

Mecha

The term **mecha** (Japanese: メカ Hepburn: *meka*) may refer to both scientific ideas and science fiction genres that center on giant robots or machines (**mechs**) controlled by people. Mechas are typically depicted as humanoid mobile robots. The term was first used in Japanese (*meka*) after shortening the English loanword *mekanikaru* ('mechanical'), but the meaning in Japanese is more inclusive, and "robot" (*robotto*) or "giant robot" is the narrower term.

These machines vary greatly in size and shape, but are distinguished from vehicles by their humanoid or biomorphic appearance and size—bigger than a human. Different subgenres exist, with varying connotations of realism. The concept of Super Robot and Real Robot are two such examples found in Japanese anime. The term may also refer to real world piloted humanoid or non-humanoid robotic platforms, either currently in existence or still on the drawing board (i.e. at the planning or design stage). Alternatively, in the original Japanese context of the word, "mecha" may refer to mobile machinery/vehicles (including aircraft) in general, manned or otherwise.



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Characteristics

The word "mecha" (メカ *meka*) is an abbreviation, first used in Japanese, of the word "mechanical". In Japanese, mecha encompasses all mechanical objects, including cars, guns, computers, and other devices, and the term "robot" (ロボット *robotto*) or "giant robot" is used to distinguish limbed vehicles from other mechanical devices. Outside of this usage, it has become associated with large humanoid machines with limbs or other biological characteristics. Mechs differ from robots in that they are piloted from a cockpit, typically located in the chest or head of the mech.^[1]

While the distinction is often hazy, mecha typically does not refer to form-fitting powered armor such as Iron Man's suit. They are usually much larger than the wearer, like Iron Man's enemy the Iron Monger, or the mobile suits depicted in the Gundam series.

In most cases, mecha are depicted as fighting machines, whose appeal comes from the combination of potent weaponry with a more stylish combat technique than a mere vehicle. Often, they are the primary means of combat, with conflicts sometimes being decided through gladiatorial matches. Other works represent mecha as one component of an integrated military force, supported by and fighting alongside tanks, fighter aircraft, and infantry, functioning as a mechanical cavalry. The applications often highlight the theoretical usefulness of such a device, combining a tank's resilience and firepower with infantry's ability to cross unstable terrain and a high degree of customization. In some continuities, special scenarios are constructed to make mecha more viable than current-day status. For example, in *Gundam* the fictional Minovsky particle inhibits the use of radar, making long-range ballistic strikes impractical, thus favouring relatively close range warfare of Mobile Suits.

However, some stories, such as the manga/anime series *Patlabor* and the American wargame *BattleTech* universe, also encompass mecha used for civilian purposes such as heavy construction work, police functions or firefighting. Mecha also see roles as transporters, recreation, advanced hazmat suits and other R and D applications.

Mecha have been used in fantasy settings, for example in the anime series *Aura Battler Dunbine*, *The Vision of Escaflowne*, *Panzer World Galient* and *Maze*. In those cases, the mecha designs are usually based on some alternative or "lost" science-fiction technology from ancient times. In case of anime series *Zoids*, the machines resemble dinosaurs and animals, and have been shown to evolve from native metallic organisms.

A chicken walker is a fictional type of bipedal robot or mecha, distinguished by its rear-facing knee joint. This type of articulation resembles a bird's legs, hence the name.^[2] However, birds actually have forward-facing knees; they are digitigrade, and what most call the "knee" is actually the ankle.^[3]

Early history

The 1868 Edward S. Ellis novel *The Steam Man of the Prairies* featured a steam-powered, back piloted, mechanical man. The 1880 Jules Verne novel *La Maison à vapeur (The Steam House)* featured a steam-powered, piloted, mechanical elephant. One of the first appearances of such machines in modern literature was the *tripods* of H. G. Wells' famous *The War of the Worlds* (1897). The novel does not contain a fully detailed description of the tripods' (or "fighting-machine", as they are known in the novel) mode of locomotion, however it is hinted at: "Can you imagine a milking stool tilted and bowled violently along the ground? That was the impression those instant flashes gave. But instead of a milking stool imagine it a great body of machinery on a tripod stand."

Ōgon Bat, a kamishibai that debuted in 1931 (later adapted into an anime in 1967), featured the first piloted humanoid giant robot, Dai Ningen Tanku (大人間タンク),^[4] but as an enemy rather than a protagonist. The first humanoid giant robot piloted by the protagonist appeared in the manga *Atomic Power Android* (原子力人造人間 *Gensiryoku Zinzōningen*) in 1948.^[5] The manga and anime *Tetsujin 28-Go*, introduced in 1956, featured a robot, Tetsujin, that was controlled externally by an operator via remote control. The manga and anime *Astro Boy*, introduced in 1952, with its humanoid robot protagonist, was a key influence on the development of the giant robot genre in Japan. The first anime featuring a giant mecha being piloted by the protagonist from within a cockpit was the Super Robot show *Mazinger Z*, written by Go Nagai and introduced in 1972.^[6]

Early uses of mech-like machines in the United States include Kimball Kinnison's battle suit in E. E. "Doc" Smith's *Lensman* novel *Galactic Patrol* (1950), the Mobile Infantry battle suits in Robert Heinlein's *Starship Troopers* (1958), and the film *The King and the Mockingbird* (first released in 1952). And in the Brazilian comic called "Audaz, the demolisher", by Álvaro "Aruom" Moura and Manoel Messias, published in 1939. Also, as an enemy rather than a protagonist, "Federal Men" by Jerry Siegel and Joe Shuster in *New Comics* #8-10 published in 1936 featured "The Invisible Empire".

Genres

In manga and anime

In Japan, "robot anime" (known as "mecha anime" outside Japan) is one of the oldest genres in anime.^[7] Robot anime is often tied in with toy manufacturers. Large franchises such as Zoids and Gundam have hundreds of different model kits.

The size of mecha can vary according to the story and concepts involved. Some of them may not be considerably taller than a tank (*Armored Trooper Votoms*, *Megazone 23*, *Code Geass*), some may be a few stories tall (*Gundam*, *Escaflowne*, *Bismark*, *Gurren Lagann*), others can be as tall as a skyscraper (*Space Runaway Ideon*, *Genesis of Aquarion*, *Neon Genesis Evangelion*), some are big enough to contain an entire city (*Macross*), some the size of a planet (*Diebuster*), galaxies (*Getter Robo*, *Tengen Toppa Gurren Lagann*), or even as large as universes (*Tengen Toppa Gurren Lagann: Lagann-hen*, *Demonbane*).

The first giant robot seen was Mitsuteru Yokoyama's 1956 manga *Tetsujin 28-go*. However, it wasn't until the advent of Go Nagai's *Mazinger Z* that the genre was established. *Mazinger Z* innovated by adding the inclusion of futuristic weapons, and the concept of being able to pilot from a cockpit^[6] (rather than via remote control, in the case of *Tetsujin*). According to Go Nagai:

I wanted to create something different, and I thought it would be interesting to have a robot that you could drive, like a car.^[6]

Mazinger Z featured giant robots which were "piloted by means of a small flying car and command center that docked inside the head."^[6] It was also a pioneer in die-cast metal toys such as the Chogokin series in Japan and the Shogun Warriors in the U.S., that were (and still are) very popular with children and collectors.

Robot/mecha anime and manga differ vastly in storytelling and animation quality from title to title, and content ranges all the way from children's shows to ones intended for an older teen or adult audience.

Some robot mecha are capable of transformation (*Macross* and *Zeta Gundam*) or combining to form even bigger ones (*Beast King GoLion* and *Tengen Toppa Gurren Lagann*). Go Nagai is also often credited with inventing this in 1974 with the television series *Getter Robo*.

Not all mecha need be completely mechanical. Some have biological components with which to interface with their pilots, and some are partially biological themselves, such as in *Neon Genesis Evangelion*, *Eureka Seven*, and *Zoids*.

Mecha based on anime have seen extreme cultural reception across the world. The personification of this popularity can be seen as 1:1 size *Mazinger Z*, *Tetsujin*, and *Gundam* statues built across the world.

In film

- The *Star Wars* multimedia franchise features several walker types, such as the World-famous AT-AT and AT-ST.
- The film *Robot Jox* is based around gladiatorial combat between giant mecha.
- In the 1986 film *Aliens*, Ripley uses a Caterpillar P-5000 Work Loader to fight the alien Queen.
- *Sentinel 2099*, a 1995 film, features a 40 foot tall walking tank called a Sentinel unit. They are used to combat an alien race known as the Zisk.
- In *The Matrix Revolutions*, Captain Mifune leads the human defense of Zion, piloting open-cockpit mecha called APUs, against invading Sentinels.

- In James Cameron's 2009 film *Avatar*, mecha called amplified mobility platform. The AMPs are used as instruments of war.
- In Shane Acker's 2009 animated film *9*, giant walking war machines called Steel Behemoths were created by the Fabrication Machine to destroy all life on Earth.
- A heavily weaponized powered exoskeleton that envelops the operator is featured in the 2009 film *District 9*, and aptly named the *Exo-suit*.
- Guillermo del Toro's 2013 film *Pacific Rim* focuses on a war between humans who pilot massive mechas known as *Jaegers* and Kaiju monsters that emerge from the Pacific Ocean.
- In *The Amazing Spider-Man 2*, the Rhino uses a one-person mechsuit that possesses super strength and defense.
- In the film *Iron Man*, the Iron Monger, a powered exoskeleton suit operated by Obadiah Stane, is another example of mecha.
- In the final scenes of *The Lego Movie*, the main protagonist Emmet creates a giant construction mech made of yellow Lego pieces which he pilots to fight in the final battle against Lord Business' forces.
- In *Avengers: Age of Ultron* Iron Man uses a mecha named the Hulkbuster to fight the Hulk.
- In the 2001 film *AI: Artificial Intelligence* by Steven Spielberg, the term mecha refers to an advanced humanoid robot species featured in the film.



Imperial AT-AT walkers during the Battle of Hoth in *The Empire Strikes Back*, the second film of the original *Star Wars* trilogy.

In video games

Mecha are often featured in computer and console video games. Because of their size and fictional power, mecha are quite popular subjects for games, both tabletop and electronic. They have been featured in video games since the 1980s, particularly in vehicular combat and shooter games, including Sesame Japan's side-scrolling shooter game *Vastar* in 1983,^[8] various *Gundam* games such as *Mobile Suit Gundam: Last Shooting* in 1984 and *Z-Gundam: Hot Scramble* in 1986,^[9] the run and gun shooters *Hover Attack* in 1984 and *Thexder* in 1985, and Arsys Software's 3D role-playing shooters *WiBArm* in 1986 and *Star Cruiser* in 1988. Historically mecha-based games have been more popular in Japan than in other countries.^[10]



Strike Suit Zero is a 2013 space combat video game featuring mecha designs by Junji Okubo.

- A popular classic of mecha in games is the *MechWarrior* series of video games, which takes place in the Battletech universe.
- *Heavy Gear 2* offers a complex yet semi-realistic control system for its mecha in both terrain and outer space warfare.
- *Armored Core* is a mecha series developed by FromSoftware, combining industrial customizable mecha designs with fast-paced action.
- Intelligent Systems-developed and Nintendo-Published games that feature mecha include *Battle Clash* and *Metal Combat: Falcon's Revenge*, a Single-player/Shooter series Mecha of games with real robot-style All battles are fought with mechs called Standing Tanks (ST).
- Squaresoft-developed games that feature mecha include *Front Mission*, a turn-based tactical series of games with real robot-style mecha utilized by near future military forces. *Xenogears* also used mecha, called Gears, as a main aspect of the story, and the series continues the use of mecha with the Monolith Soft-developed *Xenoblade Chronicles* series.



Mecha selection menu in the roguelike-like, *GearHead RPG*.

- Older American Tabletop games, *Battletech*, uses hex-maps, miniatures & paper record sheets that allow players to use mecha in tactical situations and record realistic damage, while add RPG elements when desired.
- The games of Hideo Kojima, including the *Metal Gear* series and *Zone of the Enders*, include mecha as part of their main premise. In the former, which takes place during the modern day and near future, prototype nuclear-capable bipedal tanks called Metal Gears are a recurring element. In the latter, real robots called LEVs exist alongside a more super robot-like mecha type known as the Orbital Frame.
- In the tabletop game *Warhammer 40,000*, the forces use mecha of a variety of sizes and shapes.
- The Monolith Productions game *Shogo: Mobile Armor Division* blended Mecha game-play with that of traditional first-person shooter games.^[11]
- *League of Legends*, developed by Riot Games, include Mecha as part of champion skins, designed as super robots (Mecha Malphite, Mecha Kha Zix, Mecha Aatrox, Mecha Zero Sion, etc.).
- In *Titanfall* and *Titanfall 2* from Respawn Entertainment, mechas are heavily involved within gameplay and the story.^[12]
- *Hawken* is an online first person shooter in which pilots can choose from a variety of bipedal mechs, each having an intended specialization, to engage in free-for-all or team-based combat. Mechs have special abilities related to their role that, when activated, augment their weapon cooling, damage, defense, accuracy, mobility, stealth, or other characteristic to provide a temporary advantage.
- *Overwatch*, team shooter from Blizzard Entertainment, includes D.Va, a tank hero who pilots a mecha. Stylized as MEKA (Mobile Exo-Force of the Korean Army), D.Va's mecha provides her primary hero abilities as well as being a driver of her backstory in the game's lore.^[13] Wrecking Ball is a tank-class quadrupedal mecha robot driven by a genetically engineered hamster named Hammond. The mecha is armed with automatic assault weapons known as the "Quad Cannons", and can be transformed into a high-speed "wrecking ball" equipped with a grappling hook.^[14]
- In *Heroes of the Storm*, crossover MOBA game from Blizzard Entertainment, players can take control of the giant mecha, called "Triglav Protector", as a reward for winning objective on Volskaya Foundry battleground. The Mecha is co-piloted by two different players, the first serving as a pilot, and the second serving as a gunner. Each player is given control to a different set of unique abilities.^[15] In January 2018^[16] and June 2019,^[17] Blizzard created two "MechaStorm" events for *Heroes of the Storm*, featuring multiple mecha skins for a number of heroes, as well as other items for the Collection. A MechaStorm "anime video trailer" was also released, heavily inspired by series such as *Mobile Suit Gundam*, and *Neon Genesis Evangelion*. Mecha Tyrael, alternate version of the original *Diablo* character, represented *Heroes of the Storm* in key art for BlizzCon 2019.^[18] A playable hero Tychus can call down the Odin, a heavy combat walker, as one of his two heroic abilities.^[19]
- *Kirby: Planet Robobot* features extensive use of the *Robobot Armor*, Mecha resembling Kirby with the ability to copy enemy abilities (known as *Modes*).
- *Fortnite Battle Royale* includes a mecha called a B.R.U.T.E.

Real mecha

There are a few real prototypes of mecha-like vehicles. Currently almost all of these are highly specialized or just for concept purpose, and as such may not see mass production.

- Land Walker: A machine developed by Sakakibara Kikai with the intention of giving the impression of a bipedal mecha.^{[20][21]}
- In 2018, Japanese engineer Masaaki Nagumo from Sakakibara Kikai completed construction of a functional bipedal mecha inspired by the *Gundam* franchise. The device, standing 8.5 meters tall and weighing about 7 tonnes, possesses fully functional arm and leg servos.^[22]

In the Western world, there are few examples of mecha, however, several machines have been constructed by both companies and private figures. Timberjack, a subsidiary of John Deere, built a practical hexapod walking harvester.^[23]

See also

- BattleMech
- Kuratas
- Mobile robot
- Powered exoskeleton
- Sentry gun

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External links

- Mecha Anime HQ (<http://www.mahq.net/>): Extensive coverage on Gundams and other mecha.
 - Mecha Co. (<http://www.mechacompany.com/>)
 - Japanese Animation Guide: The History of Robot Anime (<https://web.archive.org/web/20140403002247/http://mediag.jp/project/project/images/JapaneseAnimationGuide.pdf>)
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