Origin Armor Works M1 series Powered Frame Internal Systems

Starting in YE 31, Origin Armor Works, the mecha and powered armor design and production branch of Origin Industries, Origin Armor Works, began designing their initial series of Humanoid mecha, the M1 series of powered frames. In order to cut costs and reduce development time, OAW used the same set of internal systems for every product in the line, with only few changes from model to model.

Hull and Hull Integrated Systems

Hull and Chassis

ADNR reinforced Durandium Alloy Outer Armor The M1 Series has an outer armor is composed of ADNR impregnated Durandium, layered in plates over the frame's skeleton. The armor is neither heavy nor light, but offers superb protection. The outer armor is electrically charged, generating a tight, form fitting electromagnetic field, separate from the shielding system. This electromagnetic field isn't powerful enough to completely deflect incoming attacks, but it does weaken kinetic impacts and damage from Particle, Plasma and Laser weapons, up until the point where the charge wears off. The armor also has a layer of heat-dissipating paint, which ablates off when exposed to high-temperatures, leaving the armor under it unharmed. **Armor Type:** Medium **Structural Points:** SP 5(SP 10 for the Kirin)

Boreanium Alloy and Endurium plating(Note: Kirin and Asura only) The later models of the M1 have added defensive plates of Endurium and Boreanium, two new alloys designed by Origin Industries, plated over the cockpit, lower body, shoulders, and knees; the Boreanium is layered on top of the Endurium. These plates help to increase the Frame's durability, giving it military grade defense. Due to the special properties of Boreanium, Frames armored with it leave behind, when expelling hit from its surface, misty 'afterimages' composed of ablated boreanium. **Armor Type:** Heavy **Structural Points:** SP 5

Nerimium Internal Skeleton The M1's internal skeleton is constructed from Nerimium for a sturdy build. The skeleton's joints are flexible enough to mimic human movement, a magnetic coating applied to the joints to decrease friction; a few changes have been made to it's structure in order to compensate for size. Armor, electronics, and other systems are mounted directly to the skeleton, with plasma conduits running along it. The cockpit, IAPD, nuclear fusion reactor(missing on the Oban) , and main computer are located inside a protective 'ribcage'. The Frame moves it's limbs with numerous nano-muscle clusters, each one enhanced by hydraulics and electric motors. The Asura's skeleton is flexible enough to allow it to be much more maneuverable in combat than its size would indicate. **Armor Type:** Light **Structural Points:** SP 10

Sub Arms (Note: Kirin and Asura only) Located in the shoulders(2 for the Asura, 4 for the Kirin) and skirt armor (2 for both) of the frame, the later models of the M1 have four secondary arms(Six, for the Kirin) . The sub arms are lightweight and unarmored, and are little more than manipulators and actuators with stabilization gear to keep the arm steady when firing, meant to allow the M1 to use its entire

handheld armament at once. The Sub Arms have a full range of motion, and are sturdy enough to be used in melee combat.

Life Support

The M1 series has a standard life support system, with a pressurized cockpit, oxygen scrubbers, and a temperature-humidity regulation system. The M1 also has an inertia control system to keep the g-forces on its crew to a minimum.

Binders

(Note: Ashigaru and Asura only) The M1 Series normally has three Fuel Binders, with the large one on its lower back, and the smaller ones connected to the upper back. The Fuel Binders have a dual usage, both acting as extra limbs to assist in AMBAC movement, and as fuel-storage. In the role of extra-limbs to assist in AMBAC, the Fuel Binders are connected to the Frame by highly flexible joints, which allow the Binders a 90 degree range of movement. In the fuel storage role, the Binders each contain an hour's worth of Deuterium-Tritium liquid fuel, with fuel lines leading to the Fusion Reactor. The reason the Binders also serve as fuel-tanks is to increase their mass, which assists in AMBAC movement. The Fuel-Binders are detachable from the Frame, and can be replaced with specialized equipment packs

Vernier Thrusters (Asura only) Located on the backs of the Asura's shoulders, the two verniers are an extension of the AMBAC system. While shorter and lighter than the Binders, the Verniers incorporate propulsion thrusters into a movable extension, increasing the Asura's AMBAC and powered maneuverability. The base of each vernier has 90 degrees of mobility in four directions, allowing the Frame to rapidly change direction in zero-atmosphere.

Wing Binders

(Kirin Only) The two wing binders on the Kirin's back serve two roles. In addition to assisting in AMBAC movement, each wing binder is capable of carrying the hand held armament of the Kirin. Each binder can carry a single rifle sized weapon and a melee weapon, as well as extra ammunition for hand held weaponry. The binders are also capable of recharging energy and plasma based weaponry compatible with the Kirin.

Tail Binder

(Kirin Only) The single tail binder, mounted to the Kirin's lower back serves as an extra place for weapons in addition to AMBAC assistance. The lower fourth of the binder contains the Mini-missile pod, the remaining two fourths of it serves as a docking/refueling port for the Kirin Feather support drones, and the remainder of the Binder is used as fuel storage for the nuclear fusion reactor.

Shields

The M1 series has two types of shields, electromagnetic and gravitic, layered with each other. Each shield is generated from two tandem generator pairs within the frame. The two shield systems work in concert, allowing the frame to survive large amounts of damage.

Electromagnetic & Gravitic Shielding

The Electromagnetic shield generator is located in the Frame's lower torso. The shield generator creates a powerful field, which hugs close to the frame like a tight bubble. The Gravitic shield generators are located in the Frame's shoulders, creating a spherical gravitic shield around the entire frame.

Locations: Lower Torso and Shoulders **Shield Points:** SP 20(2,Kirin+Asura),SP 10(2,Oban),SP 14 (2,Ashigaru) **Runtime** Operative as long as power is available

"Kirin's Mane" Plasma Shielding

(Kirin Only) The Kirin can vent high-temperature plasma as a defensive measure, using the plasma produced in its nuclear fusion reactor as a defensive coating. The Plasma Shield slows down and melts away at incoming kinetic munitions, causes plasma weaponry to dissipate, and makes lasers lose their coherence. The plasma is vented from vents on the Kirin's shoulders. **Locations:** Nuclear Fusion Reactor **Shield Points:** SP 5 (1) **Runtime** Operative as long as fuel is available

Power

Main Power and Propulsion

While the M1 series initially used a nuclear reactor only, all later models instead switched to using instead of using a nuclear fusion reactor for the main source of power and propulsion, uses an Origin Industries Inline Aether to Plasma Drive, which serves as both a main power source, and as the main propulsion for the frame. The IAPD allows the M1 Series to fly, or in the case of the Oban, perform long jumps

Omni-Directional Vectored Thrusting

Ports are located on every surface of the frame. Connected to the IAPD, they allow the frame to travel up to .20c in any direction without changing the frame's heading; they are capable of halting the frame's forward movement and propelling it backwards within 1/100th of a second. These same thruster ports are capable of changing the frame's direction in the same time span, as well as spinning, rolling, and otherwise controlling the frame. Generally, however, the thrusters do not use the amount of power required for such maneuvers.

Afterburner

The M1's IAPD has been modified to allow for brief periods of increased operation, using a system known as the afterburner. The Afterburner operates by increasing the input to the IAPD for a short amount of time, effectively doubling the Frame's speed. The downside to this system is that the Frame will show up on all aetheric sensors within 1 AU, effectively eliminating any stealth it might have had. The M1's afterburner only lasts for five minutes(10 for the Kirin, 2 for the Oban before internal safeties activate and force it to return to normal operation.

Secondary Power

The M1 still uses a Nuclear fusion reactor, albeit relegated to a secondary role, as a secondary power source, as well as to generate plasma for secondary propulsion, weaponry, and defenses. The reactor requires Deuterium-Tritium liquid fuel in order to operate. The M1 series carries enough fuel for nine hours of operation

Plasma Conduit System

In order to transfer the plasma from the nuclear reactor and IAPD to weapons and auxiliary thrusters, the M1 uses a series of Plasma Conduits which transfer plasma to the smaller auxiliary thrusters which line the back of the frame's legs, and to supplemental maneuvering thrusters in the shoulders. Plasma conduits also lead to plugs in the frame's hands, which connect to handheld weapons to supply them with plasma. The PCS can also be used as a last ditch weapon (The plasma only goes out to half a meter, but does Tier 5 or Tier 6, Medium Anti-Armor or Heavy Anti-Armor (

: Staff needs to determine which) damage to anything it connects with).

Emergency Power Sources

As a backup, the Asura has five stirling radioisotope generators (SRG), which in normal use supply backup power to the frame's electronics. During an emergency, the SRGs can be used to power the entirety of the frame, though there is not enough power for combat operations.

Secondary STL Propulsion

The M1 uses a Nuclear-Thermal Plasma Rocket system, which uses the Plasma generated from its nuclear fusion reactor to generate thrust, and a gravimetric drive. The main thruster unit using the Nuclear Thermal Plasma rocket system are the secondary maneuvering thrusters, located on the shoulders. The thrusters use electromagnetism to push the plasma out at high speeds. The rear of the Frame's legs are covered with additional thrusters, which are connected to the main reactor through a series of plasma conduits. These secondary thrusters provide additional thrust, and assist in jumping, high-speed

movement, in-flight maneuvering, and enhance the M1's mobility in space. The Gravimetric drive system both generates limited anti-gravity to keep the Frame mobile in terrestrial environments, allowing it to hover and use the plasma thrusters to propel itself forward as a sort of secondary movement system; and as a secondary propulsion method, causing the frame to make 'controlled falls' in order to accelerate. As a propulsion method, the gravimetric drive is used to slow down and change the Frame's direction, which when combined with the AMBAC and the IAPD, gives the frame a greater maneuverability then it would have without it.

Secondary Movement System

(Asura only) The mass produced Asura incorporates a Secondary Movement System into the frame's lower legs. The Secondary Movement system is a powerful thermonuclear hover jet, allowing the Asura to move along the ground at one hundred and eighty kilometers an hour, without engaging its IAPD or Plasma Thrusters.

Electronics

The M1 Series uses the Pawn to assist the crew, easing their workload and making them that much more effective in combat.

Computing

The heart of the Pawn suite is an extremely advanced quantum computer, capable of performing nearly endless amounts of data-churning and possessing untold memory. Quantum computers, unlike old computers which could only process 1 and 0, can process an effectively infinite range of digits. Unlike its larger brethren, the Pawn suite does not have a very large memory for data storage, and must be more or less purged once a year to remain effective. The Asura's computer is located in an armored box, just below the cockpit

Sensors

The pawn suite has sensors which, in passive mode, can detect things up to 1,000 miles away, and in active mode can detect and provide information (Heading, velocity, size, ship type, energy signatures)on objects up to 550 miles away. All of the M1's sensors are located inside the frame's head, while the main visual sensor varies from model to model; secondary optics are on both sides of the head, in the chest and back shoulders. The M1 has a variety of sensors including:

- Electromagnetic sensors
- Electrogravitic sensors (scalar)
- Radar(From the ECM Suite) Not included on the Oban
- Unified field mass/energy sensors (Field of force sensors (I.e., Gravity, Radioactivity, and Energy))
- Neutrino sensors (nuclear reaction sensors)

- Aether detectors Not included on the Oban
- Visual sensors
- Mass Detectors

Targeting control

The Pawn Suite has a targeting control system that can give detailed information (Heading, velocity, size, ship type, energy signatures) on ten targets, as well as position and orientation (IFF) on up to 25 more targets. Not included on the Oban

Communications

Laser

For close-range transmissions, it is more difficult for the enemy to intercept, because they have to be in the area of the beam. Also limited to light-speed.

Radio

Full spectrum, Dual-Modulation, range theoretically unlimited except by interference. Practical range is short, since the waves only travel at light-speed.

Control Systems

The M1 Series uses the Silhouette neural control system, which is combined with the mind-machine interface from the original Ashigaru to give the frame a highly responsive control system.

Active Mass Balance Auto Control (AMBAC)

Active Mass Balance Auto-Control (AMBAC) is a program in the M1's Pawn AI suite that allows for thrusterless maneuvering in the zero-G environment of space by means of precise control of limbs. AMBAC works by leveraging the Third Law of Motion (when there's an action there is an equal and opposite reaction) to effect changes in direction. AMBAC is by its nature limited to re-orienting the Frame about its center of mass, and is not a substitute for propulsion.

Automatic Stability Management

Another design feature on the M1, the ASM is four gyroscopes, one in each shoulder, and one in each of the Frame's thighs. The gyroscopes serve to keep the Frame steady during aiming and maneuvering. A

unique feature, the ASM helps to improve the frame's stability while it's on the move.

Electronic Warfare

The Asura uses an CECS for handling electronic warfare, such as ECM, ECCM, and SIGNIT operations. Kirin and Asura only.