

# ORN/ORA A279B2

General-Purpose Power Armor

## History and Background:

The second model in the A279 series the B2 revision was done as a stop-gap measure to upgrade the B1 revision so it would be at least mildly competent in the newly discovered modern battlefield before the A279C and F303 enter production sometime in 104PR. Since it was a rush modification, it only differs from the B1 in a few areas, primarily in its heavier, more military oriented weaponry and in the area of shielding to protect it from the prevalent scalar weaponry. With the model blueprints and most of the functional units leaving with the Occhestan exodus in mid-PR103 it is expected to remain the front-line armor with that group for some time until the C-model phases it out.

## About the A279B2:

The armor is entered by a clamshell mechanism that hinges part of the back out to allow the user to enter the chest. The joint has incredibly strong locking mechanisms and is molecularly sealed to remove any handholds that might allow an opponent to force it open in combat. The helmet must be removed prior to entry and is locked to the suit during use by a intricate network of myomer bundles and high-strength cable armatures (which also prevent the heading from turning to a dangerous degree) and is molecularly sealed to the armor body. The user's legs are in the upper portion of the armor legs with the feet ending slightly above the lower leg joint. The user's arms similarly are in the armor arms stopping about halfway between the elbow and wrist. The suit has a interface port on the back of the pilot compartment that interfaces with the A37/A38 suit that is the standard pilot uniform and allows the armor's recycling systems to work with the suits, greatly increasing user endurance. The inside of the suit is coated with a layer of rubber shock absorbing material.

Power is supplied to the suit by 5 CTA nodes, one in each thigh, one in the lower back and two near the shoulders. Due to the extremely high efficiency of A279's systems it does not require any sort of dedicated radiation system, though it does have a small unit pointed downwards on at the base of back for use in planetary operations. In vacuum the armor can vent all of its waste heat passively through surface its surface.

The 4 fins on the back contain the armor reactionless thrust system, with the thrust of each one (and angle of thrust to a degree) controlled by the armor's computer to achieve controlled flight. The nodes do not have the thrust (by a combination of complications) to achieve anything near the speed seen in most modern armors, though this is to be rectified to a degree on the upcoming C model. The drives can also be coordinated to provide for long, leaping bounds that allow the armor to achieve very high ground speeds.

The right forearm contains the CHANAG unit, fired through a small lower-density patch of armor

(reinforced behind the weapon) that allows the neutron beam to exit with extremely little interference. The left forearm contains the LEAC weapon, which is also fired through a patch of specially designed, selective transparency armor that allows the ionizing laser to fire through it. The armor surface itself acts as the electrode. The back has a hardpoint to support a backpack unit and the outer side of each lower leg contains a hardpoint for optional mountings. No items can be mounted on the shoulders since they would interfere with the VFHAL system.

## Appearance:

A rather hulking armor, the A279 stands over 3 meters high. The leg assembly is a recurve/hybrid design (i.e. it has two joints between hip and ankle, 1 bending backwards, the other forwards; think of the Protoss) with a 4 toed, highly articulated feet. 3 toes point forward with the forth pointed rearward. Each toes has a 10 cm retractable monomolecular blade at the tip and the underside is covered by molecular adhesion pads allow them to grip nearly any surface.

The hands have 4 fingers in a standard configuration (1 opposing the others) with each finger possessing 4 highly flexible joints and a 4cm retractable monomolecular blade at each tip. The inside of the hand is covered in molecular adhesion pads much like the feet, vastly increasing grip on carried weaponry and during climbing. The arms are slightly longer than standard proportions and the armor plating extends a short distance on either side of the elbow to increase protection. Each forearm also has a set of 2 65 cm monomolecular retractable blades towards the wrist. The armor has abnormally large shoulders, extending out over the arm to increase the surface area of the VFHAL system. The head does not have any viewport but has several sensor nodes on either side and 2 pairs of "eyes" (placed for reason of psychology and intimidation). The head has a nearly full range of motion though it restricted at the extremes of motion on either side due to the cowl at the back of the head. The body is rounded and rather bulbous with a armored skirt extending a short ways to cover the hip and upper leg area. On either side of the back are two sets of thick, rounded fins, the top one points up and slightly out and the bottom one points down and out.

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<http://www.deviantart.com/deviation/45883911?qo=46&q=by%3Ajager375&qh=sort%3Atime+-in%3Asc&aps> for something similar to what the suit would look like.

## Statistical Information:

- Government: OCG
- Organization: [b]OSF, ORN, ORA
- Type: General Purpose Medium Power Armor
- Class: A279
- Designer:
- Cabinet of Science & Technology

- Cabinet of Industry
- Manufacturer: Cabinet of Industry
- Date of Initial Requisition: 97 PR (A279B1), 103PR (A279B2)
- Crew: 1 Pilot
- Maximum Capacity: 1

## **Dimensions**

- Length: 0.76m
- Width: 1.14m
- Height: 3.04m
- Mass: 740.5 kg

## **Speeds:**

- STL: 35G
- FTL: No integral FTL capability
- Atmosphere:
- 1,511.89 kph (sea level)
- 6,747.17 kph (25 km)
- Ground:
- 145.75 khp (actuator only)
- 291.52 kph (assisted by thruster array)
- Water:
- 29.61 kph (actuator only)
- 63.30 kph (assisted by thruster array)

## **Range:**

The suit is powered by a CTA system and therefore has essentially infinite range, limiting it to whatever the user can endure. With the A37suit and the A279's own assistance a average user can be supplied with nutrients and water for up to 5 weeks without any additional supplies from the standard stores. The armor can break down molecules to extract oxygen so the suit can recycle oxygen for a effectively indefinite period. Since the suit can extract and process waist and keep the user comfortable, there is no

need to leave the armor even during a long duration mission.

## **Lifespan:**

Properly supplied with materials and properly maintained, the A279B2 has 30 year lifetime, though the upcoming A279C and F303 armors are expected to totally replace it long before then.

## **Offensive Systems:**

### **Variable-Frequency Phased Array Laser [VFHAL]**

Each of the shoulders of the A279 is covered by a quantum dot based phased array system. The arrays have been included in all models of the A279 and were designed to give the armor an offense and defense able to deal with multiple threats at any one time. The arrays are placed under the HECAC armor and the fire control systems are precisely calibrated so that the beams can still accurately fire even through the heavy distortion of the armor (though this means the beam emitted by the array may be at a significantly different angle than the beam that fires from the armor). Note that the reverse is not true (any such defective panels are not used).

The system can generate a beam varying in frequency from very-high energy X-ray (bordering on gamma rays) to radio frequencies. This allows it to act as a lethal (in IR and above frequencies) and as a non-lethal incapacitate (in the microwave and radiowave frequencies). Low power emissions can also serve as a sensor system throughout its emission spectrum (though use as a XADAR is not recommended in urban areas). Note that hard x-ray frequencies should be used with extreme caution when fighting in areas where collateral damage is of issue as the weapon system is capable of easily delivering instantly fatal doses of radiation even through thick intervening objects such as buildings and vehicles. Though capable of firing sustained beams it usually fires in pulses to maximize damage.

Fire control is handled completely by the ICS with the armor pilot only designating primary targets. Unless ordered explicitly to the contrary the ICS will automatically fire at targets it considers threats (missiles, large rounds, etc). Since the system is an array of millions of microscopic emitter units it can easily divide its fire amongst a large number of targets or concentrate it to only one, as the situation dictates.

- Location: On each of the armors two shoulders
- Primary Purpose: Anti-armor/Anti-personnel
- Secondary Purpose: Active Defense
- Damage (per shoulder array): 1 beam: Moderate; 6 beams: Light; 36 beams: Very Light; 216 beams: supra-light; 1296 beams: extremely light.
- Range:

- Atmosphere: Visible/IR: 163km; X-ray: 12 km
- Vacuum: .05 AU (focal accuracy, tactical accuracy limited by light speed delay)
- Rate of Fire: Each emitter cluster can sustain a beam for 2 seconds with a recycle time of 1 second. System RoF depends on number of units used. If multiple clusters combine their fire it can maintain a constant beam on the target.
- Payload Effectively infinite
- Number of Weapons: 2 (per shoulder)

## **Laser Electrical Arc Gun [LEAC]**

The LEAC was designed as supplement to the VFHAL systems nonlethal capacity, primarily against augmented individuals where the VFHAL system would be likely to cause serious harm while incapacitating (due to the energy outputs it would have to produce to subdue such a individual). It is a two-stage weapon, firing a ionizing laser towards the target and then discharging a large electrical burst into the resulting conductive path, which arcs to, and through, the target. Against fully organic targets the electrical burst overrides the nervous system and disables the target. Low settings are extremely unlikely to cause any life threatening effects, but even moderate settings (relative to its maximum output) on the weapon can kill. Against augmented targets the massive burst causes a localized EMP pulse that can easily disable cybernetic systems. Lowered powered bursts will only temporarily disable, causing no permanent damage, but higher powered shots can deliver enough energy to melt metal. The weapon is almost totally ineffective in vacuum. The ionizing laser can be used for comparatively low-powered tasks such as welding, but does not have the power to punch through modern military armor.

- Location: Left Forearm
- Primary Purpose: Non-lethal Crowd Control
- Secondary Purpose: Anti-nanotech
- Damage: Up to very-light
- Range: 300 meters
- Rate of Fire:
- 10 shots/minute at max charge
- 30 at standard charge (able to totally incapacitate a large adult)
- Payload Effectively Infinite
- Number of Weapons: 1

## **Channeled High Density Fast Neutron Beam Generator [CHANAG]**

An addition in the B2 model to increase its offensive punch, the CHANAG weapon system is purely

military in function (a departure from the suits other systems which were implemented to be functional in crowd-control operations for previous models). The CHANAG emits an extremely high energy, high density beam of neutrons. The beam is generally operates in the 1.5-2 MeV range (which is most lethal to living organisms). Within this energy range the generated beam can deliver radiation doses well in excess of 1.2KSv, capable of delivering an instantly lethal dose with even a grazing strike or through heavy cover. The beam, combined with secondary radiation generated on impact, can easily neutralize all nanomachines within several meters of the impact site. Not that this weapon should not be used in situations where collateral damage or civilian injury are of issue as the beam can easily penetrate thick walls and cause serious damage and terminal injury a large distance from the intended target. It is also capable of generating radioactive isotopes on the target material (particularly the high-density materials used in armor construction).

The weapon operates by pumping free neutrons down a array of picoscale channels that utilize the Casmir force to accelerate the particles. Much like CTA systems, the CHANAG system utilizes a variable channel geometry and variable-permittivity materials to control the energy of the emitted particles.

- Location: Right Forearm
- Primary Purpose: Anti-Armor
- Secondary Purpose: Anti-Personnel, Anti-Nanotech
- Damage: Up to moderate
- Range:
- Atmosphere: 6 km
- Vacuum: 20,000 km
- Rate of Fire: 1 shot/3 seconds.
- Payload Can extract neutrons from an atmosphere, also contains a high density fuel rod that can provide for 300 shots before needing to be replaced. The rod can be replaced in the field through a sealable opening on the rear of the forearm.
- Number of Weapons: 1

## Electroshock Armor

The PAs armor is able to conduct a charge for use in close combat. This charge can range from a middle non-lethal jolt up to a high energy, extremely lethal blast. At higher energy levels the voltage is sufficient to ionize the surrounding atmosphere resulting in arcing and an 'aurora' effect around the armor. This high energy charge is extremely destructive to nanomachines around it and can destroy nearby electrical systems. Lower charge levels will destroy them on contact as opposed to at range.

- Location: Total coverage of armor
- Primary Purpose: Close-combat

- Secondary Purpose: Anti-Nanotech
- Damage: Up to super-light
- Range: Contact; anti-nanotech up to 1m at max charge
- Rate of Fire: N/A
- Payload Infinite

## Monomolecular Retractable Blades

The armor has retractable claws on each tow and finger as well has a longer set of 2 blades in each forearm. The toe and finger blades have a triangular cross-section while the blades have a more standard blade shape. Though not powered like the optional glaive (though they can conduct a electrical shock from the armor) with the immense strength and mass of M279 behind them they can do very serious damage to targets. The forearm blades frequently see use as breaching tools since a good swipe can slice through military alloys and heavy-duty construction materials.

- Location: Hands, Feet, Forearms
- Primary Purpose: Anti-everything
- Secondary Purpose: Demolition
- Damage: Heavy

## Multi-agent Dispenser System

The right forearm contains a spray dispensing system linked to a series of hold tanks within the lower torso of the armor. This system was originally implemented in the A model, where it was intended for use with nonlethals such as tear gas and flame retardant. It was updated in the B1 to have atomic-level sealing so it could handle lethal agents such as chemical weaponry and improved again in the B2 to handle trinary chemicals, most notably RZ-type incendiaries.

The dispenser system fires through a small sealable nozzle on each forearm and can dispense agents either through pressure (for most materials) or through a low powered accelerator (for special compounds such as RZ). The tanks inside the armor can hold up to 5 different compounds in high-pressure, multi-layered, chemically inert self-sealing chambers. The transfer system to the dispenser unit has three separate channels to keep binary and trinary chemicals separate until they are actually being fired. The dispenser itself has a 2-stage mix system and can either mix the chemicals in a pre-fire chamber (for most substances) or mix them during firing (for trinary agents, generally two of the chemicals are mixed prior to firing with the third injected during firing; this is intended for extremely reactive agents such as RZ). A short list of common agents used with the system is provided below:

- Flame-retardant Foam: A binary compound, when mixed during firing the chemicals undergoes a chemical reaction which massively increases its volume. After its expansion phase it is chemically inert and has a very high specific heat, allowing it to smother fires very effectively.

- **Rysa Cryogenic:** A binary agent that reacts extremely endothermically with most atmospheres. It has uses both in fire-fighter where its extreme cold can put out fires and in non-lethal crowd control and raids. Used against living targets the extreme change in temperature causes shock, disabling affected individuals. While generally non-lethal care should be exercised when using Rysa in enclosed areas since the temperature shift can induce a lethal state of shock in many individuals. Do not allow the agent to contact the skin or enter any wounds as the agent can cause massive tissue damage and hemorrhaging from freezing of bodily fluids. After the agent reacts it forms a white-gray biodegradable dust. The largest recorded shift occurred during testing and had a shift from 300\* K to 190\* Kelvin over a period of 19 seconds in a 4m cubic area at standard pressure from 900 grams of agent in a airburst configuration. Field users should expect significantly less efficiency however, with 1 gram able to drop the temperature of 1 cubic meter of air at standard pressure by ~7 \*k.
- **Tear Gas:** Rather generic, designed as non-lethal irritant.
- **RZ-type Incendiary:** A trinary incendiary, RZ comes in several different formulas. It consists of a binary fuel and powerful oxidizer that are mixed during firing to form an extremely sticky liquid. Mixed RZ will autoignite at room temperature. The most energetic mixes burn at 4200\*K and are capable of burning right through military-grade alloys and ceramics and vaporizing lesser materials. While this makes it quite good as a breaching tool, these mixes are not of great use in boarding actions overall because they can easily cause serious damage to a ships internals. Because of this less energetic mixes, burning at ~2600\*K are commonly used. While hot enough to melt iron it is not hot enough to quickly melt most military armors, making it a ideal boarding weapon since the extreme heat can easily prove fatal to crewmembers even at range from the incendiary. Note that since all RZ mixes have there own oxidizer they cannot be smothered and it is quite capable of burning in the vacuum of space. Also note that the high temperature of the incendiary tends to ignite secondary metal fires, which can continue to cause serious damage even after the incendiary itself has burnt out.

The tanks ca each holds 0.4 fluid gallons of agent.

- **Location:** Right forearm
- **Purpose:** Multi-use
- **Damage:** non-lethal (flame retardents, tear gas, etc.) to heavy (RZ)
- **Range:** 120m
- **Rate of Fire:** Continuous jet or bursts, as desired by firer.
- **Payload** 2 gallons agent capacity total.

## Plasma Arc Glaive

\*Note: This item is OPTIONAL

Originally developed for the A279A3 as a close-combat weapon with a range advantage over the armors



integrated weaponry, the glaive has not seen much popularity within the OSF until recently when Fyunnan personnel began using the armor within the LSDF. The glaive consists of a well-balanced solid oval shaft 2.7 meters in length topped by a 1 meter curved blade. The shaft and blade are made of a crystal ceramic threaded with superconducting channels similar to the HECAC armor of the PA. The blade comes to two monomolecular edges separated by a microscopic gap. Each side of the gap is covered in superconductive material. In combat the blade edges are charged to a very high level. When the blade is used to strike a target the sides edges discharge through the target. Depending on the power throughput the arcing can be restricted to contact only or as a continuous arc between the blade edges (note that it can only be used as 'contact only' in a vacuum). The arc generated between the blade edges can easily exceed 15 million degrees allowing the blade to slice through most armor with ease. When used against organic targets the arc tends to cause flash vaporization of body fluids leading to explosive damage to the targets flesh well beyond the contact area of the blade itself. The weapon can be used to deliver disabling blast of electricity, generally through the more bulbous tail of the weapon (though the flat of the blade could be used if desired).

Power for the glaive is supplied by the armor through the grip. An array of super conducting loops can provide power to the blade in absence of the armor-supplied power for 2 minutes of constant arc or 120 strikes. The shaft contains tiny computer that controls the discharge and security of the weapon. When set to 'secure' mode it will discharge into any unauthorized user (determined by either fingerprint or a pulse code received through the wearer's hands. While the weapon is technically useable by a human-sized welder its bulk (~22kg) and large size make it extremely unwieldy even for full bions and totally unmanageable for unaugmented users.

- Location: Carried
- Primary Purpose: Anti-armor
- Secondary Purpose: Anti-personnel
- Damage: Very Heavy
- Payload Infinite on PA power; 2 minutes continuous/120 strikes

## **M43C2 Gauss Battle Rifle [GBR]**

\*Note: This item is OPTIONAL

The standard arms for all OSF (and now many LSDF) powered armors for nearly two decades, the M43 Gauss Battle Rifle has been refined over the years into the current model, the C2. Firing high-energy, high-penetration rounds with a high rate of fire, the GBR is capable of delivering a large amount of destructive power to the battlefield. Like the M12 for light infantry use, the M43 is also capable of firing a wide variety of rounds vastly increasing its utility in nearly any situation. In appearance it is almost identical to the M12, albeit on a larger scale.

The weapon fires the 8mm x 84mm OSF long round which has a triangular cross-section with fluted edges near the tail that act as stabilization fins in flight. The 8mm OSF long round comes in 3 standard variations (though several special-issue ones have been developed):

- Standard: Solid high-density crystal-ceramic intended for dual-purpose use.

- **Flechette:** A thin fiber casing containing 21 3mmx 27mm flechettes stacked in 3 sets of 7. The casing is designed to only keep the round together during firing and to disintegrate immediately after with minimal effect on the trajectory of the flechettes. The flechettes maintain fairly good range and there dispersion is much less than in normal scatter-type weapons and has good penetration. It is intended primarily for use in close confines and in urban areas where the very high penetration of the standard round is undesirable.
- **Explosive (EX):** Fragmentary crystal-ceramic casing and trinary explosive core. Each round has chip that can detonate the round of impact, by proximity (through a tiny RF transceiver), or after a predetermined travel time, as programmed by the weapon just before firing.
- **Shadow Cloud (SC):** A advanced round incorporating a fragmentory shell and a core consiting of a bursting charge and layers of dimonoid monomolecular wire. Like the EX round, each SC round has chip that can detonate the round of impact, by proximity (through a tiny RF transceiver), or after a predetermined travel time, as programmed by the weapon just before firing. After detonation it showers the target and their immediate vicinity with monomolecular wire (or the interior of a target on a subdermal detonation). These wires can turn a person (or other organic target) to a mass of goo in short order or cause serious damage to a more hardened object. DR +1 (+2 on a internal burst) to soft targets. A single round will cover a 1.5 meter radius area.

The rounds can be stored in a 120-round straight clip, 300-round heavy clip, or backpack that can hold 8200 rounds. The weapon is designed to be able to feed from two straight clips and the backpack unit can store up to feed two separate tracks of ammunition to the weapon allowing for selective round fire. The heavy clip does not allow for such fire. With a nominal fire velocity of 3200 m/s and a maximum rate of fire of 1200 rounds/min the M43 is capable of producing immense recoil which can prove of issue even to the incredibly strong M279 during sustained autofire.

- **Location:** Carried
- **Primary Purpose:** Anti-Armor
- **Secondary Purpose:** Anti-Personnel
- **Damage:** Moderate
- **Range:**
- **Atmosphere:** 3.5km
- **Vacuum:** 1200 km
- **Rate of Fire:** 15 rounds/s; 900 rounds/min
- **Recoil:** Heavy, can be extreme during extended autofire.
- **Payload**
- **Standard clip:** 120 rounds
- **Heavy clip:** 300 rounds
- **Backpack:** 8200 rounds

## M65A2 "Ripper" Gauss Autorifle

\*Note: This item is OPTIONAL

One of the most common alternatives to the GBR (generally used when the versatility of the GBR is not necessary), the M65A2 fires lengths of monomolecularly sharp alloy wire at extremely high velocities. The M65 has less per-shot stopping power than the M43 against living targets due to the much smaller projectile diameter (2mm) and very high speed. However, this is compensated for by the extremely high rate of fire of the weapon, which is able to easily saturate a target area. The super-conductor sheathed wire lengths also tend to short out electrical circuitry that they lodge in. The weapon has a rather stubby appearance with an overall length of ~130 cm. The trigger assembly is placed slight forward of its midpoint with a hand grip in front of it along the barrel. It has a scope mount on the top to supplant its integral sensor cluster found just above the muzzle). The ammunition is held in a cylindrical clip under the rear of the weapon or on a backpack attachment. The backpack is connected to the weapon by a thin, armored cable.

The ripper ammunition is in the form of a coil of alloy wire which is fed into buffer chamber (which holds 100 round-lengths in a small tubular chamber for quick feeding) the base of the accelerator where it is cut to the desired length by a laser. The immensely high magnetic field of the accelerator changes the lattice structure of the wire, making it very rigid. The lack of reciprocal parts puts the limit on the maximum fire rate of the weapon on the capacitors supplying the accelerator and the wire spool, both of which are extremely fast. The buffer chamber provides the ammunition to the weapon during autofire while the main spool spins up to speed, preventing the spin-up delay found in older-era Gatling weapons. The weapon has its own internal capacitors that can supply power for several hundred shots but sustained fire requires power from the PA.

Despite the massive rate of fire and huge muzzle velocities the M65 actually possesses comparatively small recoil due to the low mass of the projectile (which are snippets 2mm wide by on average 20 mm, weighing approximately .425g) which makes it lethally accurate in the hands of a A279. The weapon can be used in burst or single shot fire for sniping duties, but the low mass of the round imposes an inferior maximum effective range in atmosphere compared to the GBR, despite its higher velocity. Two different ammo types are available:

- Standard: A high-strength alloy wire. It has excellent penetration but tends to pass through organic and other such soft targets without losing much of its velocity, reducing its damage potential despite the high projectile energy.
- AP: Composed of a more flexible alloy (though still very high strength) wire, AP ammunition is intended for use in cities or where the majority of targets are expected to be unarmored or using soft armor (note that soft here includes bone). Since the wire does not become as rigid due to firing and has a tendency to coil and oscillate after impact, causing serious damage to soft targets. This effect is what makes it ideal for use in cities, since it tends to lodge the rounds within the walls (where their raw energy would otherwise easily propel them through). DR -1 to hardened materials, +1 to soft targets
- Crystal Burst: A advanced ammunition type developed after the exodus, Crystal Burst (or CB) ammunition is formed from a tight weave of crystalline fibers under high tension. When fired the cutting laser bonds and tip and end of the cord to prevent fraying during flight but after impact

with a target the fibers fracture and explode within the target into countless monomolecularly sharp shards. DR +2 to soft targets (or to the interiors of hardened targets if it penetrates)

Nominal muzzle velocity for a standard wire length is 8450 m/s. The weapon weighs ~7kg unloaded and 13.5 kg loaded and can be fired one-handed at lower RoFs, but the recoil of maximum RoFs require the support of both hands. The weapon cannot be used by non-power armors. Its weapons processor can store pre-programmed fire settings and interfaces with the armor's systems through the grip. The integral sensor cluster has can detect through most frequencies though it has notably less resolution than the armor's own sensors since it is designed primarily a gun point-of-view sensor for targeting purposes.

- Location: Carried
- Primary Purpose: Anti-Armor
- Secondary Purpose: Anti-Personnel
- Damage: Light, but due to rate of fire damage can be very heavy
- Range: [/**b**]
- Atmosphere: 600m
- Vacuum: 200 km
- Rate of Fire: 70 rounds/s; 4200 rounds/min
- Recoil: relatively light, can become quite large during heavy autofire.
- Payload
- Standard clip: 10,000 rounds
- Backpack: 140,000 rounds

## **M124A/B Heavy Pulsed Laser Rifle [HPLR]:**

\*Note: This item is OPTIONAL

A common carried weapon during operations in space due to its lack of recoil, the M124 packs a hefty punch for its size but lacks the versatility of the M43 and rate of fire of the M65. The weapon uses layers of quantum-dot emitter arrays (much like the VFHAL emitter units) with waveguides between each layer to channel the laser, producing a powerful beam. The weapon itself is a ~120 cm long with a slim design. The trigger assembly and guard are placed at the midpoint of the weapon with a forward hand guard for long range fire. It has a scope mounting bracket to supplement its small integral sensor cluster should the user desire it. It has no removable clip and receives power from a integral battery array with main power transferred from the power armor (A model) or by a integrated CTA power system (B model). The weapon can operate in a variety of frequencies to produce different results from incapacitation to extremely lethal beams.

It generally fires in a burst mode where several dozen bursts are fired over a period of a few milliseconds. The delay between individual shots in the burst allow pieces of the target (be they steam, pieces of armor, or something else) to exit the target site before the next pulse hits preventing energy absorption from such sources. This also renders ablative armors significantly less effective against the HPLR. Despite its name it *can* be set to fire a continuous beam (lasting up to 12 seconds before the capacitors need to recharge, which takes ~20 seconds after a complete drain), generally for use during breaching operations. Since the beam is steerable to a degree by the weapons processor it can be guided off-axis (~6 degrees in both axis) to hit targets designated to the weapon by the suits fire-control systems even if the armor's aim is not directly on target. Though the weapon has high power output than the VFHAL arrays its focal area is less and it has poorer performance in atmosphere but longer range in space.

- Location: On each of the armors two shoulders
- Purpose: Anti-everything
- Damage:
- Pulsed: Heavy
- Constant (3 seconds on target): Heavy
- Range:
- Atmosphere:
- Visible/IR: 94km
- X-ray: 6 km
- Vacuum: .07 AU (focal accuracy, tactical accuracy limited by light speed delay)
- Rate of Fire: 2 shots/s
- Payload Effectively infinite on internal (B) or suit (A) power, the batteries can supply 70 shots and 36 seconds of continuous beam.

## Defensive Systems

### Armor

#### Outer

The primary armor protection of the A279B2 is in the overlapping 4490 high-density conductor-laced atibium crystal (HECAC) armor, similar to that found on military starships. Under this is a composite of extremely-high density tungsten-sulfide weaves.

## HECAC

This chemically inert material is a complex high-density crystalline matrix. Containing a relatively high concentration of atibium 328 (the most stable isotope), the 4490 grade of HECAC armor is slightly below the midpoint on the scale of protection offered by HECAC-type armors, offering substantial protection for a reasonable weight. The material is extremely hard and the nature of the crystal structure causes it to heavily distort and diffract incident light, reflecting the vast majority of it without having ever absorbed it. Its high density allows it to stop all but the highest energy particle and photonic radiation (most particles at this energy do not meaningfully interact with matter in any event and can therefore not cause damage). The strong dielectric of the majority of the crystal lattice is also laced with superconductive paths (which are actually integral with the lattice, they are not additives and do not affect the armor strength) that protect the armor from high energy discharges. Armor panels on the suit all interlock to increase the protection, with a complex arrangement at the major joints insuring there are no gaps to exploit should melee ensue. HECAC armor is chemically non-reactive and is essentially immune to attack by nano-, micro-, and smaller, machines. Due to the high density and its lattice structure, the molecular structure of HECAC is self repairing in regards to internal damage. This means it does not become brittle under radiation bombardment and does not develop stress fractures. Note that this armor blocks all psychometric transmissions both into and out of the armor, preventing telepathic attack but also blocking the pilots own abilities.

## Tungsten-Sulfide Weave

This is an extremely tight multilayered weave designed to seal the armor. The complex, branching threads of the weave are strongly interconnected. It is chemically inert, electrically nonconductive, and possessing effectively zero dipole moment. This combination makes the weave an extremely effective defense against nanomechanical (and smaller) attacks and renders the armor effectively immune to chemical and biological attacks.

## Inner

The inner armor consists of a relatively thick layer of anti-rad gel, a thermally superconductive cermet layer, a layer for IMRS fluid transfer, and a final layer of a WS2 weave. The inside of the armor is a channeled rubbery material designed to fit around the user. The suit is compatible with the M37 BDU and has connection ports to interface with the recycling system of the suit to expand its endurance. While possible, naked operation is not recommended.

## Anti-rad Gel

This layer consists of naoscopic gel-filled cells which protects the occupant from sudden jolts and absorbs any high-energy radiation that has penetrated the outer armor. It serves as the armors primary static protection against kinetic shock from projectile impacts, melee strikes, and falls. Combined with the outer armor layers it can almost totally defeat such attacks.

### **Thermally Superconductive Cermet**

This layer consists of a proprietary cermet. Its primary purpose is to transfer heat produced in the layers above it from impacts (since both kinetic shocks and energy weapons will heat up the armor as they are blocked) throughout the armor so that it can be reradiated. It also transfers the waste heat from the user and the armor's own internal systems to the armor's surface to be reradiated. This material is not restricted to its primary layer and threads of it continue throughout the inner armor. The WS2 and HECAC layers are also quite thermally conductive and assist with heat transfer.

### **IMRS Transfer Layer**

This layer contains transfer channels and nanoscopic materials storage pockets for the Integrated Micromachine Repair System to allow it to repair the armor. The IMRS system in the armor is notably more capable than that found in the A38 BDU and it is capable of performing a wide range of repairs on the armor and can slowly repair the WS2 weave (possible through special-purpose, much larger micromachines). It can not repair HECAC armor (the panels have to be replaced) due to its very high binding energy but it can fill damaged areas with a TiS<sub>2</sub>/polymer gel for temporary repairs. This compound rapidly hardens to a functional armor, although it is much weaker than the HECAC armor it replaces (DR 5).

### **Tungsten-Sulfide Weave**

Essentially identical to the outer WS2 layer, albeit thinner, this is an extremely tight multilayered weave designed to seal the armor. The complex, branching threads of the weave are strongly interconnected. It is chemically inert, electrically nonconductive, and possessing effectively zero dipole moment. This combination makes the weave an extremely effective defense against nanomechanical (and smaller) attacks and renders the armor effectively immune to chemical and biological attacks.

### **Overall Armor DR: 7**

### **Armor-Energized Magnetic Shield [AEMS]**

A byproduct of the energizing of the HECAC armor, the A279 can produce a very strong, localized magnetic field around itself. When charging the armor for this purpose, it usually is down in the subdermal layers so it does not discharge into the surrounding environment. It provides good protection against charged-particle weapons (most particle beams, positron beams, plasma weapons, etc.), some protection against MAP (magnetically accelerated projectile; railguns and such) weapons that do not discard the conductive portions, and effectively no protection against purely photonic weapons (lasers). While the weapon can deflect the charged beam of incoming particle weapons some weapons, such as positron weaponry, can still cause damage through secondary radiation and blast from interacting with the surrounding environment (air, bulkheads, etc) though this damage will be much, much less than a direct hit. The shifting magnetic field also generates a strong electromagnetic field around the armor that

can severely disrupt and damage electronics like a electromagnetic pulse (which it essentially is, albeit occurring continuously) within several meters.

While the AEMS protects the armor from many modern power armor weapons, it cannot be used in situation where stealth is required since the extremely powerful magnetic field is very obvious. Also note that the field has the same effects on weaponry fired from the M279 when active, wildly deflecting fired plasma weapons and because of this such weapons are rarely seen deployed with a A279 unit. The EMP effect of the field also restricts its use in some environments since the field can damage sensitive equipment. As a positive however, the shield can be maintained indefinitely even under heavy assault since impacting shots do not deplete the charge held within the armor.

Against weapons that it can affect (charged particle beams, plasma weapons, etc.) it increases DR by 1.

### **Gravimetric Null Field Generator [GNF]**

The most notable addition to the B2 model over the B1, the GNF system was rushed to completion for use in the B2. The system utilizes a modified version of the string manipulation system used in latest OCG spacecraft to generate artificial gravity to protect against the prevalent scalar and gravimetric weaponry. Rather than generating gravity the GNF system negates gravity, and other space-time manipulations, within the area of the field. Note that the string manipulation does not affect gravity outside of the field and so does not create any signature on the surrounding space. The field is also not subject to the inverse-square law and the effect is uniform throughout its volume (extending 20cm-10m from the armor). The field prevents any interaction with matter inside of the field with gravimetric and scalar weapons (such weaponry pass through the field space as though it were empty, although time-delayed effects such as field or particle delay are halted within the field effect) and tests have shown it has a disruptive effect on the subspace bubbles used to enhance the tactical range and penetration of many weapons, causing the bubble to collapse on contact with the field. This subspace disruption is not significant enough on the A279 to effect large-scale systems such as starship drives (though it would allow the armor to move through such fields). The string manipulation also has a disruptive effect on quantum effects used by mass-energy sensors and entanglement/probability sensors such as the WARMS system, preventing them from seeing within (or near) the field. In the vast majority of space situations the sensor void is far too small to be anomalistic (due to the extremely low particle density in space, to which such sensors entangle to) This system was an intended addition in the B2 model at its initial production but difficulties in its development prevented its integration into the armor (both existing and new units) until late PR 103 (after the exodus).

### **Force-field Shield Generator**

\*Note: This item is OPTIONAL

A backpack addition (it would have required too much reworking to integrate into the B2) designed to offer additional protection. It is in effect an omni-directional force-field generator, nearly identical to the forcefield system used to retain atmosphere on starships. The current version is rather weak compared to dedicated systems on similar mass armors used by other nations, but this will be improved in the C



and F303. The generator has its own power system and can remain active essentially indefinitely if not under stress (i.e being shot at). Though not originally intended, the forcefield also greatly reduces its drag and provides a massive increase in atmospheric and underwater performance. The shield bubble also massively improves the armors stability at speed in atmosphere.

- Speed (atmosphere):
- 6,983.88 kph (Sea level)
- 31,166.4905 kph (25 km)
- Underwater:
- 118.44 kph (actuator only)
- 227.38 kph (assisted by thruster array)

**DR: 2**

## Combat Shield

\*Note: This item is OPTIONAL

This large, rectangular (~1.2x2.3m) shield has seen frequent use by ORN boarding parties and OSF police raid squads. It consists of a nearly solid 42mm of HECAC 4490 armor. It also incorporates a similar optical camouflage system to the PA and can its local controller can interface with the suit so the two can coordinate. It also incorporates the same structures that make up the AEMS system in the PA and benefits from this. It has no viewport through it and the user must utilize the sensors that make up the camouflage system to view the other side.

=DR: 8

## Systems Descriptions

### Power Systems

The A279B uses 5 separate casimir turbine array arrays (CTA), 3 set apart in the torso and one in either leg, providing the suit with ample power for its initial design. While the CTA system was expanded somewhat in the A279B2 a large increase in power output would have required a total reworking of the power distribution system of the suit, which the design group determined would be too costly and time consuming to be implemented on the A279B2.

### Attached Systems Power

The A279 can use the conductive channels in the armor to provide power to attached systems (extra sensors, weapons, back modules, etc.) without the need for vulnerable power cables. Since the power throughput is purposely limited (above a certain level, determined to be non-damaging to the armor, the channels lose their superconductive properties and become strong dielectrics) attached or carried items that have very high power demands usually incorporate their own power sources to supplement or replace the power received from the armor.

## Integrated Computer System

The ICS of the A279 is a distributed nanomechanical system AI (it was determined that it was not justifiable to include a quantum computing core in the ICS) and optical-based 3-dimensional crystal matrix mass storage. Note that while the ICS is sentient to a degree (primarily for better prediction of target behavior) it has a very narrow focus of interest dealing with combat and tactics (you could chat with it about battle plans or capabilities of weapon systems but it would have no interest in discussing politics and would have great difficulty doing so). The primary purpose of the ICS is to control the VFHAL system since navigation, sensor processing, and other tasks generally require only a small fraction of its total power compared to target tracking and interception for the VFHAL. Its database can hold a very large amount of information, most of it being used to store data about known target types so that the user and ICS can determine where to hit and a target and with what. An update from the B1, the B2 has a very detailed starmap for autonomous plotting and navigation when in space.

Since the multiple target capability of the VFHAL system is well beyond the capability of an organic Turing mind the ICS generally handles all direct firing of that system with the pilot only designating targets. The ICS then arranges a fire queue based on the threat from the target, though the pilot may override the ICS's chosen fire order if needed. It is capable of tracking approximately twelve thousand targets at any one time and maintaining current-time firing solutions on up to three thousand targets at any given moment.

## Sensor System

The A279 has a number of sensor systems accessible through a firmware system or coordinated by the ICS. In most situations the pilot only makes use of a tiny fraction of the sensor data (due to the limits of a Turing mind), with much of the remainder being processed by the ICS.

## RADAR

Though termed RADAR, the analogous system in the A279 is capable of operating in many different frequencies. The RADAR beams are generated and steered through unused (i.e. not immediately firing) VFHAL units and detected by the thermoptic camouflage system. Since it is a phased-array system it can use dozens or hundreds of unique beams to scan its surroundings, greatly increasing its accuracy.

- Range: Theoretically infinite, but limited tactically by light-speed delay.

## **XADAR**

Very similar to the RADAR system but operating in the X-ray spectrum XADAR can be used to scan through intervening objects such as walls and doors. Its use is generally not advised in collateral-relevant environments since the x-rays can cause harm to living things in its area from extended exposure.

- Range: Theoretically infinite, but limited tactically by light-speed delay.

## **Milimeter-wave RADAR**

Similar in operation RARA systems but it operates in the millimeter-frequency range. It is able to penetrate most materials (including many armor metals and ceramics) and can generate high detail, accurate three-dimensional pictures of their internals as well as determine material composition. It is not harmful to organics or electrical systems (except at very high power outputs).

- Range: Theoretically infinite, but limited tactically by light-speed delay.

## **Optical**

The A279 can utilize the thermoptic camouflage sensors to effectively see from all surfaces of the armor. The 4 'eyes' on the head can also be used. The large surface area of the optical sensors combined with sophisticated digital lensing of the incoming data allow the pilot or ICS to focus on multiple targets irrelevant of range with a incredibly high effective magnification. This also allows for the correction of atmospheric and material interference, resulting in extremely detailed 3-dimensional (if desired) pictures.

- Range: Theoretically infinite, but limited tactically by light-speed delay.

## **Subspace:**

The B2 model incorporates a fairly primitive subspace sensor for FTL detection of targets using subspace systems. This system will be improved and supplemented by a tachyon radar on the C (this radar proved too bulky for inclusion on the stop-gap B2).

- Range: 1.4 Ly

## **Sonic**

The A279 has very sensitive sound sensors and also includes pulse generators (located in the head and shoulders) that can be used as imaging sonar. At higher and lower frequencies the sound beams are penetrating and can be used to examine behind obstructions such as walls without the collateral side-effects of the XADAR. With the ICS the sonic sensors can be used to track noise-making objects around it (even very quiet ones), such as other armors and bullets) including tracking their path of travel completely passively. Combined with atmospheric data from the radar the ICS can even plot the travel of

sound waves through a turbulent environment, allowing the suit to “hear” accurately even in incredibly windy environments. It is only usable in atmosphere. The below ranges are for its operation as a imaging Sonar, directional hearing is much longer in most situations.

- Range:
- 2 KM (atmoshpere)
- 20 Km (water)

## **Communication**

The communication systems of the A279 have not undergone a significant revision from the B1 to the B2. The ICS system can code and decode nearly all LSDF/OSF encryption methods, given a key. The ICS is also capable of breaking most civilian and lesser military encryption methods given time, but in general such messages will be recorded and forwarded to its base for analysis by much more powerful AI cores. On direct-line transmissions (laser or neutrino) the ICS can utilize effectively unbreakable quantum encryption methods but these methods cannot be used on wide-angle transmissions. For such transmissions it utilizes a classified high-order block encryption with multi-phased frequency-modulated transmission.

### **Laser**

Simple as it sounds, a direct-line communication system. It is only interceptable if the interceptor is in the direct line between the target and intended receiver.

- Range: 0.2 AU (focal range, tactical range limited by light-speed delay)

### **Radio/Microwave**

Very similar to current-generation systems, it is the wide-angle transmission (though the ICS can focus the transmission if desired to narrow beams).

- Range: Effectively unlimited, though tactically limited by light-speed lag.

### **Neutrino**

Utilizing neutrinos to transmit information allows the armor to send messages through solid objects (such as planets). It can be used in either a wide-angle transmission or direct-line. Neutrino transmissions are also extremely hard to intercept, even without encryption and totally undetectable without a specialized sensor. This has the side-effect of limiting the effective range of system since longer range transmissions require a more sensitive transceiver.

- Range:
- Receiver: .2 AU
- Transmit: no theoretical limit (focal range, tactical range limited by light-speed delay)

## Life Support

The A279 uses a similar, albeit more heavy duty, to the M37 suit. The system can break down waste to a molecular level, extracting material that could be of use to the pilot and storing (or ejecting) the waste material. Oxygen is stored in solid-state buffers. With the ability to break down CO<sub>2</sub> and CO the system can provide an effectively infinite supply of oxygen. The armor recycling system can, starting with standard nutrient and water stores, keep the pilot adequately supplied for up to 5 weeks. The smaller myomer bundles can be used to keep the users circulation up and keep the user from dozing off during extended missions.

## Multi-spectrum Optical Camouflage

The armor has a advanced multi-spectrum optical camouflage underneath the HECAC armor. It is able to detect from ULF radio to X-ray transmissions, though the system generally only transmits up to ultraviolet frequencies (it can transmit in X-ray frequencies if desired, though this does carry all the collateral effects of x-ray radiation). While its retransmission power is rather large, it cannot replicate high-energy transmissions (such as energy weapon discharges), though it can transmit at high enough power to form a extremely bright spotlight. The sensors of this system are also utilized as the primary optical sense of the armor. It can generate patterns and images on the surface (camouflage, logos, etc.) as desired. Due to the distortive nature of the HECAC armor the processing for the camo is much more complex and intensive than on the simpler systems used in other armors. Because of this the camouflage is controlled by a dedicated node with assistance provided by the ISC in complex environments where the processing is even more intensive. Because the sensor/emitter units are omnidirectional (in the plane of the armor) and since most of the function of the camouflage is processor-based it can continue to operate properly even when the armor is damaged. Also, since the HECAC armor is chemically inert and smooth down to the molecular level (when undamaged) the armor surface rarely becomes dirty (since debris, be it dust, paint, or other material, cannot bond with the armor material and the surface has no points where friction is sufficient to hold it on so it will easily fall off). The system can detect and retransmit the psychometric (telepathic) signals but the default ISC does not have the programming to generate its own signals. This programming does exist but is strictly restricted to special-forces armors, is never sold to any outsiders, and is classified as a state secret by the OCG.

## Electronic Counter(-Counter) Measures [ECM/ECCM]

The B2 model was updated with a significantly enhanced ECM/ECCM system over the B1. Controlled by the ICS, the ECM/ECCM is capable of intercepting signals, processing, and implementing electronic counter measure totally autonomously from the pilot (unless such action was directly countermanded by the pilot). In coordination with the sensor and communication systems the armor is able to perform wide-band jamming in the electromagnetic frequencies. Though the system can, in most cases, overwhelm the

communication and sensor systems of power armors it does not have the output to blind ship systems (though against escort types it might be able jam a single ship with directed beams).

The main dispenser system of the armor is placed in two nodes on the top outer edge of the upper drive fins. The nodes contain multi-spectrum smoke, chaff, and sensor drones. The smoke and chaff are intended to defeat missile weapons that (for whatever unlikely reason) were not shot down by the VFHAL system and can be used against all EM-based systems to conceal the armor. Note that both of these systems are of limited use when the armor is maneuvering at high accelerations since they can only maintain the velocity of the armor at time of release. The sensor drones can be set to mimic the signature (in EM spectrums and gravimetrically) of many different targets and it can switch through several different ones through its flight. It is powered by a super conducting capacitor array and a reactionless drive unit (contained in 3 retractable fins) and is able to achieve very high accelerations (up to 3000G). Its capacitor can power the drive and sensor generator for up to 3 minutes. Based upon the target profile it is mimicking the drone will match its movements and actions to match the subject. While of less use at close range, the drone can easily fool most sensor systems at range. Each node has 2 drones, enough smoke for 15 discharges, and enough chaff for 12 discharges.

## Direct Neural Control System

The A279 utilizes a [type\\_2](#) neural interface (which has an output jack at the base of the skull) to connect the armor and pilot. The control system with the neural interface is highly intuitive since the armor intercepts the directives from the brain to the pilot's limbs and mimics them, making it an extension of the brain for all intents and purposes. Since the system is interfacing directly with the brain it is capable of response times faster by far than a normal body. Though the helmet has a HUD that can display any information the user desires (along with the outside surroundings), this information is usually delivered through the interface directly to the brain.

Though the system can be used perfectly fine by a totally inexperienced user (the ISC is quite capable of instructing a new pilot) it takes a large amount training and usage to utilize to its full potential. New pilots frequently report headaches and similar due to the very high amount of sensory input, since they are receiving it from both their own senses and the armors. Because of this it is not at all uncommon for veteran pilots (most of whom are partial if not complete bions) to turn off their own senses and rely totally on the armors sensors. Since the armor ISC is a AI it can learn the habits and tendencies of the pilot during combat and can compensate for ineffective or negative ones and enhance positive ones. Because of this it is common for pilots to use the same armor for extended periods of times. Since the ISC system is a true neural-network associative system each ISC becomes unique after activation and so cannot be copied between armors (at least in a reasonable time frame).

The armor also possesses manual controls and a firmware operating system that can be used in the eventuality that the ISC fails. In this eventuality fire control for the VFHAL system and fine target control of other weaponry is controlled by the eye movements of the pilot. These controls are operated by the user's limbs and fingers and require a high degree of training to use quickly.

## Integrated Micromachine Repair System [IMRS]

The IRMS system is similar to the A37 system and can interface with that system. It utilizes the much more resilient and capable micro-sized units versus the nanomachines employed in most systems. It is capable of repairing internal damage but cannot repair the HECAC armor and WS2 weave, but it can seal breeches in the armor. The armor has several resource reservoirs throughout it that it can draw on for repairs.

## TG309 Flight Pack

The second iteration for the A279 designed to greatly enhance its flight capabilities, it did not see much deployment due to its costs until the last few months. It fits on the back of the armor and supplements the armor's flight system with 4 additional drive fins. It also incorporates a powerful inertial compensator whose field 'links' the mass within the field, keeping everything accelerating uniformly (it does not actually reduce the unit's inertia). The unit greatly increases armor's tactical speed and maneuverability. Note that the following speeds are maximums. It is not advisable to travel at speeds beyond

- STL: 12,000G (0- 0.1C in 255 seconds at flank acceleration)
- Atmospheric:
- 30,037.71 kph (Sea level)
- 134,047.231 kph (25 Km)
- Underwater: 1,041.06 kph

## Legal Considerations

The A279 is considered strictly military hardware and is not sold to outsiders except with a highly-controlled mercenary license. The psychometric processing programming is a state-secret of the OCG and an ongoing authorization for extreme sanctions against any civilian known or believed to possess it is in effect (meaning that essentially anything goes on the part of the government agents to apprehend the subject and the programming).

## OOO Notes

Authored and approved by [Wes](#) on November 1, 2007 <sup>1)</sup>

<sup>1)</sup>

<https://stararmy.com/roleplay-forum/index.php?threads/orn-a279b2-power-armor.555/>

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