A twelve-seat, 96-square foot “shuttle carpet”. Power 15 (30 mph). DR 12/5\*, HP 33. \$567,200, 72 lbs.
5. Boeing *Witchcraft*: One-seater (200 lbs. capacity) “broomstick” with handlebars and a speedometer. Power 16 (32 mph). DR 3, HP 7. \$144,200, 5 lbs.
6. Bombardier *Lear Arrow*: Luxury very-high-speed 8 passenger, 64 square foot carpet. Power 30 (60 mph). DR 12/5\*, HP 30. \$5,205,000, 50 lbs.
7. DeHavilland *Patroller*: A fast one-seat (200 lbs. capacity) police patrol or military scout “broomstick” with Missile Shield†. Power 19 (38 mph). DR 3, HP 7. \$328,200, 5 lbs.
8. DeLorean *LAC-12 Martin*: A 600-pound capacity (24 square foot) ultra-high-speed light attack carpet with Missile Shield†. Power 44 (88 mph). DR 12/5\*, HP 23. \$5,441,800, 24 lbs.
9. DuPont *Ghostrider*: The still-popular original 16-square foot “sportscarpet.” Power 17 (34 mph). DR 12/5\*, HP 18. \$225,200, 12 lbs.
10. DuPont *LUC-1W “Lucky”*: A 48-square foot military “light utility carpet” with Missile Shield†. Power 15 (30 mph). DR 12/5\*, HP 27. \$363,900, 39 lbs.
11. DuPont *Rug-Ranger*: The civilian version of the LUC-1. Power 15 (30 mph). DR 12/5\*, HP 27. \$323,900, 39 lbs.
12. DuPont *Sinbad*: A common commercial 80-square-foot “one-ton skytruck”. Power 15 (30 mph). DR 12/5\*, HP 31. \$486,000, 60 lbs.
13. DuPont *Vizier*: The original “family carpet”, 32 square feet. Power 15 (30 mph). DR 12/5\*, HP 18. \$241,200, 12 lbs.
14. GAZ *Baba Yaga*: Heavy one-seat (300 lbs. capacity) iron-bound wooden “mortar” from Russia. Power 15 (30 mph). DR 4, HP 42. \$140,000, 140 lbs.
15. IAME *Gaucha*: One-seat (200 lbs. capacity) “commuter broomstick” from Argentina. Power 15 (30 mph). DR 3, HP 7. \$120,200, 5 lbs.
16. Kay-Moreve *Steppenwolf*: Twelve-ton accelerated military airlift carpet (960 square feet). Power 19 (38 mph). DR 12/5\*, HP 72. \$9,832,000, 720 lbs.
17. Lockheed *Stormcloud*: A sportier model of “family carpet” (32 square feet). Power 16 (32 mph). DR 12/5\*, HP 18. \$298,200, 12 lbs.
18. Sikorsky *Skyshadow*: A “one and a half-ton” heavy carpet (128 square feet). Power 15 (30 mph). DR 12/5\*, HP 37. \$729,600, 96 lbs.
19. Sikorsky *Sky Titan*: A 3,200-square-foot “reinforced heavy lift carpet”, able to carry a maximum-weight ISO shipping container and pilot (40 tons). Power 15 (30 mph). DR 15/8\*, HP 107. \$16,320,000, 2,400 lbs.
20. Southern Aeronautical *Firebolt*: One-seater (200 lbs. capacity) “Formula VI” competitive racing broomstick. Power 25 (50 mph). DR 2, HP 5. \$1,920,000, 2 lbs.

\*Split DR: use the first, higher DR against piercing and cutting attacks; use the second, lower DR against all other damage types. Vehicle itself is immune to crushing damage.

†Spell protects vehicle and occupants; energy cost to cast and maintain are ×1.5 for the DeLorean LAC-12 and ×2 for the DuPont LUC-1W.



## United States Military

### Air Force

The branch of the American military whose vehicles have been least transformed by magic is the Air Force. Although there have been various failed experiments (like the Bell XF-109 “Foo Fighter”, a saucer-shaped design that used the Flying Carpet spell for lift and jet engines for fast maneuver, and which ripped itself apart with the interactions), the modern Air Force uses fundamentally conventional aircraft designs that incorporate secondary enchantments.

### Army

#### Aviation

Army Aviation was utterly captured by magic long ago. A Kay-Moreve Steppenwolf flying carpet has the same payload capacity as a CH-47 Chinook, with a lower acquisition cost, requiring no maintenance, consuming no fuel, having infinite range, and needing far less training to operate safely. With the creation of the Army Aviation Branch in 1983, the branch insignia was dragon wings flanking a flying carpet. After the budget cutbacks of the 1990s, Army Aviation is now entirely dragons, flying carpets, and some mana-engined propeller aircraft (including drones).

The DuPont LUC-1W remains the workhorse combat carpet of Army Aviation as it has been since the Vietnam War, often carrying a GE M134 “Minigun” (*High-Tech*, p.134) and a small mana engine to power it. The DeLorean LAC-12 Martin, almost always equipped with the GE M214 “Microgun”, is the fastest carpet in the Army’s inventory, swooping in and dealing death at 88 miles per hour.

#### *GUNNER (MACHINE GUN) (DX-4 or other Gunner at -4)*

TL	Weapon	Dmg	Acc	Range	EWt.	RoF	Shots	ST	Bulk	Rcl	Cost	LC	Notes
8	GE M214 5.56×45mm	5d pi	5	500/3,500	33/84	33!	1000(3)	18M	-6	2	\$6,600	1	V. reliable

#### Ground Vehicles

The M2 Westmoreland Magical Infantry Fighting Vehicle (Pyramid “Technomancer Designer’s Notes”) in 1982 proved the new mana engine for Army use, and the large military budgets of the Reagan Administration financed the conversion of the Army from fossil fuels. In the 21<sup>st</sup> Century, there isn’t a single vehicle in the Army inventory that uses petroleum-based fuel.

The M1C1 Abrams (the A marked the transition from 105mm to 120mm cannon, the B the swap from the gas turbine to a mana engine, and C the replacement of the conventional cannon with the magic “121mm” steam cannon) is the Army’s main battle tank. Standard crew nowadays is a human commander, two reduced-scale crystal (salt) golems (SM -1, ST 15, 470 energy) serving as gunner and driver, and a reduced-scale titanium golem (SM -1, ST 30, 798 energy) serving as loader. All the golems have Soldier-9; the gunner has Gunner (Cannon)-17 and Gunner (Machine Gun)-17, the driver has Driving (Tracked)-17, and the loader has Mechanic (Tracked Vehicle)-12.

The M8A1 Pool Armored Gun System is the US version of the Stingray light tank. During the post-Cold War budget cutbacks, Congress told the Army it could either buy the in-production Stingray (Cadillac Gage sold several hundred of the mana-engined light tank to SEATO member states starting in 1987) or go without an Armored Gun System. The Army saluted and named its new system after WWII “tank ace” Lafayette G. Pool. The “A” revision marks the replacement of the original 105mm cannon with a very short, heavily muzzle-braked 121mm steam cannon firing the same rounds as the steam Abrams (at a lower velocity). Standard crew is the same human-and-three-golems as the Abrams.

### Marine Corps

The Marines, like the Army, have switched to mana engines for ground vehicles. A recent force realignment caused Marine tank battalions to replace their M1C1 Abrams with the M8A1 Pool. At a loaded weight of 30 tons even with enhanced-survivability armor appliqué, the Pool light tank can be carried one to a Sikorsky Sky Titan or two to a Navy LCAC, while the Abrams is too heavy even at one to an LCAC.

Like Army Aviation, the Marines use dragons and flying carpets rather than helicopters or tilt-rotor aircraft. The Corps has retained land-based fixed-wing jet aircraft; with the elimination of naval aviation, Marine pilots and maintenance crews are now trained by the Air Force.

## United States Navy

Deployment of nuclear reactors on US ships was halted in 1956 with the loss of the *USS Nautilus*, throwing a wrench into US plans to build unlimited-range submarines and aircraft carriers. However, the issue didn't last long; the Navy had a research team that was looking into the possibilities of magical propulsion. Driven by the impetus of Khrushchev's 1960 speech creating the perception of a "Spell Gap", the *USS Enterprise* was converted during construction to use elemental furnace powerplants.

The concept proven by the *Enterprise*, the elemental furnace became the standard power plant for all US Navy vessels, both new construction and as refits. This seriously reduced the logistical tail needed to support US warships, though fleet oilers remained necessary to support naval aircraft. With operational costs reduced, budgets stretched to a larger navy; with nuclear weapons a non-factor in warfighting strategy (and neither naysayers talking about surface ship vulnerability to them nor ballistic missile submarines competing for funds), that translated into a much larger number of carrier battle groups.

The golden age of the carrier navy dimmed in the mid-1970s, between the advancements of teleportation magic as a spinoff of the space program and the development of the necronium bomb. The new *Ohio*-class strategic submarine (with a NEMA reactor, energy-assisted Teleport Other rods [EATRs], and rack of necronium bombs) sucked up much of the funding the Carrier Mafia wanted for constructing the new *Nimitz* class. The Reagan Administration wasn't much help, focusing on making new *Ohio*-class SSTNs to match Soviet construction and the new *Rickover*-class SSKs (an evolution of the *Los Angeles* class with new smaller-and-quieter mana engines replacing elemental furnaces) to hunt Soviet SSTNs.

The end of the carrier navy, however, came in the 1990s. Oh, the reduction of defense expenditures with the end of the Cold War was a problem, but it wasn't an existential threat. The problem was the combination of remote viewing technology (both direct magical sensing and live-feed cameras on satellites, drones, and spy balloons) with EATRs. Aircraft carrier flight operations could now easily be shut down; with an eye on the target, someone even on the other side of the planet could drop bombs on a carrier deck. Teleport Shield was little help; the foe could just target a few yards up and let the bombs fall, or perhaps teleport a self-steering bomb a bit up and to the side. This was thoroughly demonstrated by rains of Serbian bomblets on carrier flight decks in the 1998 Kosovo War.

The result is that in the 21<sup>st</sup> Century, the US Navy is now largely out of the aviation business. The submarine, cruising at a depth of 200 feet to avoid detection by Water Vision-enhanced eyes, ready with an array of cruise missiles, torpedoes, and teleportable bombs, is the core of the modern navy. To show the flag, however, the navy does operate a few battleships. Armored against reasonably-sized teleportable bombs, equipped with anti-missile defenses, and relying on the Air Force or Marines to provide air cover, a battleship's guns have the advantage that they can potentially bombard targets with magic-inert depleted necronium shells (which Teleport Other can't).

The *Iowa*-class ships were re-activated in 2000 and 2001, to serve while new battleships were built; when the new *John F. Kennedy* becomes operational, the last one will be re-retired. The first of the new NEMA-powered BBN series, *USS Ronald Reagan*, was converted from a *Nimitz*-class carrier during construction, and the next three followed its basic design, with twelve 20-inch guns in four 3-gun turrets and no secondary battery. The *USS Enterprise*, first of a new BBN class designed from the ground up as battleships but with the same basic armament as the *Reagan* class, began construction in 2022. The official Navy plan is to build four of the new class to bring the number of battleships to eight.

## Space Force

The Space Force is primarily concerned with teleportation and facilities reached by teleportation. Teleport-delivered NEMA warheads are in its remit (except those on Navy ships), as are military space platforms and their kinetic-kill weapons. The Space Force also operates a number of "space tugs" (*Technomancer*, p.105).