

SCI-FI

OBJECTS

A

PLAUSIBLE

FUTURE

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# INTRODUCTION

Science fiction (often shortened to sci-fi) is defined as a genre of speculative fiction, typically dealing with imaginative concepts such as advanced scientific technology, space exploration, time travel, and extraterrestrial life. Transforming the extraordinary into the ordinary is a recurring theme in science fiction. By virtue of its creative elasticity, sci-fi is able to make strange, implausible ideas mundane and believable. Objects in science fiction movies stretch the constraints of reality, by incorporating genre conventions such as futuristic technologies, special effects and imaginary narratives, in order to create the contours of a possible world.

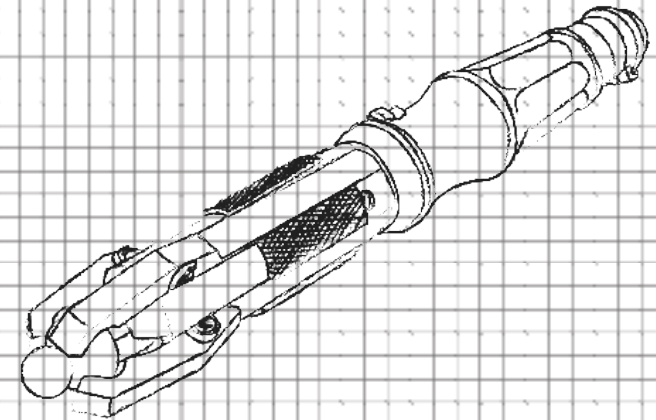
In our dictionary we have chosen objects from popular sci-fi films that have been designed as cinematic representations of technological possibilities and how they have lead to further scientific research in the real world. Our initial selection process was based on concept, form, and iconic nature of the sci-fi objects. We then categorised this list of objects under

four categories namely; gadgets, weapons, transportation and wearables. The final objects chosen present an intriguing narrative in their category and have instigated technological and design development as well as scientific research in today's world.

Science fiction draws us into the possibility that even our wildest imaginations can be realized. It proves to be useful in the design world to create prototypes in a way that helps us imagine, wonder and consider the unexpected possibilities of technology. It shapes the public's understanding on themes like artificial intelligence and medical technology which are likely to change our lives drastically in the coming decades. It is worth considering the influence science fiction has on our futures and how cautious we should be in how we consume and create it.

# SONIC SCREWDRIVER

Series: Doctor Who  
Creator: Sydney Newman  
Release: 23 November, 1963  
Function: Multi-functional gadget



# ABOUT

The Sonic Screwdriver or 'the sonic' (Fig. 1.1) is a versatile tool that appears multiple times in the series and movies of Doctor Who is used mainly by The Doctor. It first appeared in 1968 in the episode 'Fury from the Deep' but was discontinued due to a lack of creativity in the script. An improved version of the same reappeared in the new series in 2005. The sonic screwdriver can be used to unlock doors, move objects, fry circuitry and hack, disable or activate technology. It can also be used as a medical device to scan for life. It works by projecting sonic soundwaves.

The sonic was designed and manufactured by Nick Robatto for the 2005 series in Wales.<sup>1</sup> The first one took two weeks to produce. It went through multiple elaborate production processes including intricate hand sculpting, turning, shaping, hot metal casting, 3d printing, art-working, resin casting and electronics.<sup>2</sup>

The Doctor's screwdriver not only posed as an inspiration for other speculative props but

also lead to the development of analogous technologies for the benefit of the society.<sup>3</sup> Several spin-off series had devices similar to the sonic screwdriver like the sonic pen, sonic lipstick, sonic umbrella and the sonic glasses, all of which work on the same principle. The idea that sound waves carry energy has lead researchers from the University of Bristol to invent a gauntlet that can levitate and transport minute objects in the air (Fig. 1.2). The 2016 study blasted various sound waves at multiple angles and was able to lift small objects like nuts and bolts.<sup>4</sup> Although they may need a bit more aesthetic refinement, this prototype is predicted to manipulate cells, liquids, compounds or living things without touching or contaminating them. These devices could also be used to manipulate drugs inside our body without breaching any tissue.



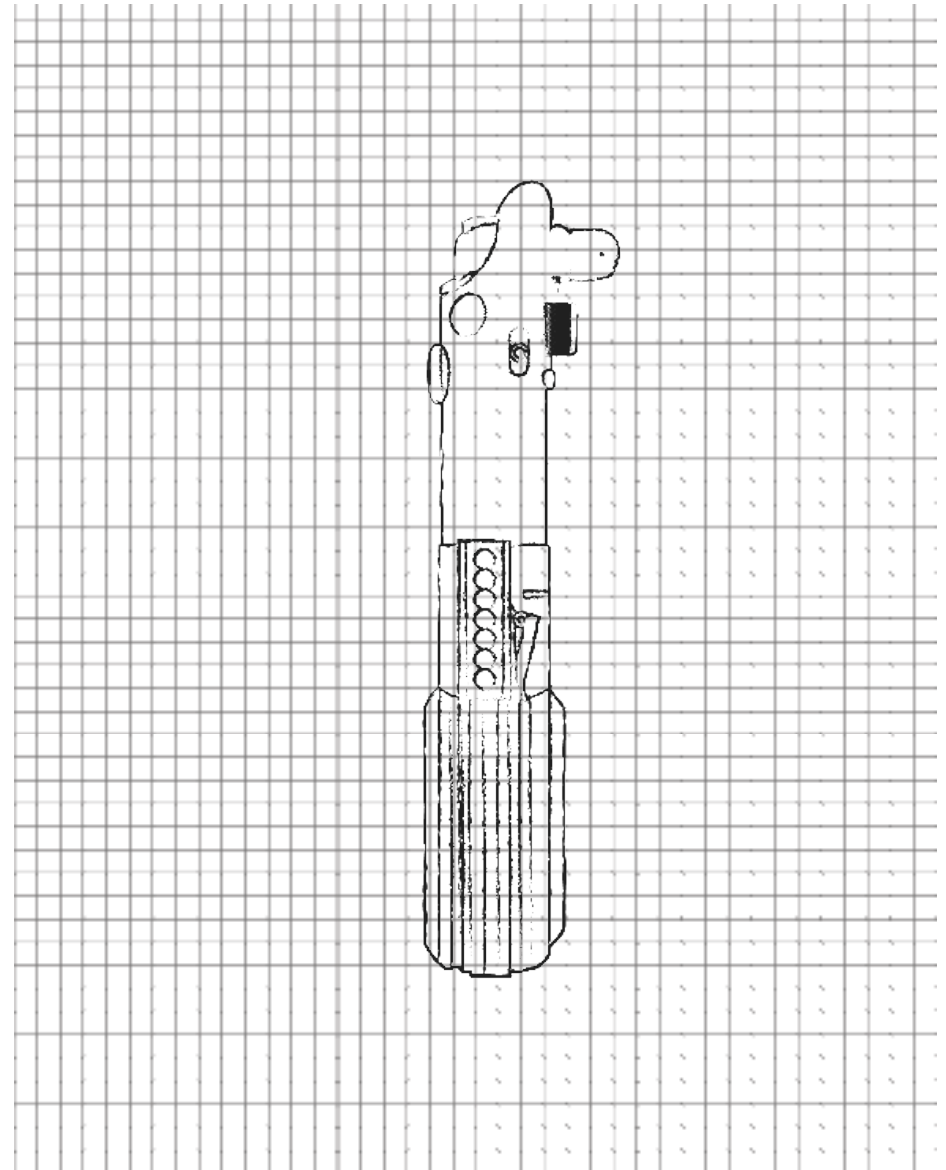
Fig. 1.1. " The 11th Doctor's Sonic Screwdriver." 2018. Web. 15 Feb 2019.



Fig. 1.2. "Gauntlets Of Levitation Or Gauntlevs." 2017. Web. 16 Feb 2019.

# LIGHTSABER

Movie: Star Wars: Episode IV A New Hope  
Director: George Lucas  
Release: May 25, 1977  
Function: Melee Combat



## ABOUT

After its invention in 1960, the laser briefly became the death ray of choice for science fiction writers, and Star Wars capitalised on it. In a galaxy far far away, the lightsaber is a weapon used by Jedi, Siths and other Force-Sensitives (Fig. 2.1). Powered by a kyber crystal, it is basically a laser sword capable of cutting through anything besides the beams of other lightsabers or very unique, rare materials.<sup>1</sup> First introduced in Star Wars: Episode IV A New Hope, the first movie of the franchise in 1977, the prop for the movie was far from elaborate, prop designer John Stears frankensteined a Graflex camera flash battery pack, T-shaped plastic sliding cabinet door tracks, a D-ring, and a few “greebles”; all held together by cyanoacrylate glue.<sup>2</sup> The laser was added later in post-production.

The Star Wars franchise has always been praised for its feminism, new and old movies alike. From Princess Leia to Jedi-in-training Rey, strong-willed women play a huge role in each and every novel or movie. A New Hope was one of the early adopters of the theme, M. Jancovich, J. Hollows 1995 states that

the “repetitive and formulaic system which reproduces the dominant ideology” only began to change in the late 1990s.<sup>3</sup>

In 2015, the US Military unveiled a Star Wars inspired tool that burns at 4000 degrees Fahrenheit and slices through steel in seconds. The TEC Torch (Fig. 2.2) was initially designed to help soldiers slice through locks and chains, but has also been picked up by firefighters, who use it for the same purpose. Powered by a cartridge, it releases a jet of vaporised metal and particulates for approximately 2 seconds, which heats the target above its melting point and erodes the target material away. EMPI, who produces the torch, have stated that their engineers have spent thousands of hours developing the TEC Torch, and in-house and outside testing has been performed to verify its function, reliability and safety.<sup>4</sup> Compared to the lightsaber, which has unlimited energy, the TEC Torch falls short, with its 2 second long lifespan per cartridge. Until we find a source of unlimited energy, small enough to fit in a hilt, a “real-life” lightsaber has yet to be made.



Fig. 2.1. “Luke Skywalker holding lightsaber.” 1977. Web. 15 Feb. 2019.

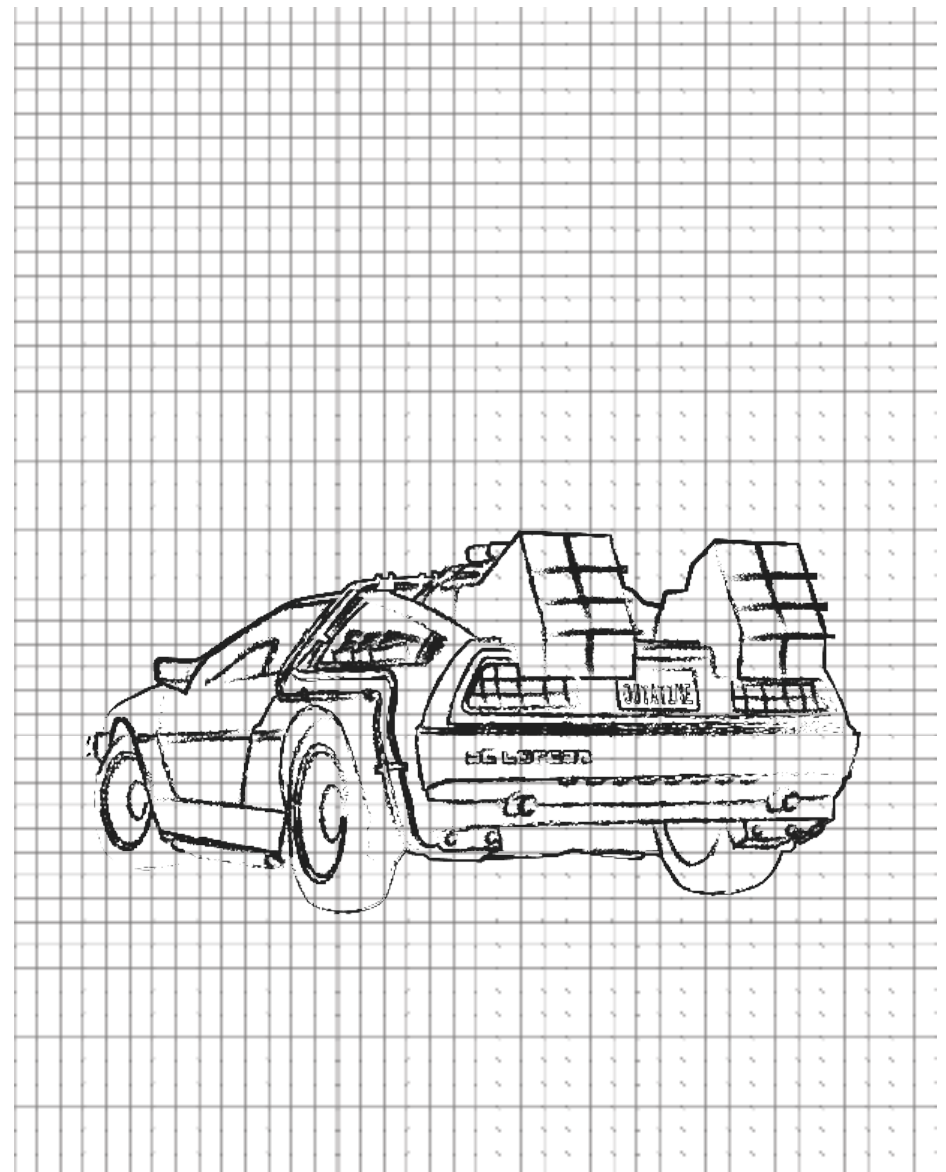


Fig. 2.2. “TEC Torch.” 2015. Web. 15 Feb. 2019.



# DELOREAN

Movie: Back to the Future  
Director: Robert Zemeckis  
Release: June 12, 1987  
Function: Versatile equipment



# ABOUT

The DeLorean Time Machine (Fig. 3.1) is identified as one of Dr. Emmett Brown's most successful inventions and was first seen in the movie 'Back to the Future' in 1985. It is a refurbished DeLorean with some extra features, including a dash rammed with every conceivable time control mechanism and a gasoline tank which accepts pure plutonium as its fuel source.<sup>1</sup> A flux capacitor is integrated in the DMC-12 sports car which must reach 88 mph in order to time travel. The time machine made it possible to travel back and forward in time.

The design of the DeLorean Time Machine was revised multiple times as every aspect of the car was thought out thoroughly by many designers. The time machine was originally meant to be a refrigerator, but the writers feared that children would start imitating the movie and get trapped inside.<sup>1</sup> At around the same time, the DMC-12 was gaining popular attention and the writers were convinced it would be perfect for the time machine because of the futuristic gullwing doors. The final time machine was designed by Ron Cobb, Andy

Probert and Micheal Scheffe. Three props were made to serve different purposes during the filming of the movie – one hero car with light effects and details inside out, one stunt car with special riggings for the fire effect and one cut up into pieces to film the interiors (Fig. 3.2).<sup>3</sup>

Although time travel devices are very far-fetched as they defy the known laws of physics, researchers from Australia and Switzerland have developed a real-life flux capacitor that can break time-reversal symmetry. The research proposes a new generation of electronic circulators which are devices that can control the direction in which microwave signals move. One of the two possible circuits also resembles cinematic flux capacitor. The combination of magnetic fields and electric charges results in the signals circulating only in one direction which could be used to control signals around extremely sensitive quantum systems.<sup>4</sup> This technology could improve mobile phones, antennas and even radars.



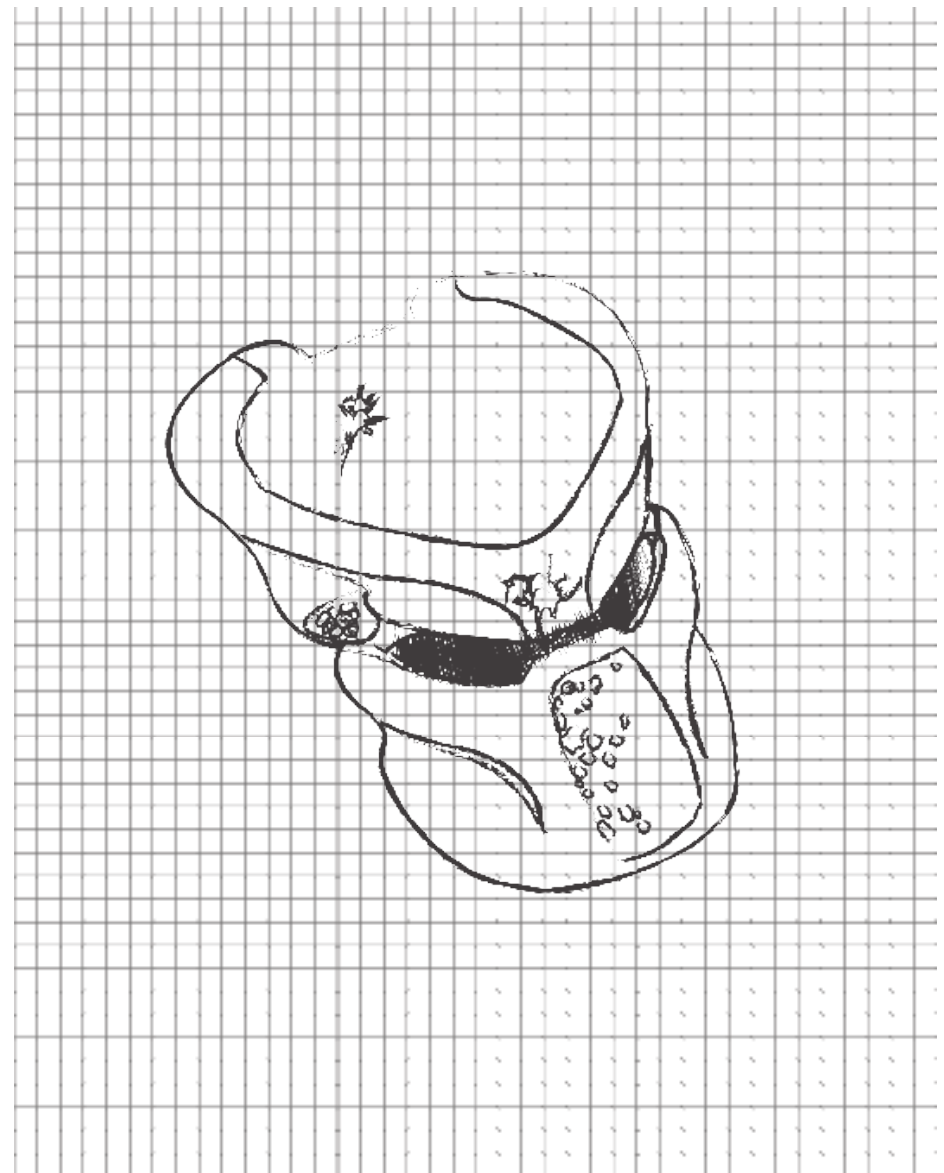
Fig. 3.1. "The DeLorean Time Machine." 2015. SPH Magazines Pte Ltd. Web. 14 Feb 2019.



Fig. 3.2. "The Interiors Of The DeLorean Time Machine." 2019. Web. 15 Feb 2019.

# BIO-MASK

Movie: Predator (1987)  
Director: John McTiernan  
Release: June 12, 1987  
Function: Hi-tech Mask



## ABOUT

'Bio-Mask' is the iconic headgear worn by predators. First Introduced in Predator (1987), Bio-mask (Fig. 4.1) is a gear that protects a predator's head with its armored plating. While linking it with Predator Wrist Gauntlet, it grants the wearer access to many functions such as different visual spectrums to see through, binoculars with telescope vision, providing diagnostics, recording audio and visuals and a breathing apparatus. Since then it has been the most versatile and indispensable tool used by predators.<sup>1</sup>

The Bio-mask is designed with the intent to fit the hi-tech look of the Predator's armor and weaponry. Sculpted by Matt Rose and painted by Screaming Mad George, the first bio-mask ever created was not launched. The coordinator of the special effects unit, Shannon Shea and the producer, Joel Silver had critiqued it to be 'intimidating and beautiful; yet functional.' It was described as revealing too much of what was going on underneath the mask, which the latter wanted to be more of a mystery.<sup>2</sup> Warwick Gould once said, "What is interesting about people in good society... the mask that each of them wears, not the

reality that lies behind the mask."<sup>3</sup> Regardless of whether it is fiction or reality, people look upon a mask by the identity it portrays, rather than the reason its worn. Several mask designs were created until it was finalized and approved.

As Hi-tech as it was during the time of release, the concept of bio-mask is closer to becoming real. 'D-mask' (Fig. 4.2), a similar concept developed by Chinese designer ZJ-DDG in 2018, is a face shield used underwater that has most of the same functions such as lighting visuals, audio, camera and diagnostic capabilities.<sup>4</sup> Yet to be released, however, the hi-tech experience it provided garnered positive attention and was deemed as possibly the future of diving and snorkeling.

Despite the similarities, the story changes as the understanding of today's technology advances. People always say that Sci-fi movies spark creations of the future. While still being just conceptual, they have proven to be worthy of discussion.



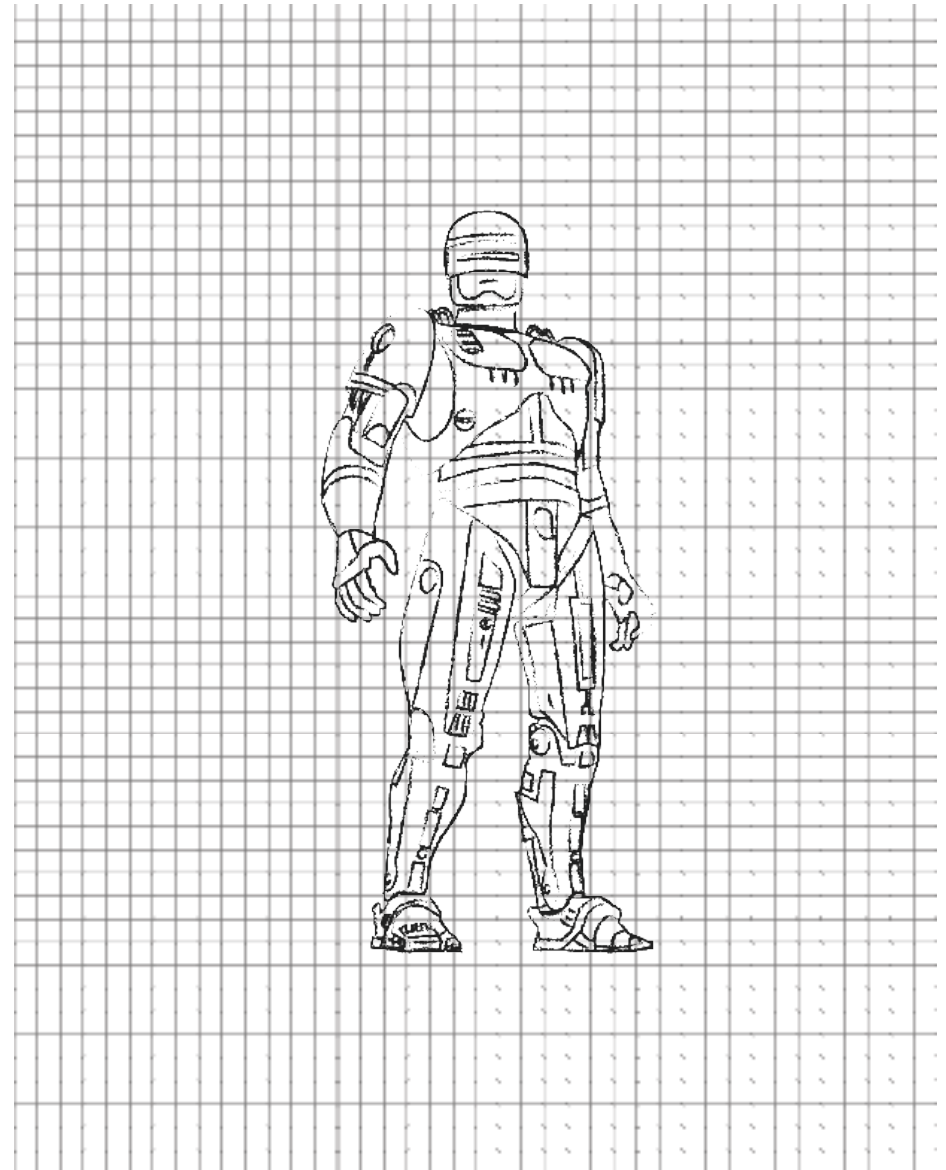
Fig. 4.1. "Predator Bio-Mask." 2015. Web. 15 Feb 2019.



Fig. 4.2. "D-Mask concept." 2018. Web. 15 Feb 2019.

# ROBOCOP

Movie: Robocop (1987)  
Director: Paul Verhoeven  
Release: July 17, 1987  
Function: Cyborg Policeman



## ABOUT

OCP Crime Prevention Unit 001, better known as Robocop (Fig. 5.1) was first featured in the movie Robocop (1987). Shot in Dallas but depicted as Detroit, Robocop (1987) portrays a dystopian America where its citizens are running wild and the police force is unable to keep them in check.<sup>1</sup>

Using the remains of police officer Alex Murphy, the scientists and surgeons of Omni Consumer Products created Robocop, a cyborg police officer who had all the mobilities of a human being (albeit robotic) and was programmed with a set of “Prime Directives”. The directives were a set of rules that were supposed to be unbreakable, which were: “Serve the public, protect the innocent and uphold the law.”<sup>2</sup> As the movie progresses, the theme of human identity is introduced, as Robocop remembers his past life as Alex Murphy, and manages to go against his programming, showing the viewers that one doesn’t actually have to be human to be human. J. Macgregor Wise 1997 states that “the human may remain interlocked with the machine, but it regains control. But what is taken to be human is necessarily constructed, ideological.”<sup>3</sup>

There were seven prop suits made for the movie, designed by Rob Bottin. With the body casts of actor Peter Weller, the main part of the suit was sculpted from oil clay with polyurethane. The black portions of the suits were cast from foam rubber, while the helmet was cast from fiberglass. Altogether, the seven suits cost an estimated one million out of the thirteen million dollars of the films budget.

Even though Robocop was just a man in a suit, in 2017 a robot joined Dubai’s police force (Fig. 5.2), as part of a government program aimed at replacing their policemen with robotic counterparts in the future.<sup>4</sup> Its motor functions were limited, only being able to shake hands and salute, and it moves on wheels. It has a camera installed that can compare faces with the police databases, flag matches to headquarters, read vehicle license plates and can send a live video feed to watch for risks, such as unattended bags. Although still far from what Robocop was able to do in the film, it is a step towards what the future could be.

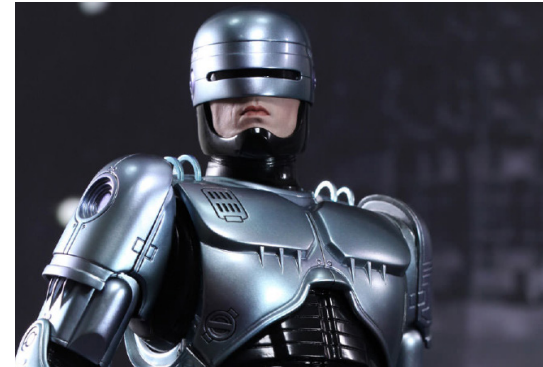


Fig. 5.1. “Robocop”. Online Image. Web. 15 Feb. 2019.

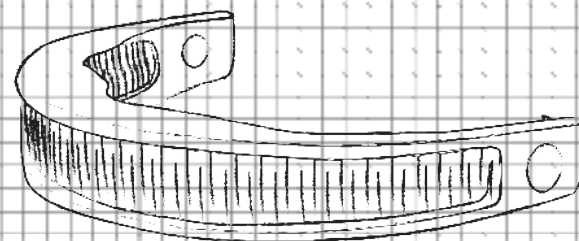


Fig. 5.2. “Dubai Police Robot Saluting.” 2017. Singapore Press Holdings. Web. 15 Feb 2019.



# VISOR

Movie: Star Trek: The Next Generation  
Director: Winrich Kolbe  
Release: 28 September, 1987  
Function: Medical Device



## ABOUT

The VISOR (Visual Instrument and Sensory Organ Replacement) featured in Star Trek: The Next Generation is a medical wearable device that provides the visually impaired with a “sense” of sight.<sup>1</sup> In the television series, it is worn by Geordi LaForge, played by actor LeVar Burton.

VISOR (Fig. 6.1) operates by scanning the electromagnetic spectrum, creating a visual input and transmitting those inputs into LaForge’s brain via the optic nerves. Sensors are located on the convex part of the wearable covering the eyes and are attached at small input jacks implanted in the temples. VISOR does not reproduce normal human vision, instead it enables LaForge to “see” energy phenomena visible to the naked eye, such as infrared and ultraviolet rays. This device facilitates LaForge to see humans’ heart rate and temperature, giving him the ability to monitor moods and even detect lies.

Production designer Herman F. Zimmerman’s design of the VISOR was inspired by a woman’s barrette.<sup>2</sup> The “barrette” structure was

made from solid cast aluminium with brass rods embedded in between. Connection points on the sides of LeVar’s head representing the “sensors” were created using light emitting diodes. Wires connecting the LEDs ran through his hair and down the back of his neck to a small battery pack underneath his arm. LeVar’s nose rested on an inset in the wearable. An elastic band stretching from the prop to behind his ear enabled him to wear the piece.

Amongst the many research-based innovations fabricated from VISOR’s technology, the Argus II Retinal Prosthesis System (Fig. 6.2) is the most progressive.<sup>3</sup> Designed by Second Sight Medical Products, Argus is an implant, camera, and visor system that acts like a bionic eye: a device that assists in improving or restoring vision. The implant uses information from the camera to activate the light detection cells in the eye. Argus has helped the visually impaired to detect objects in motion, which is groundbreaking in the medical industry.<sup>4</sup>



Fig. 6.1. “LeVar Burton wearing the VISOR”. 2016. Web. 10 Feb 2019.



Fig. 6.2. “Argus II Retinal Prosthesis System.” N.p. 2018. Web. 10 Feb 2019.



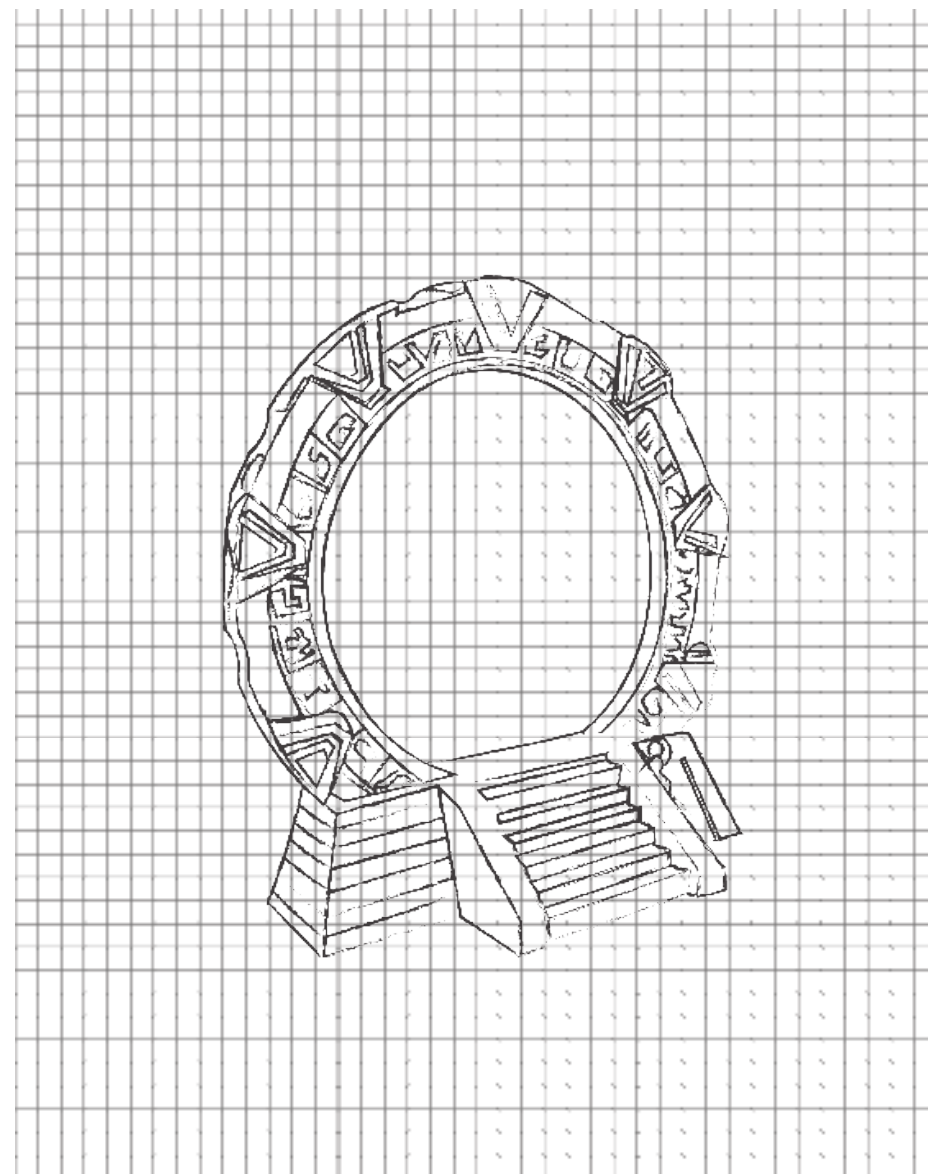
# STARGATE

Movie: Stargate

Director: Roland Emmerich

Release: October 28, 1994

Function: Transportation Device



## ABOUT

Set in the fictional universe, the Stargate device (Fig. 7.1) first appeared in Stargate (1994) film as a portal that transports characters across interstellar and extragalactic distances. One of the lines by Samantha Carter in the series, "We're going to be demolecularized, transmitted over two thousand light years through subspace, and then, uh, rematerialized on the other side."<sup>1</sup> Stargate works by creating a wormhole on its ancient ring-shaped frame, enabling almost instantaneous travel to a similar device elsewhere in the universe thereby allowing the characters in the show to visit alien planets without the need for spaceships or any other types of technology.<sup>2</sup>

The series relied heavily on the Stargate props for its background filming. Lead by production designer Richard Hudolin, two Stargate props were built. They are both 22 feet (6.7 m) in diameter, made of fiberglass and steel. While the primary one is fully automated and capable of rotating and emitting light, the second one is less detailed and is used for exterior scenes.

Although more Stargate props were made, they were two dimensional or semi-three-dimensional to make them easier to erect on location.<sup>3</sup>

In today's understanding, though hard to believe yet, the idea of travelling through hidden portals is a highly speculated and hypothetical one. According to a NASA article featuring Jack Scudder of University of Iowa, "the portal - an extraordinary opening in space or time that connects travellers to distant realms. A good portal is a shortcut, a guide, a door into the unknown. If only they actually existed...It turns out that they do, sort of (Fig. 7.2)."<sup>4</sup> Though it may exist in reality, however, are not widely held to be true that such phenomenon could safely transport someone.<sup>5</sup> Till further tests and studies of such phenomenon are proven, the gap between fiction and reality will then be drawn closer.



Fig. 7.1. "Stargate in operation, US, 1994". 2019. Web. 15 Feb. 2019

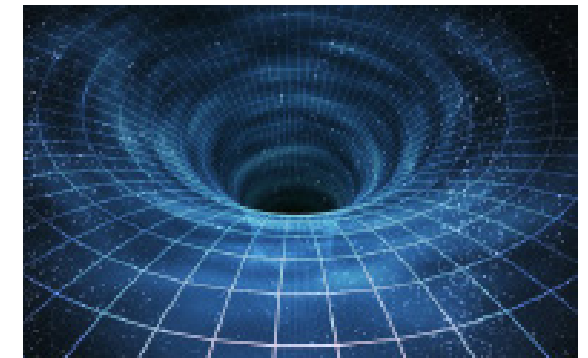


Fig. 7.2. "Wormhole - Ripples in Space." 2019. 15 Feb 2019.

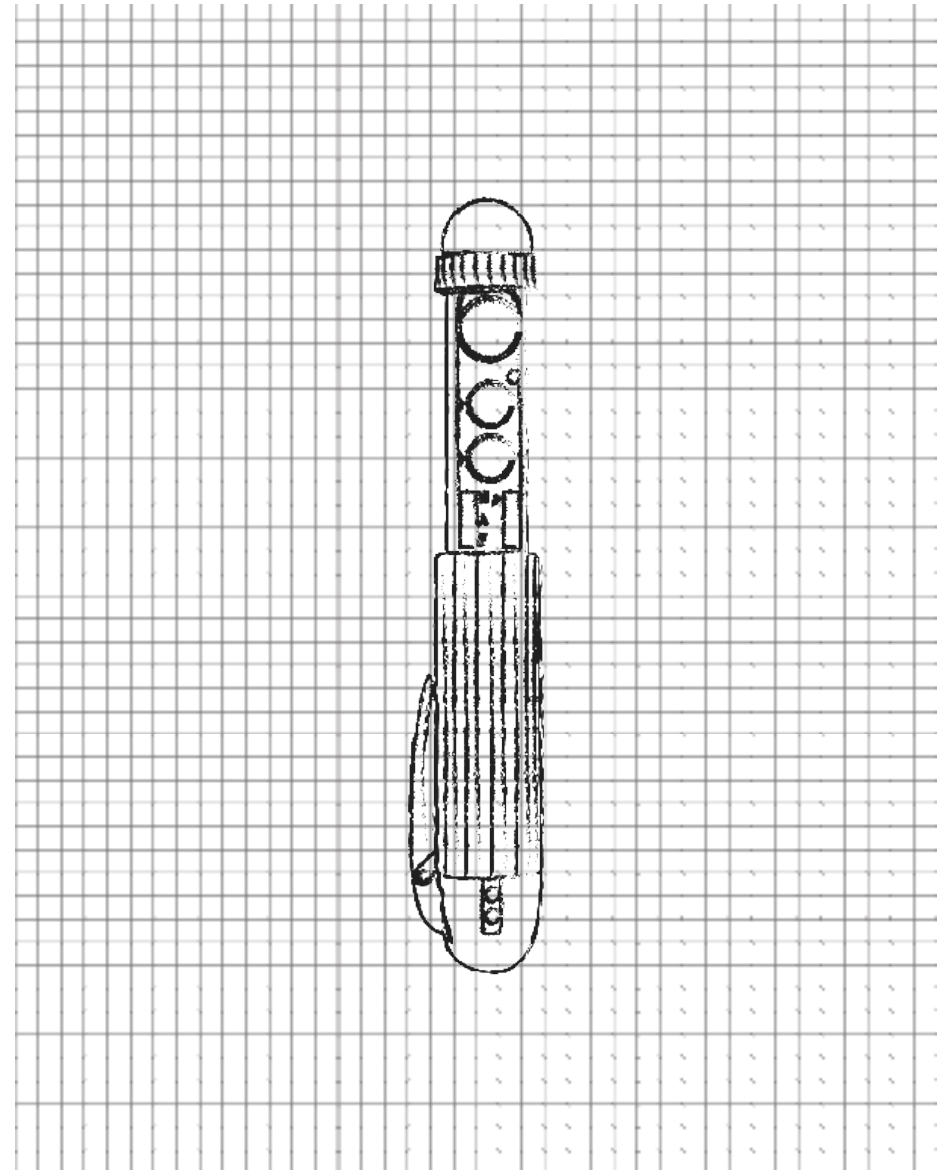
# NEURALYZER

Movie: Men in Black

Director: Barry Sonnenfeld

Release: October 31, 1997

Function: Handheld Memory Removal Device



## ABOUT

A Neuralyzer wipes the memory of a target or witness, putting them under a hypnotic state and making them susceptible to suggestion and implantation of false memories. It is used by the Men in Black, a top-secret government agency, as a moral substitute to witness elimination by murder. It functions to keep both the agency's existence and the presence of aliens on Earth unknown to the public.

The device cannot delete a specific memory; it can erase all memories formed during a chosen time span up to the moment of its use. The set length of memory erased ranges from minutes to years and can be changed using dials. The device works by producing a bright, noisy flash similar to that of a camera. To avoid its effects, agents wear deeply tinted Ray-Ban sunglasses (Fig. 8.1) that deflect the light rays. Tinted sunglasses on special agents is a ubiquitous feature in movies, however here it functions as a vital protective accessory that is only used when the Neuralyzer activated.

Robert W. Welch III was the production designer for the first three movies in the Men in Black franchise and realised the design of the first neuralyzer. The pen-like device

(Fig. 8.2) is crafted from high quality diecast and machined brass and aluminium alloy which is then chrome plated.<sup>1</sup>

The idea behind and the functioning of the Neuralyzer is synonymous with cinema's fascination with memory and its potential to disturb prevalent at the time the movie was released.<sup>2</sup> Science fiction has long been interested in the possibilities of technological development that might manipulate memory. These ideas depicted through objects such as the Neuralyzer have led to the development of scientific research frameworks that inquire into similar concepts today. Researchers at the University of California, Davis, have successfully erased specific memories from the brains of mice by using beams of light.<sup>3</sup> The experiment was conducted using Optogenetics, in which the light is beamed into the brain using a fiber optic cable. Although it is only a scientific experiment conducted in a laboratory and not a sleek pen-like device yet, it is still one step closer to making science fiction a science fact.



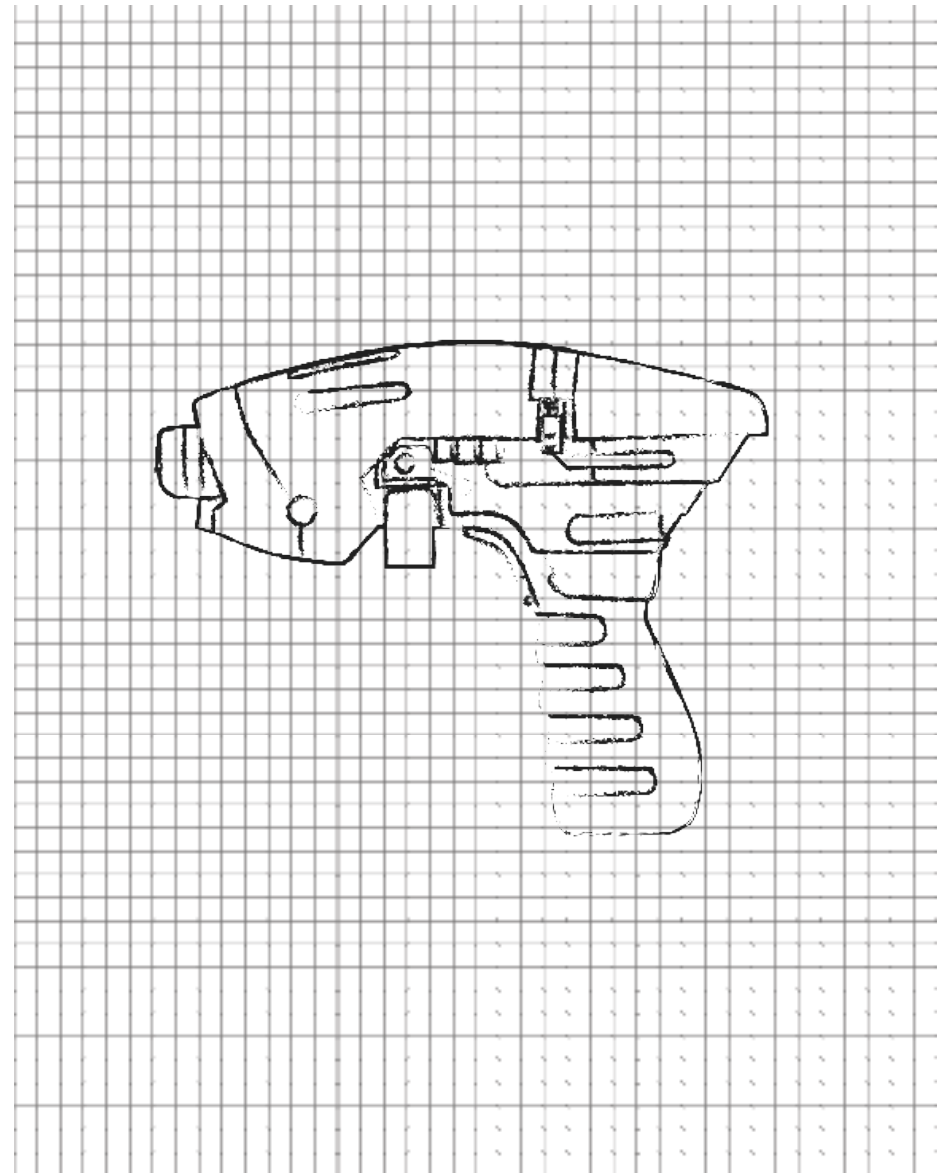
Fig. 8.1. "Agent K using the Neuralyzer in Men In Black (1997)." 2013. Web. 13 Feb. 2019.



Fig. 8.2. "The Neuralyzer Features A Compact Pen Like Design." 2015. Web. 14 Feb. 2019.

# PHASER PISTOL

Series: Star Trek: Enterprise  
Creator: Rick Berman, Brannon Braga  
Release: 26 September, 2001  
Function: Phase Energy Weapon



## ABOUT

The phase-pistol (Fig. 9.1) is a directed-energy weapon that emits energy in an aimed direction without the means of a projectile. The iconic Starfleet personnel sidearm, is characterized by a focused energy discharge in the form of a steady stream or a phase pulse. It has two settings, stun and kill. The phaser can also be used to light a fire, to clear obstructions of rock and earth, and as a cutting tool. By cross-polarizing the power cells to increase particle yield, the weapon can be modified to be more effective against shields. A phase-pistol can also be set to overload and function as an explosive device.<sup>1</sup> This versatile range of functions indicates that the pistol's intended effects may be non-lethal or lethal.

The weapon features in various episodes of Star Trek: Enterprise for use by characters in the series in defending the "Enterprise NX-01" or themselves. The futuristic sidearm is designed and made by Los Angeles-based prop weapons specialist Independent Studio Services. It features moulded foam rubber with a painted black handle and painted metallic

silver weapon housing. The phase pistol is sealed closed at its hinge and comes with a black vacuum formed plastic holster moulded to share the detail of the pistol.<sup>2</sup>

The idea of non-lethal, directed energy weapons has led to the real time military applications. The United States' Army has tested a new weapon that shares its name with the handheld phaser of "Star Trek" fame. Developed by Raytheon, the Personnel Halting And Stimulation Response (PHASR) rifle can disable drones and virtually anything electronic with a sweep of its four-foot dish. It is a high-powered microwave radiation transmitter parked on top of a 20-foot shipping container (Fig. 9.2).<sup>3</sup> Not limited to drones, it can disable anything that uses integrated circuits, such as cars and mobile phones. In the complex battlefields of today it can be used to disable a car speeding towards a friendly checkpoint without having to shoot the occupants.



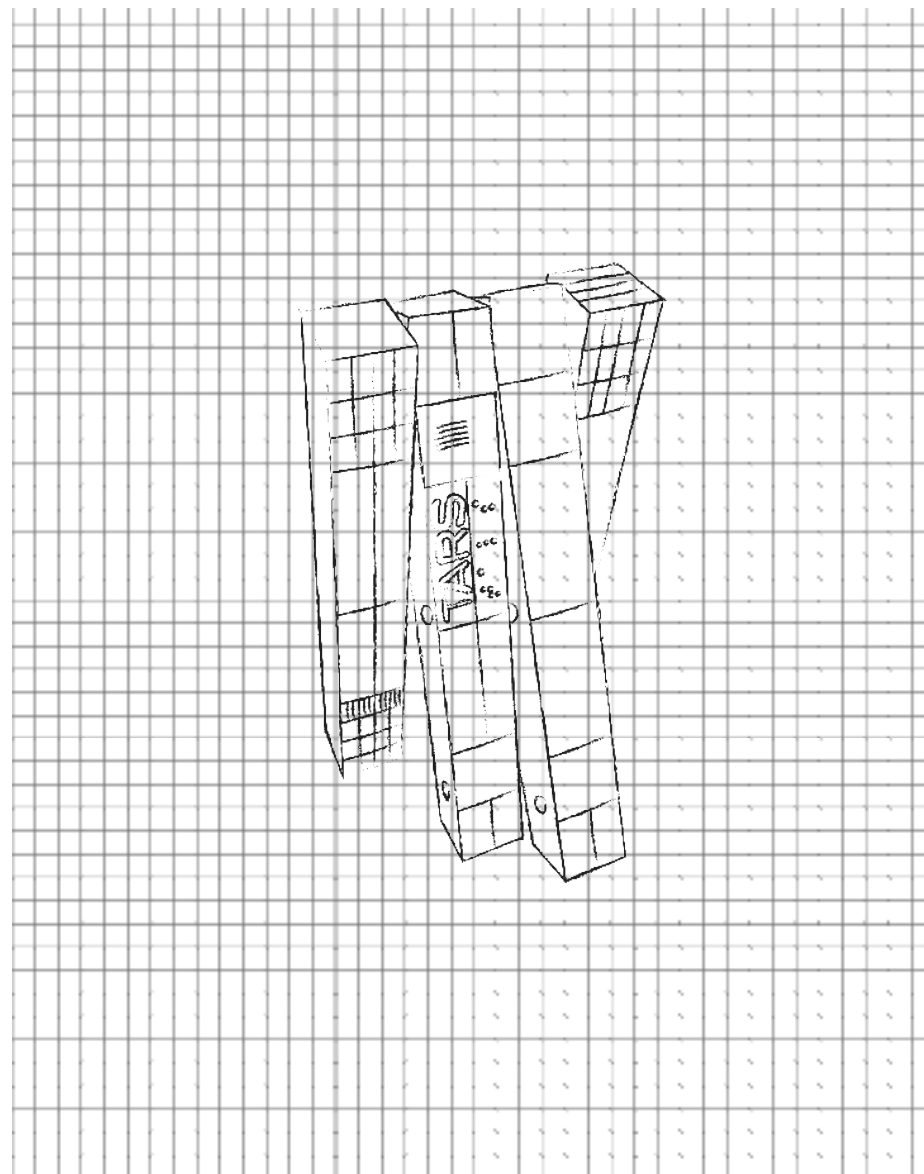
Fig. 9.1. "Starfleet Phaser Pistol." 2019. Online Image. Web. 14 Feb 2019.



Fig. 9.2. "Raytheon's PHASR." 2017. Web. 14 Feb 2019.

# TARS

Movie: Interstellar  
Director: Christopher Nolan  
Release: November 6, 2014  
Function: Assistant AI Robot





## ABOUT

Sci - Fi blockbuster *Interstellar* features a former US Marine Corps AI robot called TARS (Fig. 10.1), who at present, assists and serves as a companion for the people working at NASA. He also pilots spaceships and collects data.

TARS's structure is an aluminium chassis housed in four rectangular slabs of stainless steel which are connected to each other through hidden pivots. These pivots enable TARS to morph into different gaits like a two legged stride, a crutch walk and a four legged gallop.<sup>1</sup> Besides locomoting, he speaks and understands English fluently. TARS has honesty and humour settings that can be maneuvered by the crew members.

For *Interstellar*, four stationery puppets of TARS in different stances were made while one of them was operated manually and in voice, by comedian Bill Irwin. Production designer Nathan Crowley took an architectural approach while designing TARS by adopting Van der Rohe style. Therefore, TARS's structure appears simple and geometric yet is versatile in the way it operates.<sup>2</sup> As Crowley wanted

to eliminate any trace of anthropomorphism in the design, TARS is based on functionality which juxtaposes the quintessential belief that science fiction has, of robots being humanoid in form, like C-3PO in *Star Wars*.

*Interstellar*'s depiction of TARS highlights a key feature of what the future of assistant robots should be, which is solely functional instead of self aware.<sup>3</sup> Furthermore, making AI robots like TARS that are deprived of survival instinct, is beneficial in the preservation of an anthropocentric world as robots are merely machines made to assist humans and not replace them.

At present, a Japanese robotics firm called Schaft, has created a robot (Fig. 10.2), that bears a striking similarity to TARS. It can climb up stairs, navigate complex obstacle courses and even traverse across different terrains.<sup>4</sup> However, TARS's capability of having a conversation and fully comprehending what is being said, is an AI concept in robotics that will probably take hundreds of years to understand and implement.



Fig. 10.1. Warner Bros. Entertainment Inc. and Paramount Pictures Corporation. "TARS." 2013. Web. 10 Feb 2019.

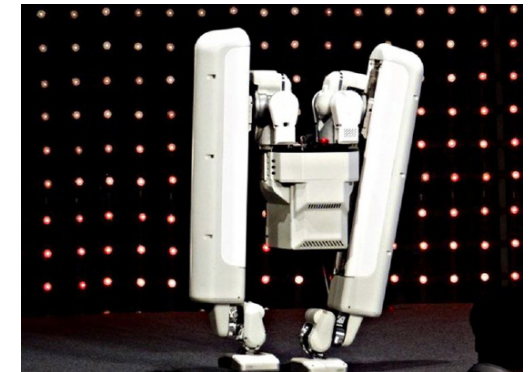


Fig. 10.2. "Google-owned Japanese robotics firm Schaft has unveiled a bipedal robot that can navigate any territory and even squeeze between seats." 2016. Web. 15 Feb 2019.



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### Robocop

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