Historical Accuracy Evidence Document - UK Edition

Tech Tree

Achilles

Developed on the basis of the M10 Wolverine, several hundred were put into British service under the Lend-Lease program called the 3in SP (3 inch Self Propelled). These were assimilated as SPGs and saw service in 1944 in Italy and France. The tactical organisation was four battery regiments, with some alternating two towed 17-pdr batteries, and two 3in SP batteries. These would later be rearmed with the 17 pounder gun which was significantly more powerful. About 1100 machines were converted in mid-1944, it was done by the Royal Arsenal in Woolwich, and became the second most common British/Commonwealth tank hunter after the FIrefly. There were a couple of subtypes - IC and IIC and these designations were based on the type of counterweight/turret. In addition to this, some M10s were converted in-theatre with a conversion kit. Some Achilles were also used by the Israeli in 1956 and 1967.

A picture of the tank

AEC Armoured Car

AEC (Associated Equipment Company) of Southall was already well known for producing buses and trucks, including the famous London double-deckers. However, when the war started they shifted focus to military trucks, building around 10,000 vehicles by 1944. These included the 10-ton 4x4 Matador and the 6x6 AEC Marshall. There was already a heavy armoured car design using the 4x4 Matador chassis so the company could obtain an order from the Army. The vehicle was shown publicly in London in 1941, and Winston Churchill loved the design so much that the order was secured.

The Matador itself already had a powerful engine and solid transmission, which allowed the engineers to be creative with the armament and armour. It was always the idea of the Chief Designer to produce a wheeled vehicle to keep costs low. Compartmentalization was also easy, with the chassis and hull allowing the tank to be deeper and roomier than the Valentine. The turret ring was also identical to that of the Valentine, pointing towards the possible mounting of that turret.

The frontal armour was 2.56 in thick and well sloped, meaning the tank possessed superior protection to any other armoured car built by the Allies at the time. The engine, as stated above, was originally the AEC 7.6l Diesel making around 95 hp, however later it was replaced by the more reliable AEC 190 Diesel which made 105 hp giving the tank 9.5hp/t. This allowed the tank to reach speeds of between 58 and 65 kph.

The suspension consisted of leaf springs with prop shaft splines that allowed some leeway to the transfer case. The wheels were turned by cross rods allowing them to replicate the move from one wheel on the other.

There were three (technically four but that doesn't count) evolutions of the AEC Armoured Car. The Mk. I had the AEC 190 Diesel and mounted a 2-pdr gun inside the turret, this variant we do not have in-game. The Mk. II, which had the AEC 195 Diesel making 158 hp, had a better armoured turret which mounted a more powerful 6-pdr gun. And Finally the Mk. III, this variant was upgunned again to the ROQF 75mm gun.

AEC's were mostly used in the latter part of the African Campaign until the end of the Tunisian Campaign. Most Mk III's were in service until the war's end and were phased out. However some remained in service in various armies until 1958 where they were gradually replaced by the Alvis Saladin. In total, 629 vehicles were built between 1941 and 1944.

AT-2

Developed in May 1943 as an assault tank intended to break through enemy defensive lines. The tank had torsion bar suspension and was introduced alongside the AT-1 Design. The AT-2 differed by way of having a casemate on top of the hull which made it 4t lighter than the AT-1. Both the AT-1 and AT-2 designs were built to house either 76.2mm guns or 95mm howitzers. No prototypes were built, however the basis of the design was used in future projects towards the A39 Tortoise.

AT-7

Developed in May 1943 as an assault breakthrough tank. The AT-7 was the weirdest of the bunch, mounting a 6-pdr as its main armament. It was pretty much just a reworked version of the AT-6, where the developers decided a 6-pdr on a sponson mount and many many MGs was a good idea. Soon after they realised how impractical the idea was and returned to the 6-pdr. But they didn't want to waste the sponson so they fitted a 20mm autocannon to it. It was later reworked again in June 1943 which changed the superstructure and the machine gun turrets. The vehicle was said to likely weigh around 43.5t, there was a lighter variant, named AT-7A, which weighed 41.5t. No prototypes were built, however some parts of the project were used in the A39 Tortoise. I don't know if the autoloader was planned or not.

AT-8

Designed in late May 1943. (You get the point here). It was designed by Nuffield (like the other ones). The AT-8 was essentially the sister project of the AT-7, mounting the same 6-pdr gun but in the centre of the vehicle rather than the far right side. The 20mm Polsten autocannon was also moved from the left sponson to the right. No changes in armour, keeping the weight around 41t. No prototypes were built because they proposed other projects. All of these projects progressively contributed to the A39 Tortoise project.

AT-15

Developed at the end of 1943 and the 3rd to last of the AT series of projects. (There were 16 in total). The AT-15 was equipped with the 17-pdr gun and was the result of the army getting pissed at Nuffield because they loved placing the gun on either side but not the centre. The last asymmetrical vehicle being the AT-14. The frontal armour was said to be around 152mm on the front, and 101mm on the sides. It was said to weigh around 60t, around the same as the AT-14. There was also a lighter variant of this vehicle, designated AT-15A. The AT-15 variant eventually turned into the A39 Tortoise heavy assault tank project. (I'm sorry for the repetition…)

AT-FV230 Breaker

Fictional Tank based on the MBT-85 casemate tank destroyer, which was a project from 1973 based on the Chieftain. The FV230 is fictional due to being longer and based on the FV230 Canopener hull, however the inspiration is clear.

A picture of the MBT-85 "Vindicator"

Badger

A proposal for an assault tank destroyer, similar to the A39 Tortoise that was based on the Conqueror/FV201 chassis. The version we see in-game is based on the wooden mock-up of the FV205 while the name is from the later project. They were both intended to be casemate tank destroyers on the FV201 chassis (this would become the FV221 Caernarvon and FV214 Conqueror). The model of the FV205 was built in 1947 but cancelled in 1949. The armament of the FV205 is unknown. The FV217 was a proposal to mount a 120mm cannon on the same chassis. There is no official name for the FV205. The 123mm QF is a real gun, but it is unknown if it was actually intended for either tank.

A picture of the model

Another picture

A reference of the 123mm QF

Reconstruction of the design

Bishop

The QF 25-pdr howitzer has been the backbone of the Royal Artillery since 1940, however, in 1941 the North African desert showed the importance of quick deployment of artillery. One of the solutions for this was a self-propelled howitzer. This led to a requirement for such a vehicle using the aforementioned 25-pdr gun. And by June 1941, the Birmingham Railway Carriage and Wagon Company won the bid, quickly producing a prototype by August the same year. This project had the official designation "Ordnance QF 25-pdr on Carrier Valentine 25-pdr Mk. I" The nickname 'Bishop' came from the infantrymen being supported by this howitzer.

The tank was required to be very quick and affordable. So, BRC wisely chose the Valentine Mk II chassis and mounted a fixed superstructure on the top. The Bishop was very tall, and was quite a bit heavier, causing the suspension and driveline to be stressed, which lowered reliability and top speed. Another problem with a fully encased superstructure was that the elevation was only 15 degrees, which limited effective range to 5,800m, which was half as far as its towed counterpart.

The tank was quickly put into production in July 1942, with 80 being delivered, and 200 more being ordered by early 1943. However, the new American M7 105mm SP Gun or “Priest” was becoming largely available to the British through the Lend-Lease program, this basically killed the Bishop, and as it was lost it was gradually replaced with this tank. Despite this, the Bishop fought well during the entirety of the North African Campaign, and went even further into Sicily and Italy. By the end of 1943, 149 of these were built.

Black Prince

Developed in 1943 by Vauxhall, it was designated A43, and was one of the first tanks designed specifically to mount the new 17-pdr gun, it was stated on 16th September 1941, that a long term desire was to have the Mk IV Churchill mount a 17-pdr gun. The Black Prince ultimately would’ve been the last “infantry” class tank to go into production.

The tank was borne after the realisation that the Churchill tanks did not lack armour, they lacked firepower, and there were various attempts at mounting more powerful guns, such as the QF 75mm, or the 6-pdr gun, but these couldn’t offer the punch or penetration needed to face Tigers or Panthers. The A43 was originally nicknamed “Super Churchill”, and aimed to keep the same survivability of the Churchill, but with a more potent gun being the 17-pdr.

The hull of this tank was similar to the Churchill, the overall shape and suspension was similar, and the crew hatches were also the same. The hull armour was also identical to the later model Churchills, being 152mm (6 inches) thick at the front. The front of this tank was also slightly lowered, and the driver's position moved forwards to improve his vision past the tracks.

To cope with the increased weight, the running gear and hull were strengthened, however the suspension was similar, the tracks were widened to help with weight distribution. The vehicle would be powered with the same Bedford 12-cylinder engine. This had 350hp, but the tank was 10 tonnes heavier than the already underpowered and slow Churchill. The top speed of this tank was around 16.8km/h, it retained good climbing ability, it was just extremely slow. There were plans to mount a 600 hp Rolls-Royce Meteor engine, which would’ve given a top speed of 35 km/h, however this would’ve had to be fitted at a leaning angle as there wasn’t enough clearance between the floor of the tank and the roof of the engine bay. Another issue with the tank was the five speed gearbox, which was far too close together, to avoid stalling the engine, the driver had to change gears in 1.5 seconds, this was very commonplace in a tank that was already chronically underpowered for the weight.

The turret of this tank was an unused design for the Centurion initially and this would also be a similar design to that mounted on the Comet. There were even plans to mount the Centurion Mk 1’s turret onto the Black Prince Chassis, this never happened though. The hull was made 10 inches wider than the standard Churchill, to accommodate for the larger turret and turret ring.

As mentioned, this tank had the 17-pdr gun, which was a massive upgrade over the Churchill. The specific 17-pdr for this tank was the Mark VI, which had a shorter breech to allow for more operating room inside the tank. There were plans to mount a 32-pdr gun in the Black Prince, but this would've required an even larger turret.

The tank ultimately never saw service, it was outdated as soon as it was designed, by 1945, there were numerous 17-pdr tanks in service, such as the Challenger, or the Sherman Firefly. The Centurion was ending its development towards the end of the war, and this surpassed the Black Prince in almost every way, with similar armour, the same gun and was still 20km/h faster. A total of 6 prototypes were built, however only the 4th one survives, it's in running condition. Parts for the other prototypes still exist as well.

A picture of the tank

Rear View

Front view

Sketch of internal turret layout

Caernarvon

Developed as part of the FV200 series which started in 1944. The Caernarvon was developed in 1950 whilst the Conqueror was in development, this project was created because it seemed the Conqueror was a long way off production and as such the Caernarvon was aimed to speed up development of the Conqueror whilst giving crews the experience of operating the vehicle.

The Caernarvon used an FV214 hull, similar to the Conqueror, but mated to a Centurion Mk III turret and armed with a 20-pdr gun. Interestingly, it is unknown what hull thicknesses the vehicle had, the FV201 had 76 - 89mm on the front of the hull, whereas the official requirement was 130mm sloped at 60 degrees. The documentation seems to contradict or even get values completely incorrect. And this applies to plans as well.

It was intended that 160 Caernarvons would be built, in an effort to begin troop trials, there were no pre-production versions, and the first two prototypes would be used for component testing only.

The Treasury would learn of the cost of building one of these vehicles, a Centurion would cost £45,000 back then (£1.4 million today), and the Caernarvon would cost £70,000 to build. At the same time, the Treasury was doing a wide-sweeping cull of army tank development, and this cancelled a number of different projects including the FV217 and Conway, and reduced the number of vehicles to be built for the Caernarvon to 70 initially, and then later reduced to just 10.

Consequently, only 11 vehicles would be built, and would briefly be in service until 1955, when they were all - except the prototype - converted to the Conqueror. The only Caernarvon left would be turned into a gas turbine test bed, before later being scrapped in the late 1990s.

Picture of the blueprints

A picture of the tank

Cavalier

In mid-1940, the British Directorate of Tanks and Transport defined the development of several new tank designs centered around the new QF 6-pdr AT gun. Among these was a tank designated the A24 Cruiser, intended to replace the Crusader. Two firms were contacted who previously worked on the Cruiser Mk VI. Those firms were Nuffield Mechanization & Aero Ltd, and Birmingham Railway Carriage and Wagon Company (BRC&W). Nuffield initiated work on the A24 in late 1940, incorporating plans featuring the 410 hp Liberty engine, 70mm of frontal armour, and a larger turret ring to integrate the 6-pdr gun.

In January 1941, the Tank Board decided to fast-track production of the A24 by adapting an existing design, which bypassed the extensive prototype testing. Nuffield was then tasked with building six pre-production units, with the design, initially known as the “Cromwell”, was handed off to Ruston and Hornsby for mass production.

However, delays plagued the A24 project due to competing priorities, with the main concern coming from the Crusader’s conversion to mount the 6-pdr gun. Initial trials of the A24 in 1942 also revealed severe issues with the Nuffield Liberty engine.

Meanwhile, BRC&W pursued an alternate approach, instead opting for the Rolls-Royce Meteor engine derived from the Spitire’s Merlin engine. Unfortunately, despite its potential and its far greater output compared to the Nuffield Liberty,Leyland engineers (responsible for the transmission) expressed doubts and advocated for the Liberty. Because of this, three related designs diverged: The A24 Cavalier, A27L Centaur, and the A27M Cromwell. All three were originally designated as Cromwell, however to avoid confusion, the general staff designated them with those unique names.

The A24 Cavalier resembled the Crusader in size, but featured significant redesigns. The hull was constructed from Welded and bolted RHS, with the front glacis plate having an impressive 76mm of armour. The nose was sloped and the sides flat with an unknown thickness.

The drivetrain used six large rubberised road-wheels, with a rear sprocket, front idler, and narrow track links similar to those on the Crusader.

The Cavalier mounted the QF 6-pdr L/43 gun, which was a significant improvement in firepower over the Crusader. Having a muzzle velocity of 850 m/s with its solid projectiles, however it also had the ability to fire 1944 APDS which increased its muzzle velocity to a cool 1,151 m/s. The gun is capable of defeating armour up to 85mm in thickness at 100m.

The turret on the Cavalier accommodated three men and had a hexagonal boxy design which featured an internal mantlet and 50mm thick bolt-on appliqué armor, this became a major characteristic feature of the 1942 cruiser tanks.

Secondary armaments included two BESA machine guns, one manned by the co-driver and the other by the gunner as a coax.

The Cavalier was divided into the driving compartment, fighting compartment, and engine compartment via bulkheads. The engine compartment housed the 410 hp Liberty engine which was mated to a Wilson epicyclic Leyland transmission, which included pneumatic assistance for steering and braking.

An initial order for 500 Cavaliers faced production delays, with manufacturing commencing around mid-1942 and continuing into 1943. However, by that time, more advanced designs rendered the Cavalier obsolete. The existing vehicles were repurposed into two main variants. The Observation post, equipped with a dummy gun and additional radios, and the ARV variant, which had no turret and had a recovery jib. These variants saw active service in the European theatre until 1944. The main issue pertaining to the retirement of the vehicle was the constant reliability issues, mostly stemming from the Liberty engine. In total, 500 (the initial order) were manufactured.

Historically, the Cavalier used the upgraded turret in-game, but the stock turret was able to carry all guns available in-game. The in-game equipment is also a mix of the Centaur (75mm and 3.7in howitzer) and the Cavalier (Which only had the 6-pdr).

Picture of the Tank

Centurion I

In 1943, the Directorate of Tank design, led by Sir Claude Gibb, was asked to produce a new design for a heavy cruiser tank under the General Staff designation A41. After a series of fairly mediocre designs within the A series in the past, the War Office demanded a major revision of the design requirements, specifically focusing on increased durability and reliability, the ability to withstand a direct hit from a German 88mm whilst providing greater protection against mines, while remaining within a maximum weight of 40 tons.

Shortly after the programme commenced, it became glaringly obvious that the requirement to withstand an 88mm round was impossible to meet within the permitted weight. This weight limit was set by the transport trailers that would be used. However, the War Ministry decided it would be wiser to build new trailers rather than hamper the design.

Even before prototypes of the 40 ton version were built, the design of a heavier variant was well under way. With this new variant carrying equivalent armour to that of the heaviest infantry tanks, while boasting improved suspension and engine which provided cross-country performance better than that of even the early cruiser tanks. This led to the designation of “Universal Tank” being adopted.

A larger hull was produced, based on the Comet. Using its long-travel five wheel suspension, while adding a sixth wheel and extending the spacing between the second and third wheels. The hull was redesigned with welded, sloped armour that featured a cast turret which mounted the 17-pdr main gun with a 20mm Polsten cannon independently mounted to the left.

Comet's Christie suspension, with vertical coil springs, was replaced by Horstmann suspension with three horizontally sprung, externally mounted two-wheel bogies on each side. This design did not have an improved ride over the Christie suspension, however, the improved maintenance and increased area inside the hull was worth it. The driveline consisted of the Rolls-Royce Meteor engine that was used in the Comet and Cromwell was reused with a few improvements.

The design model was reviewed in May 1944, with 20 pilot models being ordered with various armament combinations. Ten were armed with a 17-pdr and the 20mm Polsten, five with a 17-pdr and a coax BESA, and five with the QF 77mm High Velocity gun with a single BESA in the hull. Prototypes of the original 40-ton design, designated as the Centurion Mk. I had 76mm of armour on the front glacis plate and 152mm of armour on the front of the turret. The prototypes showed much promise, capable of outperforming the Comet's with ease in most tests.

Soon after these tests concluded, the up-armoured Centurion Mk. II arrived, boasting a new 118mm thick frontal glacis, and up-armoured side and rear armour, going from 38mm to 51mm.

By this time, Royal Ordnance also finished work on the QF 20-pdr gun, and with it, the usefulness of the coaxial 20mm Polsten was called into question, so it was replaced quite quickly with the BESA and the turret was upgraded to an entirely cast design. This new variant was designated as Centurion Mk. III, and also featured a fully automatic stabilisation system for the main gun, allowing it to fire accurately while moving. Improvements to the engine and gunsight also further improved the Mk. III.

Production of the Mk. III began in 1948, and was so effective that the earlier Mk. I's and II's were removed from service completely as the new Mk. III's arrived. These older Marks were then turned into ARV's and other support variants.

A total of 100 Mk. I Centurions were produced between 1945 and 1946 before the Mk. II replaced it on the production lines. And for the Mk. III, a total of 2,800 were produced between 1948 and 1956 before it was replaced by the Mk. V in 1955.

The stock configuration in-game is the Mk. I Centurion, while the upgraded version is the Mk. III Centurion.

A picture of the Mk I

A picture of the Mk III

Centurion 7/1

An upgraded version of the Centurion developed by Leyland. It featured a larger hull, larger fuel tanks and better armour than previous versions. It should be noted that Centurion 7/1 historically had the 20-pdr and the armour upgrades, but the 7/2 had the 105mm gun but not the armour upgrades. These modifications were combined as the Mk 9, which is what the vehicle in its top configuration represents.

A picture of the tank

Centurion AX

The Centurion AX is a fictional name, it is officially called “Centurion Mantletless Turret”, and this originates from a book published in the early 2000s where the author cited seeing the name written on the back of a photo of the turret. This came from the 1980s and does not appear in official documents.

The origins for this tank come from the development of the Chieftain in the 1960s, the Centurion was considered an export success, it was hoped the Chieftain would be the same, but it was very expensive, thus a modification for the Centurion was created, mimicking the turret of the Chieftain, this was created as a method for poorer countries to upgrade their Centurion fleets if they could not afford the Chieftain.

The gun mount was intended to either carry the 20-pdr or L7 105mm gun, the loader was on the left, and the gunner was seated in the front right, the commander was behind him on the right corner. The cupola for this tank was allegedly up to the end-user, for trials it had a “clam-shell” type cupola. Most armour values are unknown, however the face is around 170mm thick. A misconception is that this turret is the same as the turret on the FV4202, these are actually separate projects that share the same design philosophy.

Three turrets would be built, and two were mounted on regular Centurion chassis. The last one was used for gunnery trials. Most information on the tests has disappeared, however there are details that one of the turrets “FV267252” underwent trials in June 1960 and was subjected to fire from small arms as well as 6, 17 and 20-pdr rounds. This is the only turret that survives, one turret has disappeared, and the other was destroyed in firing trials.

A picture of the tank

Another picture

The turret today

Challenger

The story of the Cruiser Mk. VIII Challenger starts with a man named William Arthur “Roy” Robotham, a former Rolls-Royce executive who became a pivotal figure despite having no previous tank design experience. With the onset of World War II, Robotham transitioned from his role in the automotive industry to lead a team in developing armoured vehicle power plants at Rolls-Royce.

Drawing on the success of the Merlin aircraft engine, his team designed and built the Rolls-Royce Meteor, a robust and powerful engine deployed first on the A27M Cromwell. This achievement earned him influence with the Ministry of Supply and the Tank Board very rapidly, setting the stage for his involvement in the development of the Challenger tank.

Development started in 1942, where the General Staff issued specification A29, calling for a 45-ton cruiser tank armed with the new 17-pdr gun. Insights from the North African campaign highlighted the need for improved firepower and reliability to counter advanced German armour.

However, the weight proposed presented massive logistical and maintenance challenges, leading to the revised Specification A30 for a lighter, 35-ton design. With this, the General Staff contacted Birmingham Railway Carriage and Wagon Company (BRC&W) to develop the A30, using the Cromwell chassis as a basis to expedite production with a few notable changes, including a modified turret ring to support a wider turret, and modified suspension for the increased weight. They also contacted Stothert & Pitt to develop the housing and turret, pivotal in mounting the 17-pdr.

The first prototype was completed in August 1942 under Robotham's direction. However it faced significant issues and immediately underwent extensive reworking. A second revised prototype was quickly finished by January 1943, however, again, when it was tested the conclusion was still problematic.

At the same time, a committee was evaluating the feasibility of adapting the 17-pdr to existing designs. Ultimately, limitations in the Cromwell's turret ring led to the Challenger being pressed forward as an interim solution until the A34 Comet could enter production.

Production delays meant that only a few Challengers were available by D-Day, with most seeing action after July 1944. The main restraint being limitations in less common resources necessary for tank production. With the interim solution being the Sherman Firefly. This led to the premature termination of the Challenger production run in November 1943, with 197 units being built.

The Challenger was deployed primarily as a reconnaissance unit alongside Cromwells, ensuring compatibility. The Guards Armoured Division and 11th Armoured Division were the first to receive the Challengers. Initially they were unpopular, due to the tall turret and mechanical reliability problems, however, the Challenger gradually grew in popularity due to the ability to effectively engage any German tank fielded. And its lower profile compared to that of the Firefly, combined with superior mobility and maneuverability earned it much respect among its crews.

In essence, the Challenger is an elongated version of the Cromwell's chassis. Stretched to accommodate the heavier turret and 17-pdr gun by adding an extra pair of road wheels. Despite its increased length, it retained many of the Cromwell's design features, including the Christie suspension system and the rear mounted Meteor engine, which provided more than enough power, with a respectable 18.8 hp/t power-to-weight. Allowing a top speed of close to 32 mph.

The Armour protection of the Challenger was comparable to that of the Cromwell too, with a sloped, two part glacis and flat frontal armour up to 102mm thick, which was also supplemented by 25mm appliqué plates added later in production.

The turret was much larger, taller, and more lightly armoured than the Cromwell, specifically to mount the 17-pdr. Having 63mm of armour thickness frontally, with the sides and rear having

40mm. For the turret ring to handle the added weight of the turret, part of it rested on a ball mount with semi-automatic jacks to prevent hamming during operation.

The upgraded Challenger in-game also uses the turret from the Avenger Tank Destroyer, which was a similar concept however using the A34 Comet's chassis as a basis. This turret was never historically fitted to the Challenger.

A30 Cruiser Mk. VIII Challenger

Charioteer

The FV 4101 Charioteer was conceived as an interim solution during the Cold War, using surplus Cromwell hulls upgraded to a common Cromwell VII standard. These hulls were modified with extensions welded to the upper sides, allowing for a larger turret ring to mount the powerful 20-pdr gun.

Initially designated as 'Cromwell Heavy AT' during its development, the FV 4101 eventually became known as the 'Tank, Medium Gun, Charioteer' so as to not confuse it with any other Cromwell in service at the time.

A new two-man turret was also developed, replacing the Cromwell's original turret. While a three-man turret was preferable, the sheer size of the 20-pdr gun made this endeavour impossible to accomplish on the Cromwell's hull. Even with all the modifications to the hull, the turret still needed to be taller to accommodate the 20-pdr's recoil.

Despite this adjustment, the Charioteer was still capable of depressing the gun by 12 degrees, enabling it to effectively engage targets in hull-down positions. Combined with a relatively narrow turret face, the design offered a very low profile, which increased its survivability.

The Charioteer's main armament was complemented by a coaxial .30 calibre machine gun operated by the loader. This allowed for effective engagement of Infantry or ranging of the main gun.

To accommodate the larger ammunition size, the bow machine gun position was removed, this was a similar modification to that of the Sherman Firefly. This adjustment allowed the Charioteer to carry 25 rounds, with its primary round being APDS. The APDS round was capable of penetrating upwards of 266mm of RHS at 900m, which ensured the Charioteer was effective in dealing with heavily armoured targets.

The power plant used for the Charioteer was the same as the Cromwell, it used the well-known 27 litre V12 Meteor engine, this gave the tank a top speed of around 32 mph despite the massive gun.

Production of the Charioteer was undertaken by Robinson & Kershaw in Manchester, a company with experience with modifying the Churchill tanks. Here, the Cromwell tanks were retrofitted with new turrets designed to mount the 20-pdr Type A gun.

Later, a slightly modified version of the 20-pdr, designated the Type B, was fitted to the

Charioteer during its production run. With that, two models were produced. One designated Charioteer Model A, which mounted the 20-pdr Type A, and the Charioteer Model B, which mounted the improved 20-pdr Type B.

An initial order of 630 vehicles was placed in 1951, however, only 442 were converted during its production run. Most of which entered service in 1952.

During the Cold War, the Charioteer was evaluated alongside the Centurion, Conway, and Conqueror. While it demonstrated similar effectiveness to the Centurion against medium targets such as the T-34-85, it lacked the protection needed to contend with heavier vehicles like the IS-3.

The lighter armour and higher mobility of the Charioteer made it suitable for rapid deployment, but these alone were insufficient against the Centurion's advantages. As a result, the Charioteer was relegated to an interim role, eventually being assigned to the Territorial Army and later sold to allied nations such as Finland. The Charioteer did see combat however, mainly under the Lebanese Army's banner.

In 1969, a single Charioteer in the UK was trialed with the Royal Ordnance L7 105mm gun for export, but no buyers emerged. Several Charioteers remain today, notably in Austria, UK, and others strung around Europe and the Middle East.

FV 4101 Charioteer

FV 4101 Charioteer with Royal Ordnance L7 Gun

Churchill I

The A22 Infantry Tank Mk. VI, more commonly known as the Churchill Heavy Tank, evolved from the pre war British tank design meant to replace the Matilda Mk. II and Valentine tanks. The A20 was conceived as a slow, heavily protected vehicle designed for trench warfare. This design included long tracks for crossing trenches and ditches, and its primary armament was intended to engage fortifications using a high calibre, low velocity gun.

The early prototypes of the A20 featured a WWI style layout, including side-mounted sponson guns, but these were eventually replaced with a turreted design similar to the Matilda Mk. II, which proved more practical.

However, the A20 struggled with its 43-ton weight and underpowered 300 hp engine. In response to this, Vauxhall Motors reworked the design, which became the A22. This redesign included a much more powerful Flat-12 Bedford engine nicknamed 'twin six', and a lighter overall structure.

With the onset of WWII, particularly with lessons learned from the battle of France, underscored the obsolescence of the A20's trench warfare focus. Dr. H.E. Merritt spearheaded the redesign effort, and by December 1940, Vauxhall delivered two A22 prototypes with production commencing soon after trials in June 1941.

The Churchill was a stark departure from the nimble cruiser tanks of the era such as the Covenanter. Instead, it emphasised protection and off-road capability. It's suspension system was specifically designed for difficult terrain and featured multiple small road wheels supported by coil springs.

The tracks extended significantly beyond the hull, enhancing its ability to traverse obstacles such as tank ditches and trenches. Earlier versions left the tracks exposed, however later versions remedied this by adding protective catwalks and mudguards. The tanks unique shape and engineering prioritised survivability in harsh conditions, including cratered and muddy terrain.

Another innovative aspect of the design was its powertrain. The Bedford Flat-12 producing 350 hp, featured a compact design and high torque, enabling the tank to maneuver its substantial weight. Paired to this, was a Merritt-Brown gearbox which included a regenerative steering system, allowing for precise movements and even neutral turns. This unconventional setup posed challenges during driver training but ultimately provided superior control for such a heavy design.

The armour on the Churchill was among the thickest of any tank during WWII, reaching upwards of 152mm on later variants. Even the early variants, which mounted 2-pdr main guns and a 3-inch howitzer in the hull, were well protected for their time.

As the war progressed, the Churchill received significant upgrades. The Mk. III introduced a welded turret and an upgraded 6-pdr gun, offering improved anti-tank capabilities. This upgrade proved instrumental in battles such as El Alamein, where the Churchill proved critical in its outcome.
Later in the war, innovative field modifications addressed the Churchills limitations. One notable adaptation involved salvaging the 75mm gun from destroyed Sherman tanks, and fitting them to the Churchill's turret. Providing more anti-tank capabilities against German Armour.

The Churchill also saw numerous specialized variants, from engineering tanks to flamethrowers. Its versatility, combined with its rugged design, made it a reliable workhorse on the battlefield. Despite initial production challenges and teething problems, the Chuchill ultimately became one of Britain's most iconic tanks of WWII.

The Churchill Mk. I was produced in 1941, with 303 built. This series was characterized by an early rounded turret, with the small QF 2-pdr gun. Plagued by teething problems, these were generally relegated to training or converted to special genie versions.

For the Churchill Mk. II, or Mk Ia, the Hull howitzer was replaced by a BESA machine gun, in order to gain extra space and simplify production. The Mk. II was produced until 1942 with 1,127 delivered. Many of the problems seen on the Mk. I had been overcome with this design by 1943, however many improvements were seen.

The first major set of modifications were completed with the Churchill Mk. III. For the first time, the turret was welded, and housed the upgraded 6-pdr and a coaxial BESA machine gun, the hull mounted BESA was also kept. Many changes to the engine, transmission, and armour protection were made, including the "catwalk" above the upper tracks. 675 of these were

delivered in 1942.

In terms of the game, there are no reports of the Churchill I hulls mounting the Churchill III's turret. The 6-pdr gun as stated came with the Mk. III variants. The Churchill Mk. IV had the upgraded Mk V 6-pdr gun, and there is no evidence of the gun being mounted on either a Churchill III or Churchill I. This is the same for the 75mm Mk. V, which was only mounted to the Mk. VII Churchill's and above. And Finally, there is no evidence that the 75mm Vickers HV gun was considered for the Churchill.

A22 Infantry Tank Mk. IV Churchill Mk. I

A22 Infantry Tank Mk. IV Churchill Mk. II (Ia)

A22 Infantry Tank Mk. IV Churchill Mk. III

Churchill VII

For more information on the Churchill tanks as a whole, go to the Churchill I above.

The Mk. VII Churchill, commonly known as the 'Heavy Churchill' gave us the last evolution in the turret design for the Churchill tanks. The hexagonal and angular turret was partly cast and welded, asymmetric, and lengthened at the rear to house a bigger 75mm gun.

The internal mantlet was holding together, in a narrow configuration, the main gun, the coaxial BESA machine gun, and the gunners optics. Two deflector bulges were welded on each side of this opening to deflect incoming rounds from sensitive angles.

With this new and improved Churchill, many of the old variants were quickly retrofitted to the Mk. VII standard, and most were given separate designations. The Churchill Mk. IX was basically either a Mk. III or Mk. IV retrofitted with the Mk. VII's turret, engine and suspension. The Mk. X, which was a Mk. VI Churchill upgraded to the Mk. VII standard. And the Mark XI, which was the Mk. V Churchill upgraded to the Mk. VII standard, and also received extra armour.

The main improvement other than firepower, was the armour itself. With the frontal armour being increased to 152mm. This variant specifically was redesignated as the Ordnance A42 in 1945. Production ended in 1944 with around 1,400 built.

Historically, the Churchill Mk. VII mounted the QF 17-pdr gun, not the 75mm Vickers HV. The Churchill Mk. VII was also the basis for the Churchill Crocodile.

A42 Infantry Tank Mk. IV Churchill Mk. VII

Comet

With the A43 Centurion still under development and not expected to be ready until 1945, the British Army sought an interim solution. The answer was the A34 Cruiser Tank, Comet, which is

designed to be faster and more maneuverable than the Churchills, while being capable of engaging heavier targets such as the German Panther or Tiger tanks.

Design work on the A34 began in May 1943, led by the Birmingham Railway Carriage and Wagon Company, which had also been responsible for the Cromwell tank. A plethora of other companies also contributed to the construction of the Comet, including English Electric, Fowlers, Leyland, and Metropolitan-Cammell.

The Comet's hull shared many similarities with the Cromwell, reflecting the designers' decision to avoid complicating production. This continuity meant that fully sloped armour, which would have improved protection against enemy rounds, was not adopted.

The tank featured an enlarged turret ring of 64 inches to accommodate its wider turret. The hull was constructed using welded armour rather than a single cast piece, this reduced production time and weight while eliminating the risks posed by rivets by non-penetrating hits. Traverse was provided by the engine, with hand wheels for fine tuning.

The Comet employed Christie suspension, renowned for providing a smooth ride with the downside of consuming valuable space within the fighting compartment. The tank also featured wider tracks to decrease ground pressure added by the increased weight of the turret, this also improved agility and speed on and off road.

The Comet's turret was made from welded RHA which gave the tank a substantial 102mm of frontal protection. Mounted on the turret was the new 77mm High Velocity (HV) gun, which was a modified version of the QF 17-pdr which was redesigned by Vickers-Armstrong to fit the Comet's turret. This gun offered slightly less firepower with the added benefit of greater accuracy at further distances.
The gun was capable of firing an assortment of rounds, including APCBC and APDS which significantly enhanced its ability to penetrate armour. Despite its power, only 61 rounds were able to be stored within the tank due to the Christie suspension.

Production delays meant that the Comet only saw limited combat during World War II. The first units were delivered to North-Western Europe in late 1944, but they weren't used during the Battle of the Bulge. Instead, British forces relied on the Cromwell's, Sherman's, and the Achilles tanks during the pivotal battle.

To mitigate risks posed by German bombing runs at the time, production was dispersed across Britain. While an initial order for 3,000 units was issued, the end of World War II curtailed production, with only 1,186 Comet tanks being produced. With a remarkable number of only 26 being lost during combat.

The A34 Comet exemplified British ingenuity in tank design during World War II. While it was only a stop-gap solution, its blend of speed, firepower, and reliability ensured it remained a respected vehicle long after its frontline service ended in 1945. Many Comet's were also sold off to Allied nations by the late 1950's.

In terms of the game, the Comet was never historically fitted with a Cromwell turret, and only featured the 77mm HV gun, none of the others.

A34 Cruiser Tank, Comet

Concept 5

Developed as part of a comparative design study of a tank with a possible wheeled layout, there were 6 concepts in this series, including a concept for a 3 man Challenger I. The identified pros of such a vehicle was that it was cheaper to make, lighter and also faster, whereas it lacked armour and cross country capabilities. The gun of this tank is unlikely to be a 110mm gun, since the British didn't want a large gun on this tank, I personally would expect no larger than a 105mm gun. Since this was only a design study, it didn't go beyond the paper.

A picture of the design

Conqueror

On September 7th, 1945, military heads of the Western Powers were horrified by what they saw rumbling towards them along the Charlottenburger Chaussee in central Berlin during the 1945 Victory parade celebrating the end of World War II.

During which, the increasingly threatening Soviet Union unveiled its latest heavy tank to the world. The IS-3. As they clattered down the parade route, a sense of fear enveloped the representatives of the British, US, and French Armies. In their eyes, they saw a tank with a well-sloped, well armoured pike nose, wide tracks, and a gun of at least 120mm in calibre. The race was on, and they began working immediately on their own heavy or heavily armed tanks. This led to the Americans creating the 120mm Gun Tank M103, while the French experimented with the AMX-50. Both mounted a gun that was specifically designed to deal with the IS-3. On the other hand, the British pursued a different route. They started development of a "Universal Tank", what we know today as the Main Battle Tank.

The FV4007 Centurion was also in development before the IS-3 appeared. At this time however, it was only equipped with the 17-pdr, and was projected to be equipped with the 20-pdr in the future, but they needed a more powerful gun.

This is where the FV200 series comes in. The FV214 was one of the vehicles within this series, and was a design for a "Heavy Gun Tank", which would become known as the 'Conqueror'. The officially designated 'Tank, Heavy No. 1, 120mm Gun, FV214 Conqueror', was an impressive vehicle.

In June 1949, an official requirement for this tank was made with designers working on the tank very quickly realising they had a few problems. They didn't have a gun, let alone a turret or hull.

The requirements called for the new heavily armed tank to be armed with a large calibre gun. The first contender was the 4.5 in (114mm) gun which was first considered for the FV205 in 1946 was explored before moving to a 120mm gun.

The main problem with this, was that there was no 120mm gun being developed at the time. But, the US was developing their T43/M103 120mm Gun Tank Project, which had very impressive range and penetration. With the US and UK working so closely together, the UK decided to work on developing a 120mm gun with a 22-ton chamber pressure. Efforts were even made to standardise the guns between each other. The gun was officially designated the Ordnance QF 120mm Tank L1A1 Gun.

Weighing 2.9 tonnes by itself, with a length of 7.4m, the 120mm L1 gun was monstrous. Unfortunately, the Centurion turret was completely incapable of holding such a gun, so a new one was to be developed from the ground up. This undertaking was given to the Royal Ordnance Factory in Barnbow in 1949. Another issue was finding a suitable chassis that was strong enough to carry the gun, the designers decided to attempt to use the nearly completed FV201 hull.

By 1950, with the gun and turret still well in the development stage, it was clear that prototype production and trials were a long way off. The Hull and chassis however, were in the final stages of development. The chassis used was a simplified version of the FV201 series. With the hull being slightly shorter, and having a thicker frontal glacis plate which was sloped further.

With the Hull completed, the Tank, Medium Gun, FV221 Caernarvon project was launched. The aim of this project was to speed up the development of the Conqueror, while giving crews operational experience with the Hull. The tank had a Centurion Turret mounted with an initial prototype being built in April 1952.

Earlier in 1950, another stop-gap started development. The adoption of a 120mm gun was seen as an urgent requirement, and a plan was formulated to develop this heavy tank that would be equipped in armoured units until the FV214 was ready.

This project became the FV4004 Conway. This was based on the existing Centurion, with the aim being to bring the 120mm gun into the field as soon as possible while not interfering with Centurion production.

As such, a new turret was tall and box-like, featuring a fully welded construction to not interfere with standard Centurion turret castings. The 120mm gun was mounted high and to the rear, this limited traverse to just -5 and +10 degrees. Despite looking visually larger, the turret was only 25cm taller than the Centurion.

Only two turrets were built for fire-from and fire-at tests, while the weighted hull was used for mobility testing. While it performed well, by the time it was ready to go into production, the FV214 Conqueror was now entering production making the tank useless.

By 1951, work on the FV214 had progressed to the point where firing trials of the Ordnance L1 120mm gun had concluded with the weapon being accepted into service. As well as the aforementioned FV221 and FV4004, there was also an idea to mount the gun to a casemate style tank destroyer on the FV200 chassis which was designated the FV217.

The turret was finalized with a number of innovative features, such as an automatic rammer for assisting the loader, a shell ejection system, and a ‘Fire Control Turret’ for the Commander.

By 1952, four pre-production turrets and 3 guns were available to start trials. These were mated to the existing FV221 hulls where 4 prototypes were assembled. These vehicles took part in mobility and endurance trials conducted by the Fighting Vehicles Research and Development Establishment between September 1952 and July 1953. Together, the vehicles covered roughly 7.911 miles at speeds of up to 15 mph cross country. As it performed well, 5 more pre-production vehicles were ordered for further testing.

Troop trials commenced in 1953, with 20 vehicles being ordered and built at the Royal Ordnance Factory in Dalimur, Scotland. Construction of these was completed in Summer 1955.

While the trial versions were in production, certain details of the vehicle were adapted based on test results of the first batch. This resulted in two marks of the FV214. Vehicles produced before the alterations became the FV214 Conqueror Mk. I and the vehicles built with modifications became the Mk. II.

The most notable differences between the Mk. I and Mk. II are the exhausts, fume extractor, and drivers periscopes. On the Mk. I, the exhausts were equipped with mufflers whereas the Mk. II features straight-through pipes. The Mk. II's fume extractor was bigger to improve its efficiency.

The Hull of the FV214 Conqueror was constructed of an all-welded design using plates of RHA steel with the front glacis plate being upwards of 130mm thick sloped at 61.5 degrees. The rear plates and hull floor were 20mm thick, with the roof and sides being 51mm thick.

Designers thought that the 51mm side armour with added plates was capable of countering the IS-3's 122mm main gun. But this has never been verified. However, the Soviet 100mm UBR-412B APHE rounds fired at the Centurion in combat was stopped, this was seen as justification.

The Conqueror used the Rolls-Royce Meteor M120 Mk. 1A, which had around 810 hp at 2,800 rpm mated to a 7-speed Z52 transmission, this gave the FV214 a top speed of 21 mph on road. Unfortunately, this was quite underpowered for the size and weight of the vehicle, this caused reliability issues with the powertrain due to overloading.

The suspension used on the Conqueror was the Horstmann system, used previously on the FV201 and Centurion. This system consisted of three horizontal springs mounted concentrically, guided by an internal rod and tube. This allowed each wheel to rise and fall independently, although the system did struggle if both wheels rose at the same time. Four bogies line each side of the hull, with four return rollers.

The turret was made of a single steel casting. It had an odd shape, with a curved face and a long bustle. The turret face was at its thickest, 340mm, which was also angled at around 60 degrees, giving it an effective armour value of upwards of 680mm. The side cast of the turret was around 89mm thick, with the roof having slightly thinner armour at around 51mm.

The Conqueror entered service in 1955, with it being produced until 1958. Its role was to support allies, rather than be a lone wolf. It was designed to cover lighter armoured advances from a far distance.

The Majority of FV214's went straight to West Germany, with a small number being retained in the UK. Right from the start, it was clear that the sheer size of the Conqueror was going to cause problems. It was too heavy to transport via European gauge railways, so it had to be loaded onto the back of Antar tank transporters, changing a two hour trip into a twelve and a half hour trip.

This was mostly due to the combined weight of the transporter and the tank, adding up to around 122 tonnes, which meant that every time they came across a bridge, they had to dismount the tank and drive it across separately.

1958 almost saw the end of the Conqueror, when 5 tanks engines failed in quick succession. Thankfully, these issues were not caused by the tank itself, and were quickly fixed.

Mobility-wise, the tank performed better than expected, with the Conqueror being able to keep up with the Centurion despite being 15 tonnes heavier. However, it was still plagued by mechanical failures due to the underpowered engine.

With constant breakdowns and recurring fuel leaks often keeping the tank off the front lines, the effectiveness of the tank was taken into question. And due to the sheer size and weight of the tank, every time they came across a country bridge, they would have to delay due to diverting the Conquerors around said bridges.

And with all that, in 1959, the Conqueror's fate was sealed, that year, Royal Ordnance had begun the final tests of the famous 105mm L7 gun. The ballistic performance was found to be similar to that of the 120mm L1, this was also lighter and capable of being mounted to the Centurion. This made the Conqueror obsolete overnight.

However, it stayed in service till 1966, which was the final nail in the coffin, with the FV4201 Chieftain arriving. This tank was leaps and bounds above the Conqueror technologically, and had a new and even more powerful 120mm L11 gun. All Conquerors were retired with 180 being built by the end of production.

FV214 Heavy Gun Tank Conqueror

Armour Layout of the FV214

FV214 Blueprints

FV214 Original Turret Sketch (From 1950)

Conqueror GC

A rather well-known fake tank, it seems to have been inspired by the FV3805 - that being on the hull of a Centurion, and this being on the hull of a Conqueror. The tank's claim to history is even more dubious when considering the gun.

“Just over 500 BL 9.2-inch Howitzers were produced. While there is no question that it was a very powerful weapon, the howitzer would’ve been completely obsolete in the early Cold War era that the vehicle is set in. On top of this, the weapon was officially retired from service during the Second World War and was replaced by much more accurate and advanced weaponry”.

In conclusion, the hull and gun existed, but it’s highly unlikely they were ever considered to be put together. If there had been a need to arm a Conqueror with a gun like this, it’s highly likely the designers would not turn to an almost-antique weapon to arm it with.

A comparison between the FV3805 and the Conqueror GC

Gun schematics

A picture of the gun

Conway

Developed in the early 1950s whilst the FV214 project was in development as the British command grew concerned that a war would be imminent with the USSR. If this happened, there was a fear they would have no tank field-ready that was capable of taking on the IS-3. By Autumn 1950, a program was devised by the war office to take existing hulls, and fitting them with more powerful guns, this evolved into the 20-pdr being in the FV4101 Charioteer, whilst the 120mm would become the Centurion based FV4004 Conway. And a 180mm gun project would become the FV4005.

It was proposed by the FVRDE that the newly developed 120mm L1 Heavy gun intended for the FV214 could be placed on the Centurion hull, this design would be designated Centurion 120mm at the time, and was considered the Stop-Gap Heavy Gun Tank that would be in service until the FV214.

The hull for this vehicle would be the Mk III Centurion, with minimal alterations other than hull ammunition stowage and some cosmetic changes. The turret was required to be new, since having the gun in the turret would move the centre of gravity forward and it would put excessive wear on the forward suspension units. To combat this the gun was raised to allow the turret to rotate properly as well.

This new turret, whilst seeming tall, did not drastically increase the vertical profile of the vehicle, the Centurion was originally 2.9m tall, while the Conway was 3.2m tall. The weight of the vehicle did not change much either, being 50 tons.

There were a few trials of this tank, the turret would be tested with leftover 8.8cm KwK 36 L/56 guns from the Tiger I, whilst also being subjected to fire from the 6-pdr and 17-pdr guns. It was found that the Conway’s turret was able to withstand penetration from 17-pdr ammunition, but it would still have internal spalling. The mantlet was impervious to anything tested against the turret.

Production of the Conway was planned to start in early 1952, and by April 1953 it was expected that at least 50 FV4004s would be ready to enter service. Ultimately though, the project ended

without the vehicle ever seeing service, the war with the Soviet Union also never happened. The FV214 Conqueror would enter service in 1955, terminating the need for this vehicle. Only two would be built in almost complete state, but only one now survives.

A picture of the blueprints

A picture of the mockup

A picture of the prototype

Covenanter

Developed in the late 1930s after it was realised that the Cruiser Mk IV was unable to radically improve the effectiveness of its predecessor, the Covenanter was a “heavy cruiser” tank, a concept which had been written up in 1936 after observing the Soviet T-28 alongside BT tanks. This would result in the A14 and A16 tanks developed by Nuffield and LMS, but these would be rejected.

The heavy cruiser tank concept would be revisited on February 2nd 1939, the original specifications were for a maximum armour thickness of 40mm, Christie suspension, 2-pdr gun and the combat weight was to be the same as the A13 Cruiser tanks (Mk III and Mk IV). This project would become known as the A13 Mk III, which was ready in mid-April 1939. Instead of an extensive modernization, LMS created a new tank which only inherited the same suspension type.

The hull of this vehicle was very low profile due to its suspension being installed at an angle, and using a Meadows 12 cylinder 300hp engine using an opposed cylinder layout. Unfortunately in reducing the size of the engine compartment and making the tank shorter, there was no other option than to put the radiators on the front of the hull, these were placed on the front left, with the driver being seated on the right.

The turret of this vehicle would be developed by Nuffield, which was extremely sloped to increase effectiveness, despite the front of it being at a right angle. The cupola of this vehicle was omitted in favour of just using a periscope, this was installed in the middle of the turret right above the gun breech, this must’ve been uncomfortable for the commander, who could’ve ended up with a gun breech in his chin…

On April 17th 1939 LMS received an order to build 100 tanks, and no prototypes would be built, the tank was to enter production immediately, this said a pilot tank would be built. During tests with the pilot, the tank was noted to be extremely unreliable, and consistently overheating, as well as the lifespan of the tracks being extremely poor.

In total 1771 tanks would be built by early 1943 including 20 Covenanter Mk I’s and 60 Covenanter Mk IVs. Despite the numbers, these tanks would never see combat, and would be used as training tanks, and not just for the British army, these tanks also served with the Polish until 1944. Only one Covenanter still exists, being a Covenanter Mk III produced in late 1941.

A picture of the pilot

Covenanter Mk I's

Later Covenanters

Cromwell

The basic design for the Cromwell emerged from an under-used Rolls Royce design team led by W. A. 'Roy' Robotham. This team would normally be working on designs for new Rolls-Royce cars, but the company had ceased production at the start of the war, and were entirely focused on the Merlin aircraft engine. Robotham and his team then took over the Clan Foundry near Belper and began to look around for suitable war work.

In October 1940, Robotham met with Henry Spurrier, the general manager of Leyland Motors. The two men discussed the problems with British tank designs. After this meeting, Robotham and his team began to examine the possibility of fitting a Rolls-Royce engine to a cruiser tank. After testing a variety of Rolls-Royce engines they settled on ther Merlin Mk. III and produced an unsupercharged version.

This engine was then installed into a Crusader tank and sent to Aldershot for trials on April 6, 1941, three months after the A24 had been ordered. The Meteor powered Crusader excelled in trials, going so fast the time-keepers failed to time it properly. It was estimated that the tank reached upwards of 50 mph.

The new Meteor engine was clearly a major step up from the Liberty, and they were soon given a contract to build 1,000 of them. Due to Leyland pulling out of this deal, Robotham worked with the Birmingham Railway Carriage and Wagon Company to design a tank for this new engine.

This led to the designation of A27 being adopted, however instead of focusing entirely on the Meteor, they chose to create a design using the already proven and reliable Liberty engine. This became the A27L Centaur. While the A27M Cromwell would become the official designation for Robotham's Meteor engine.

By January 20, 1942. The first prototype of the A27M Cromwell was running two months ahead of the A24. And in the same month, production of the A24 was scaled back. At this time, there was skepticism that there would be enough supply of Meteor engines, so, it was decided that the A27 design be made so it could take either the Liberty or the Meteor. However, BRC&W soon proved incapable of being able to cope with the demanding task and the A27M was moved to Leyland, who now is working on both projects.

The A27M's appearance is similar to that of the A24 and earlier Crusader. It had a low flat rectangular hull with a stepped front to allow for a hull machine gun. All of its sides were flat, to aid in producing the tank. The Cromwell had a welded superstructure with appliqué armour riveted from the inside of the tank.

In August 1943, the Cromwell had its first serious test, Exercise Dracula, a gruelling 2,300 mile trip around Britain that was intended to compare the A27M Cromwell, the A27L Centaur, The M4A2 Sherman and M4A4 Sherman tanks.

The Sherman came out as the most reliable, both on the move and in gunnery exercises. The Centaur was a complete failure. However, the Cromwell did better, but it still needed far more maintenance on the road than the Sherman. As a result of the trials, the Centaur was effectively dropped, with the Cromwell given more time to improve. A second longer test was conducted in November the same year, which showed the Cromwell was becoming increasingly more reliable, with the Centaur still being a complete failure.

On February 2nd, 1944, with the D-Day landings approaching fast, Leyland issued a specification for the Battle Cromwell. Setting out a list of features that any individual tank would have before it was considered combat ready.

These ‘Battle Cromwell’s’ had correct versions of the Meteor engine with a Merritt Brown transmission. They also added 6mm of extra armour under the crew compartment to protect against anti-tank mines. The riveted plates and joints were seam welded to make them stronger and more waterproof.

The Cromwell Mk. I and Mk. III’s were removed, since the 6-pdr gun did not meet the specifications given. Instead, improved Cromwell Mk. IV and V tanks, which fitted a 75mm were used. With these strict conditions, it lead to the only tanks participating being of the highest quality.

The Cromwell was at its peak in North Africa, where it was able to use its superior speed and firepower to out maneuver enemy vehicles. While in Normandy, it struggled, where the urban environment, mixed with dense forest, meant it couldn't use its speed and mobility. But after the allies broke out of Normandy, the reliability and speed allowed it to move in tandem with the fastest moving elements in the Army.

The tank however was not invincible, with it being vulnerable to mines, even with the added armour, and the 75mm gun was still not powerful enough to engage German Panther and Tiger variants frontally at any range.

The tank was eventually replaced by the Comet in 1945, and between 1943 and the end of its production in 1945, between 2,494 and 2,607 Cromwell’s of all variants were produced. With an estimated 350 mounting the 6-pdr, and 1,800 mounting the 75mm.

The Cromwell in-game is a mix of a few variants, mainly the Cromwell Mk. I and Mk. III. Historically, the Mk. I and III only mounted the 6-pdr gun. The 75mm Mk. V gun was only seen with the Cromwell Mk. IV and onwards. The 3.7 inch Howitzer was mounted to the Cromwell Mk. VI or Cromwell CS. The only gun that was not historically mounted to the Cromwell was the 75mm HV gun, this was due to the turret being too small to house the breech.

A27M Cromwell Mk. I
A27M Cromwell Mk. IV

Cruiser I

In the late 1920's, tank development in Britain was flagging significantly due to a number of conservative officers in the Royal Tank Corps and a slew of failures in state designs. The only vehicles to enter production during the entire decade were the Vickers Medium Mk. I and II tanks.

In 1934 and 1935, the British War Office began incrementally receiving increased funding and taking future thinking more seriously, not least due to the League of Nations failure and rearmament of Germany.

After a number of large exercises, including the testing of the Experimental Mechanised Force, and lengthy consultation. The War Office published details of the roles they envisioned tanks would play in the future, and therefore, the tanks they required.

Specifically the War Office asked for three types of vehicles, a light reconnaissance tank, which would become the Vickers Light models. The slow 'Infantry' tanks intended for use as breakthrough heavies, which led to the Matilda I and II. And the 'Cruiser' tanks for flanking and exploiting open ground.
These Cruiser tanks were designed to be fast and well-armed to fight enemy tanks. In particular, the directorate of mechanisation and Percy Hobart, the inspector of the Royal Tank Corps, requested at least a three-man turret, and the 3-pdr gun. Other elements limiting cruiser tanks included the British railways gauge, which was the preferred mode of transport for tanks, and the weight of bridges.

Vickers-Armstrong quickly snapped up the Cruiser tank project and began adapting their most recent design for a medium. Known as the A7, because there was no place for the Medium I, II, and III tanks within this new doctrine. The hull of this new vehicle was a smaller version of the failed Vickers Medium Mk. III.

They initially drafted arguably their most talented and notorious designer Sir John Carden, to adapt and produce the prototype. But his untimely death in an aircraft accident in December 1935 cut short this endeavour.

Their new prototype, known as the A9E1 utilized a variety of commercial and readily available parts where possible. This fact, combined with the adaption of a medium tank project created a quite bizarre design, with new and old parts cobbled together.

In 1936, the initial design was submitted by Vickers. The A9 utilized a simple AEC bus engine for propulsion. A cheap and reliable way to get 150 hp and in theory, propel the tank up to 25 mph. It was also the first British tank to feature a fully hydraulic turret traverse system.

Carden's main impact had been the incorporation of his new and highly flexible 'bright idea' suspension, but this was mounted on road wheels of different sizes. This saved maintenance cost but caused a complete headache for supply and maintenance teams in the field.

Initial testing was conducted in May the same year, where the suspension was found to be poorly guided and supported by the chassis. This meant that on rough ground and in fast turns, the tracks would slew and come off the runners. Fortunately, minor tinkering fixed the problem.

The main gun was a big advancement in technology, being the excellent 2-pdr. As well as being compact, the quick-firing and accurate gun was capable of destroying any tank fielded at the time at almost 1,000 yards and would remain for the better part of the next 5 years.

To save on weight and keep the speed high, the armour protection was limited to only 14mm. This was established as the effective thickness to repel small arms and light machine guns. But beyond that, it was useless other than at very long distances. Furthermore, the armour was bolted at a time when most other nations were already welding their tanks, this would continue as a British practice well into the war.

This process increased the likelihood of the plate shearing or the bolts spalling even on non-penetrating hits. The inclusion of two secondary turrets equipped with machine guns at the front of the vehicle, seated on either side of the driver, which was a completely obsolete choice, which was a fad created by the A1E1 Independent a decade earlier.

Among other things, it was of little use in combat, it increased the crew numbers from four to six. These turrets also created a barn door sized shot trap which funneled shells right into the frontal plate at a perfect angle.

The main turret, similar to that of the A7, was manned by three people, a commander, a gunner, and a loader. This itself was reasonable, however it was a smaller turret, meaning it was quite cramped, which decreased crew efficiency and cohesion. This problem was due to the obscenely small turret ring.

Even as the A9 was accepted into production, a combination of increasing budget of the War Office for Research and Development, global instability and the flaws found in the A9's design led to its recognition as a stopgap measure, with a successor already in the works by both Vickers-Armstrong and the Nuffield Company in 1937: The A10 and A13 Cruisers respectively.

Despite its… Problems, the War Office saw that it conformed to their specifications and was presently the only vehicle to offer until more dedicated Cruiser tanks could be designed. As well as using cheap components keeping the vehicle in budget leading to a relatively large order of 125 vehicles which was placed in 1937. The first batch rolled off the assembly line in January 1939, and six months later, the up-armoured A10 Cruiser Mk. II began arriving too. Nuffield's A13 Cruiser Mk. III also began production but suffered its own problems.

The Production run ended in June 1940. And during gunnery training, the A9 was found to pitch violently at speed and be pretty hopeless when firing on the move. Happily, this design flaw helped discourage rather ineffective practice and convinced some British gunnery officers to shake the habit.

Approximately 40 vehicles were altered to mount the QF 3.7 inch howitzer. These could fire powerful HE shells capable of solving the 2-pdr's ineffectiveness against soft targets. However, with the trade off of having next to no ability to deal with enemy armour, mixed with the

insufficient velocity of the gun meant that the A9 ‘Close Support’ was vulnerable to anti-tank guns that could out range it.

In the months after the full retreat at Dunkirk, 70 A9 Cruiser tanks were shipped to North Africa alongside their sister cruisers, which were rapidly approaching obsolescence at the same rate. Their performance was similar to that in France, being ineffective on their own with the 2-pdr struggling to penetrate Pz IV tanks.

The A9 was more than capable of facing early German Panzer’s such as the Pz. I and II, early Italian tanks, and Early Pz III models, mainly thanks to its 2-pdr gun. However, its massive failure stemmed from the significant compromises in design which were required to get it into production at all. The difficult maintenance, poor protection, and lack of experience in its crews were the main issues.

Its main replacement was the Crusader, which began arriving in the deserts of North Africa in 1941. While an improvement in basically every way, thanks to the urgency created by the loss of so many vehicles in France, it was rushed into service with many of the same principle problems. In total, 125 A9 Cruiser Mk. I tanks were built before the Crusader was rushed into service.
A9 Cruiser Mk. I

Cruiser II

The Cruiser I was at its core a “cheap” medium tank, comparable to the contemporary Infantry tank the Matilda I. The A9E1 borrowed many features from the previous Medium Mk. III and parts from commercially available equipment as possible to reduce the conception costs. This helped to lower the unit price and bought a formal approval for 125 of them from the War Office, officially designated as Cruiser Mk. I, in 1937.

With a crew of 6 in a cramped space, the Mark I was covered in armaments, with the two front turrets mounting Vickers machine guns, while the main turret had a coaxial Vickers, and a QF 2-pdr. For the time, this gun had the punch required for most of the tanks fielded by the Germans.

The tradeoffs however, was an entirely riveted hull, which increased the likelihood of spalling even on non-penetrating hits, thin armour, and a unique suspension system, combining two bogies, each with four pairs of small and two pairs of larger road wheels. This was designed to give the tank a lower ground pressure and smoother ride with minimal parts. This system was an interim before the new Christie system could be adopted.

Although fast, the first Cruiser lacked protection, with just 14mm of frontal armour. The triple turret system made it complicated to build, and this feature, once in favor for the interwar, quickly became obsolete in 1940.

The A10 was studied by John Carden at the same time in 1934, following specification for a 1-inch armoured tank, while speed would be slightly lower. The A9 plans were subsequently modified into the A10.

Both were strikingly similar, by the two frontal turrets were eliminated, replaced by a lighter armoured box, armed with twin .303 machine guns. The biggest change was the armour, which was raised to 30mm on the nose and mantlet, and 14mm on the sides and rear. The underbelly and roof were unchanged, at 6mm.

The engine was also unchanged, keeping the AEC Type A179 6-cyl petrol engine from the A9. Due to the extra armour, which added around 2.3 tons, the top speed was reduced to just 16.1 mph, compared to the 25 mph top speed of the Mk. I.

The original A10 Cruiser Mk. II was armed with two Vickers .303 machine guns. They were reliable, but cumbersome and inaccurate. Due to the deletion of the extra turrets from the Mk. I, the Mk. II could carry more ammunition for these guns. Later, the BESA machine guns were adopted on the Cruiser Mk. II. They were lighter, more compact, and more accurate. This helped to distinguish the new Cruiser tank.

The Mk. II, like the Mk. I, failed to become a successful British tank design, with its shortcomings being rooted in a series of cost-saving measures and peacetime compromises. To distinguish the Mk. II from the Mk. I, the classification as a ‘Heavy Cruiser’ was given due to its greater protection. However, this was certainly not enough protection to serve as an Infantry Tank.

In the upcoming Battle of France, where the first 21 delivered were committed to the 1st Armoured Division, where it performed equally poorly. This was due to the very slow speed off road and tracking problems with the overcomplicated suspension.

The tanks first real fight however, was in Greece, where 60 Mark IIA’s were sent with the 3rd RTR. Here, the QF 2-pdr was deadly against German armoured cars and light tanks such as the Pz. I and II’s. However, even this up-armoured variant was unable to sustain fire from even the lightest German Pak’s including the early Panzer III’s and the majority of those sent were lost, disabled, or abandoned by April 1941.

Reliability was also a big issue, crew safety was poor, due to the narrowness of the escape hatches, survivability was also low. The Cruiser Mk. II was an all-round failure like the Cruiser Mk. I. If not worse, where the Mk. I had some mobility, the Mk. II didn't. Between the years of its production, 1938 to September 1940, a total of 175 vehicles were manufactured.

In terms of the game, The Cruiser Mk. II was never fitted with the 40mm Pom-Pom autocannon.

A10 Cruiser Mk. II

Cruiser III

The vehicle that would serve as the basis for the new British Cruiser tank came from the well-known inventor John Walter Christie. After World War I, Christie had been involved in experimenting with a new concept for a convertible armoured vehicle. He devised a plan of using a tracked suspension system that could, if needed, be easily modified and used as a sort of wheeled vehicle by removing the tracks.

The first prototype tank to use his suspension system was presented to the US Army in early 1921, named the M1919. While the vehicle was trialed at Aberdeen Proving Ground, a number of problems were noted and for this reason, Christie spent more time modifying and improving his design, which he again presented to the US Army in 1923.

Once again, the tank was rejected due to many flaws, and once more, Christie completely redesigned his suspension system. This iteration, he incorporated four larger road wheels, with the idler in the front and the drive sprocket at the rear. The last road wheel was connected with a chain belt to the drive sprocket and was used to provide power when the track links were removed.

During 1928, Christie himself made great efforts to advertise the new vehicle, especially to the US Army, but also to customers abroad. Luckily for Christie, armies around the world were slowly expanding their forces, including their armoured vehicles.
Poland and the USSR were highly interested in Christie's design. Based on his vehicle, the Polish would go on to develop their own tank, which wouldn't get past the prototype stage due to the outbreak of World War II. However, Soviet negotiations proved more promising.

In 1930, a Soviet delegation, led by I. Khalepskiy, who was in charge of the Red Army Mechanization and Motorization Directorate (UMM), and D.F. Budniak, the Defence Industry Representative, visited a number of American weapons and arms manufacturers, including Christie's own plant. The Soviets were so impressed they ordered two vehicles. These arrived early 1931 and would serve as the foundation for the BT-series of tanks.

Years later, the British delegation would see these BT tanks at military maneuvers held by the Red Army near Kyiv during August and September 1936. This delegation included Deputy Director of Mechanisation Troops at the Ministry of War, Lt Colonel Giffard LeQuesense Martel. He was a staunch advocate for mechanising forces and was highly impressed with the Soviet BT-Series.

Martel saw the BT tank's potential and even expressed willingness to acquire one such vehicle. His wish was not fulfilled due to political reasons. Because of this, Martel went straight to Christie to discuss the potential purchase of one of his tanks.

However, lacking proper authority, Martel was worried about a potential rejection. To bypass this, he initially approached Lord Nuffied, and in dialogue managed to persuade him to reach out to Christie and explore the possibility of striking a deal.

Despite the initial agreement, delivery issues arose. The recently implemented Neutrality Act of 1935 implemented by the US Government technically prohibited Christie from selling his vehicle to the UK. Again, to mitigate this, Christie classified the vehicle as a tractor.

The tank eventually arrived at the Mechanisation Experimental Establishment (MEE) in Farnborough in November 1936, designated as A13E1 and was used for field testing. Upon its arrival, it was immediately noted that the tank lacked an air filter. After this was remedied, the tank displayed promising all-round performance, thanks to its 350 hp Liberty petrol engine, which proved more than adequate for the job.

The gearbox unit operated smoothly and without issues. However, a notable downside was its relatively weak armour protection, measuring close to 13mm thick. Additionally, the turret ring was deemed too small to accommodate even the smallest turrets built in the UK. Nevertheless, this was not a concern, the suspension was what the Uk officials were worried about.

The tank then was transferred to Morris Commercials Cars Ltd, where it underwent full disassembly and examination. At this juncture, Nuffields enthusiasm for the project skyrocketed, prompting him to insist that his firm take charge of its future development. Consequently, in September 1937, he established a new company, Nuffield Mechanization and Aero Ltd.

As preparations for constructing the initial prototype progressed, Christie arrived in the UK early in 1937 to lend his expertise to the endeavor. Assuming an advisory role, he offered suggestions for potential enhancements to the design. One such suggestion aimed at enhancing the vehicles overall performance by widening the track pitch to 254mm. However, Nuffield opposed this proposal, and opted for a narrower 127mm pitch.

A significant setback on the project was the lack of suitable engines. So, to expedite the project and simultaneously reduce costs, it was decided to repurpose an aircraft engine. Fortunately, Nuffield stumbled upon stockpiles containing over 600 stored and unused 500 hp Napier engines. While expressing interest in procuring one for testing, financial constraints and the engine's growing obsolescence posed a major hurdle. This setback was eventually overcome through the acquisition of six older Liberty-type engines and Nuffield commenced production designating these engines as the Nuffield Liberty.

With financial and production issues solved, it finally came time to commence work on a prototype. The initial vehicle, designated A13E2, was completed in October 1937. Despite bearing many similarities to Christie’s design, this new prototype introduced a series of tailored alterations to meet the requirements of the British Cruiser tank concept.

Notably, the turret ring was enlarged to accommodate a more spacious turret, necessitating the enlargement of the A13E2’s hull. While Christi’s vehicles could be driven without tracks, this feature was not well-received by the British and was abandoned. Instead, a rear-driven sprocket without teeth was employed.

Following the prototype's completion, the tank underwent testing at the MEE, where several defects were identified. The gearbox in particular, proved to be somewhat problematic and required revision. This adjustment resulted in a reduction of the top speed to 48 km/h, which was still commendable for pre-war designs.

In February 1938, another prototype, designated A13E3, was constructed. This iteration incorporated newly developed domestic tracks with smaller two-comb pitch, and the rear driver sprocket was equipped with teeth.

After approval of the tank's design, a production run of 65 vehicles was issued in January 1938, entrusted to Nuffield. However, actual production commenced either at the end of 1938, or early 1939, varying according to sources. By September 1939, 43 vehicles had been completed, with the remainder of the order being fulfilled by the end of 1939.

The A13 Mk. I Cruiser Mk. III's hull maintained a similar layout to earlier British Cruiser tanks. Essentially, it was divided into three major compartments. The drivers compartment, the fighting compartment, and the engine compartment.

The engine used in the A13 Cruiser Mk. III, was the 340hp Nuffield Liberty V12, with the tank weighing a total of 14.2 tonnes, the engine was capable of sustaining a top speed of 48 km/h on road. With a slightly decreased top speed of 48 km/h cross country.

The Cruiser Mk. III's turret bore a striking resemblance to the A9 and A10 Cruiser tanks, which was expected, given the benefits of leveraging existing components. The approach not only minimised costs, but also expedited development and production. The turret was assembled using bolted armour plates, featuring a simple box-shaped design, with a slight extension towards the rear which acted as storage for the WS No. 11 radio.

The primary armament of the Cruiser Mk. III was the same as the previous Cruiser tanks, being the 2-pdr Mk, IX/XA main gun which was centrally positioned within the turret and shielded by a rounded gun mantlet. The gun was capable of elevations ranging from -15 to +20 degrees.

The Armour on the Cruiser III was light in order to keep its speed high. Its turret and hull featured armour with a maximum thickness of 14mm, with the rear being slightly weaker at 12mm. A few units were equipped with an added 14mm spaced turret armour for enhanced defense.

The Cruiser Mk. III with its lightweight armour, demonstrated limited combat effectiveness. Nevertheless, it played a crucial role as a foundational milestone in British tank development. Notably, it paved the way as the first British tank to be outfitted with the Christie-type suspension. A feature that would be pivotal in the development of future Cruiser tanks such as the Crusader and Cromwell. Unfortunately, it was still not produced in large quantities, and was quickly replaced by the Up-armoured Cruiser IV.

A13E2 Prototype

A13E3 Prototype

A13 Mk. I Cruiser Mk. III

A13 Mk. I Cruiser Mk. III with additional turret armour

Cruiser IV

The A13 Mk. I was built at Nuffield Mechanization and aero Ltd in 1939, however with the threat of war growing, some shortcomings were detected and by the 30th tank delivered, the War Office decided to build a new, up-armoured model.

This new tank was designated the A13 Mk. II Cruiser Mk. IV. The main improvement was the frontal armour, being increased to 30mm and the turret received appliqué armour panels covering the sides and rear with sloping. This was also adopted by later Cruiser tanks such as the Crusader and Covenanter.

With war approaching, the production order was raised to 225 units, to be delivered by the end of 1940. Nuffield facilities however, were not sufficient, so English Electric, Leyland, and LMS Railway were called to help.

The first major change was the replacement of the .303 Vickers machine guns with the BESA, which was more reliable and more accurate.

These Mk. IVA's which arrived on African soil, were the best models available at the time. They stayed as the first attack line with the 7th Armoured Division until their replacement in the fall of 1941 by the Crusader.

Most of these were lost to German anti-tank guns, but they performed adequately against lightly armoured German and Italian tanks, they were also quite reliable and popular for their speed. In total, 655 tanks were produced, and like the other Cruiser tanks, never historically mounted the 40mm Pom-Pom.

A13 Mk. II Cruiser Mk. IV

Crusader

With ventilation problems appearing when the production of the Covenanter was already well in the advanced stage. Nuffield chief engineer had already devised a new, parallel design for the A13 around their home-built Liberty Mk. I V12.

This model, combined with a longer hull, and Christie suspension, was ordered by the General Staff under the designation A15. Working day and night for many days, the team at Nuffield delivered its first prototype six weeks before the Covenanter.

It was heavier, nearly 5 tons heavier, weighing in at 20 tons compared to the other Cruisers 15-16. However it was distributed on five road wheels rather than the usual four. The double hull was almost unarmoured, housing the large suspension arms.

The Nuffield-Liberty Mk. II V12 engine, which was retained for production, provided adequate torque for the weight of the vehicle, providing a sustainable 17 bhp per ton ratio. Besides its great mobility, the range due to its large fuel tanks was okay for the huge distances in desert environments. This engine was also mated to a Nuffield constant mesh 4-speed gearbox.

The Hull was very narrow and cramped, like most other Cruiser tanks of the era, with the majority of space taken up by ammunition. The tank had a crew complement of five men, a commander and gunner in the turret, a loader and driver in the hull, and a secondary gunner manning the forward BESA machine gun.

The Officially named A15 Mk. I Cruiser Mk. VI Crusader, was quickly pushed into production after a prototype was tested in the mid 1940's. And after the failure of the French campaign, they were quickly shipped off to Egypt and took part in the first phase of the North African Campaign.

The Mark I had a semi-internal cast gun mantlet, which was replaced in later models by a larger cast mantlet. The larger sloped turret was also designed with maximal internal space in mind, and had no cupola, instead it had a commander's periscope.

The tank only had a maximum thickness of 40mm of frontal armour, which was designed to deal with most tanks for the time, however in practice this was only really enough to deal with ill-equipped Italian tanks, or German light tanks. The front glacis plate was also sloped heavily to promote ricochets.

The Crusader Mk. I with the 2-pdr gun, however, this was not adequate for later German mediums such as the later Pz. III's and early Pz. IV's.

The first unit to fight with these brand new Mk. I's was the 6th Royal Tank Regiment. They fought alongside Matilda Infantry Tanks, using their speed for screening tactics.

Due to the new threats posed by German Pz. III tanks, late production Mk. I Crusader's were given large side protective panels, attached to the upper hull, providing better protection against the Pz. III's 50mm main gun.

These panels were permanently attached from the factory, which gave these models the new designation of Mk. II Crusader. This new version also received an increased armour package for the front too, going from 40mm to 49mm. The added weight was copied by installing an improved and more powerful Nuffield Liberty Mk. III.

To save weight, the awkward turret and extra crew member was also removed, this did mean that the only machine gun left was the coaxial BESA. The larger "three slit" cast mantlet was also serial from the factory, replacing the semi-cast one of the Mk. I's.

This evolution arrived in the nick of time in 1942, just in time for some major campaigns in Africa. With this, some were converted to Crusader CS tanks, equipped with a 3 in howitzer for launching HE and smoke rounds.

Unfortunately, the new armour didn't really help much against the Germans, by 1942, they had fielded many new vehicles, including Pz. III's with the long 50mm gun, and Pz. IVs with their medium velocity 75mm, which proved deadly to the Mk. II Crusaders.

Another problem was that at this time, the Germans also had their infamous 88mm FlaK gun which was more than capable of even knocking out Churchill's. There were also severe limitations from the tank itself, It had poor handling in the sand, many repairs were needed and it had many teething problems in the field.

The biggest issue was that the lower part of the angled turret acted like a lever, when a shell impacted it lifted the turret and dislodged it from its mounting. There were a plethora of other issues such as an overheating engine, oil leaks, and cooling system issues, mostly caused by sand and erosion.

Because of this, and After the M3 Lee and M4 Shermans started arriving en masse, The Crusader's were relegated with the M3 Stuarts to screening and scouting roles. However, when the need arose for a new heavy cruiser tank, a stopgap measure was taken in March 1941.

There were trials to adapt the very powerful (at the time) 6-pdr AT gun to a tank turret, and finally, the Crusader was chosen. This was the first instance where this gun was mounted to a tank.

This led to a complete redesign of the interior of the Crusader, the frontal armour was increased to 51mm. The turret mounting points, in light of previous issues, were reinforced, and added protection was built in around the ammo racks. The crowded turret was equipped with an exhaust vent and crew was reduced to three, with the Commander also being the loader.

The Mk. III was also given a power plant upgrade, with the newly developed Liberty Mk. IV. This was mostly due to the increased weight from the added armour protection.

The Crusader, and especially the Crusader Mk. III, were always considered as stopgap before the main arrival of the 'Heavy Cruisers', which were currently in development and trials, all of which were designed to equip the 6-pdr.

The mid-1940's specification of the Directorate of Tanks and Transport targeted Nuffield among others, with Nuffield designers producing, albeit in a rush, an ungraded Crusader, the A24 Cavalier, and later the Cromwell I. This led to the inception of the Meteor engine by Rolls-Royce and the Meteor powered Cromwell. Which eventually led to the retirement of the Crusader.

Between 1941 and 1943 in its production run, a total of 5,300 vehicles of all Marks and variants were produced.

A15 Mk. I Cruiser Mk. VI Crusader (Crusader Mk. I)

A15 Mk. IIa Cruiser Mk. VI Crusader (Crusader Mk. II CS)

A15 Mk. II Cruiser Mk. VI Crusader (Crusader Mk. II)

A15 Mk. III Cruiser Mk. VI Crusader (Crusader Mk. III)

Crusader SP

A project to mount the BL 5.5-inch howitzer on the Crusader chassis. It was developed after the end of WWII. This was done by reversing the hull and mounting the gun at the front - pointing backwards. The Crusader was likely used as a test bed for future developments - the FV3805 used the same gun on a Centurion hull later on. Only one prototype was built.

A picture of the tank

FSV Scheme A

Developed in 1961 as part of the GSOR 1010 project. The GSOR 1010 was intended to replace the Saladin. The weight of the vehicle was to be 14 tonnes, and have similar mobility on land comparable to the Ferret. The engine of this vehicle was to be a 300hp Rolls-Royce engine, to allow for a top speed of 90km/h, with deflated tires this top speed would be reduced to 60km/h.

The tank was to feature skid steering, which seems to be a highlight of this design, the suspension of this vehicle would be tested in September 1962 which noted the mobility across terrain to be good, but showed concerns of the longevity of tires.

The crew of this vehicle would've been 4 men, with there being 3 in the turret, presumably these would've been the Commander, Gunner and Loader, with the Driver in the hull. Protection of this vehicle seemed to only be able to withstand small arms. The gun of this vehicle was identical to the Saladin, being the same 76mm. The name for this tank is fictional, it seems to represent a shrunken GSOR 1010 Scheme A.

A picture of the layout

Another picture

Suspension and some more details here

Engine and gearbox blueprints

FV207

Developed around 1948, it was based on the FV200 series of tanks, which aimed to be a universal chassis for any role. There were 22 tanks in the FV200 series. The FV205 - 207 were a series of Artillery projects using a 105mm, 140mm or 152mm gun. These aimed to serve as anti-tank, medium artillery and heavy artillery roles.

These projects were very short lived and were dropped very quickly after their proposal. No blueprints have ever been found. Additionally, there is an image circulating on the internet that claims to be of the FV207 but this is merely just a gun platform for evaluation purposes

FV224 Chopper

Fictional tank inspired by the Valentine and Valiant

FV227 Conciever

Fictional tank somewhat inspired by the Caernarvon

FV229 Contender

Fictional tank

FV 230 Canopener

Fictional tank

FV304

The FV300 series was brought about after a revived interest in the use of a lightly armoured vehicle to be brought into production, somewhat akin to the Chaffee and the Stuart, the A46 from 1943 aimed to be the British replacement for the latter. The development of this vehicle was very slow, and this led to a lack of interest, thus in 1946, Vickers returned to the project, this time naming it as part of the FV300 series - the FV301, this tank used torsion bar suspension instead of Christie type, and used a composite built turret as well as a new concentric recoil system for the 77mm gun. The front armour was reduced to 2 inches thick, and the weight of the machine rose to 21 tonnes.

The FV304 was an SPG version based on the same platform, and a prototype would be manufactured in 1950, this said, doubts over the whole series in general, particularly that they could see faltering value in such lightly armoured vehicles, led to the cancellation of the project. A wooden mockup with a gun was constructed for the FV303, which was also an SPG variant - just with a different gun.

The FV304 never went beyond a model, but a test chassis for the FV300 series was built. The 4.5 inch howitzer was never intended for this tank, it was only used on the BT-42.

FV301 Model

FV303 (Mockup, Again)
FV304 (Blueprints, Model)

FV3805

Developed in the late 1950s based on the idea of using a Centurion hull to mount a BL 5.5 inch QF field gun (140mm howitzer) in a case mate on the hull. This idea was considered because of the good commonality in parts with the Centurion, which was the main tank in service at the time. There would be a wooden mockup made, as well as two prototypes.

The project lost favour in the 1960s to the FV433 “Abbot” because this project was able to mount NATO standard guns, making the 5.5 inch BL obsolete. The FV3805 was built backwards similarly to the Archer, the engine and gearbox at the front, and the drivers position was moved to the centre of the vehicle, on the left hand side.

After the unsuccessful trials, P2 had its gun and mounting removed, and was instead used as an Artillery Range Observation vehicle. It was named “Major Pictons Palace” until some time in the 1970s. P1 has been lost.

The 5.5 inch gun was produced from 1941 - 1945 and had a range of 9.2 miles, BL stands for Breech Loading. It fired two part ammunition, and was first used in the deserts of North Africa in 1941, the gun remained in service with the territorial army regiments until 1980.

A picture of the wooden mockup (And another)

A picture of the prototype

Inside the tank

Observation vehicle

FV4005

The FV4005 story starts after the debut of the IS-3 in 1945, the Soviet Union developing more heavily armoured tanks, the British War Office filed a requirement for the development of a gun capable of penetrating a 60-degree sloped plate that was 6 inches (152mm) thick, at a distance up to 2000 yards (1830 meters). This led to the development of the Ordnance, Quick-Firing 183mm Tank L4 Gun. This gun was intended to be mounted on the FV200 series chassis, known as "Tank, Heavy No. 2, 183mm Gun, FV215" (The FV215b 183 as depicted in game). A project was launched to get the gun into action quickly on an existing hull, this led to the creation of the FV4005.

The development of the L4 started in 1950, and was aimed at increasing the firepower of "Heavy Gun Tanks", this gun aimed to meet the requirements listed above, and was even more powerful than the 120mm L1 gun on the Conqueror. Initially, the British looked at the development of a 155mm gun which would be standardized with the USA, however it was deemed this lacked the required punch, and so various calibers such as 6.5 and 7.2 inches (165 and 183mm) would be studied.

At this time, the British Army came to the conclusion that a "kill" did not necessarily mean the complete destruction of an enemy tank, for instance, a blown off track is seen as a kill, since it took the enemy vehicle out of action. The British army wanted something that would lead to complete destruction, meaning that attention turned to the 183mm shell, which was thought to be powerful enough to render the target inoperable.

This gun was nicknamed "Lilywhite", and the initial designation interestingly was for a 180mm gun, however in December 1952, this would be updated to 183mm, and a number of shell types were considered, however only HESH really went under further development.

Records suggest that at least 12 L4 guns were built, it was fully rifled with a bore evacuator in the middle, and weighed 3.75 tonnes. The only ammunition produced for this gun was HESH, and the shell weighed 72.5kg, and measured 76cm long, the propellant case weighed 33kg and

measured a further 68cm long. The shell velocity of this tank was 716m/s. When fired, the gun produced 87 tonnes of recoil force, and had a recoil length of 2 1/4 feet (69cm)

The L4 gun was tested against the "Super Conqueror" test bed, as well as a Centurion, in two shots, the HESH shell blew the turret clean off the Centurion, and also split the mantlet of the Conqueror in half.

The Centurion was chosen as the basis for this vehicle, and used the Mk. 3 Centurion, other than the removal of the turret, the hull was mostly unaltered, the tank had 76mm (3 inches) of frontal armour at 60 degrees on the front slope, and had a 650hp Rolls-Royce Meteor engine.

Stage I was built in 1951 as a test vehicle for the gun platform, it was installed in a rigid mount and was completely fixed in elevation. The platform had a full traverse, but firing was restricted to a limited arc over the front and rear. The gun on this vehicle used a concentric recoil system, which used a tube placed around the breech end of the barrel, to act as a space-saving alternative to traditional recoil cylinders.The tank had a gunner seated to the left, with a seat, and behind him was a rack for ammunition, there was no seat for the Loader, and he also had the loading assist device to handle the 105kg weight of each ammunition piece. This vehicle underwent a number of firing trials, it was found that there were some issues with the concentric recoil system, and this was changed in the second stage.

Stage II was also built in 1951, and was built closest to what the production version of the FV4005 would've looked like, had it ever gone into production, of course the most notable change was the construction of the fully enclosed turret. There were a few other changes too, the loading assist would be removed in this, and the concentric recoil system was replaced with a hydro-pneumatic type. The turret was intended to be splinter proof and was only 14mm thick, it was not heavily armoured as the tank was never intended to fight in close quarters, and also to reduce weight. 12 rounds were able to be carried in this tank. While the loading assist was removed for the second Stage, they decided to add an additional loader, this would allow one to handle the charge, and another to handle the projectile. It is speculated that the turret was built to test for how the crew would handle the recoil in an enclosed space, as well as the fumes, and also potential machine gun mounts. The turret was not able to fully traverse, however like the first Stage, firing was limited to over the front and rear for safety. The tank also went through numerous firing trials, and Stage II's hydro-pneumatic system operated without issue, in total 150 rounds were fired during tests, and a report from 1955 suggests that "General Functioning has proved satisfactory".

The FV4005 was cancelled at a similar time to the FV215 in August 1957, this was because these feared Soviet heavy tanks, were not being made in the massive numbers that they were expected, the need for tanks and guns like this was becoming absent, on top of this newer technology such as Anti-Tank Guided Missiles, were providing better accuracy as well as being better performing despite being smaller. The three prototypes were dismantled, Stage I went to Shoeburyness Proof and Experimental Establishment, where the turret was removed and the Centurion hull returned to service. One Stage II was offered to the Royal Military College for Science, while the Fighting Vehicle Research and Development Establishment (FVRDE) kept the other Stage II. These Centurion chassis also returned to service. At some point one turret found itself in Bovington, where it was eventually mated with a Spare Mk 10 Centurion hull owned by the Museum. Simply put, the FV4005 exists because it was seen as a stop-gap

vehicle capable of carrying the weapon intended for the FV215. The tank was considered a last resort should development of the FV215 be unfinished before hostilities may erupt. This is a similar situation to the Conqueror and FV4004 Conway's development.

Stage I: Image
Stage II: Blueprints (Side, Rear ¾)
Other: Recoil Table

GSOR 1006/7

Developed alongside the GSOR 1010 project which both began in 1961 by the School of Tank Technology, the GSOR 1006 was a group of vehicles aimed for support roles, whereas the GSOR 1010 was intended for scout and reconnaissance vehicles.

These projects were borne out of a desire for a long-term replacement for the FV601 Saladin, a number of vehicles would be drawn up in the GSOR 1006 project, under 4 categories: casemated, turreted, conversions and wheeled vehicles. All machines offered long-range firepower. All GSOR 1006 projects were intended to use a 105mm gun.

The basic requirements of the GSOR 1006 (and 1010) were to weigh under 15 tonnes, fit inside of a Beverly plane, have sufficient firepower, withstand small arms fire, and have a speed not less than 45mph (top speed of Saladin) for tracked vehicles, and not less than 58mph for wheeled vehicles.

Our GSOR 1006/7 represents the wheeled 7th design in the family, this design featured 35 rounds of HESH ammunition, with a coaxial machine gun, however the design would also feature 12 ready-to-fire missiles on the back of the turret. It was noted that all crew members, including the driver would be able to fire these, even on the move. It is not recorded how.

Ultimately the GSOR 1006 project would be merged into the GSOR 1010 project, become the GSOR 3301 AVR project, turn into the CVR project which was in of itself split into CVR(t) and CVR(w).

A picture of the version we have in game

The other version

GSOR 3301 AVR FS

Created after the morphing of the GSOR 1106 and GSOR 1010 projects in 1964, the Defence Research Committee and Director Royal Armoured Corps formed General Staff Operation Requirement (GSOR) 3301 in 1964. The AVR part of the name refers to Armoured Vehicle Reconnaissance, and there were both wheeled and tracked variants of this. F/S means Fire Support, and this aimed to replace the Saladin.

This vehicle had a height of only 1.9m and weighed around 6.5t. It was intended to be air transportable. The specific power to weight was expected to be around 33 hp/t, which gave it a max speed of 72 kph. It was only ever intended to mount a 76mm gun.

The project did not take off, as in October 1964, the Labour Party came to power, and significantly reduced military spending, this halted development of the GSOR 3301 project, and it would eventually become the CVR(T) in September 1965.

A picture of the blueprints

Top down layout view

LHMTV

Developed around July 1964 by the FVRDE and was called the Lightweight High Mobility Tactical Vehicle (LHMTV), this was a family of vehicles that aimed to fulfil a set of roles. The vehicle was partly designed in conjunction with Australia, as they also needed a range of "extremely lightweight, highly mobile, air transportable and amphibious vehicles"

Consequently there were a number of different versions planned, each based on the same chassis which was limited to 2.1m wide. This also meant that the weight limit had to be 4.5 tonnes, as these were restricted by the Armstrong Whitworth Argosy transport aircraft. This project was considered a direct competitor to the GSOR 3301 project, and a number of vehicles would be considered, ranging from a 120mm recoilless rifled gun, to a 105mm howitzer, to an armoured ambulance or even a rocket launcher. There was also a turreted 76mm gun design, similar to that of the 120mm - this is what we have in-game.

While the in-game description says one prototype was developed, it's believed this particular design was not constructed, there is a model of it as well. The project was developed for three years, however the family of designs either remained on paper or as wooden models. One of the reasons for this was that the minimum combat weight of airborne vehicles was increasing. Ultimately this project was rejected, and ultimately was morphed into the GSOR 3301 project.

A picture of the model (120mm)

Original Artwork of the tank & Various designs

Manticore

Developed as part of the 8th Technical Staff Course at the STT, in December 1955, the primary objective of this design exercise was to create a vehicle that mounted a substitute for the BAT (Battalion Anti Tank gun), this was a 120mm gun with extremely good HESH penetration, it was small and cheap to build as well as being air portable, this said it had a few downsides, it was very cumbersome, and was only reliably accurate up to about 800 meters.

The historical name for this tank was Chimera, it was intended to offer the same advantages of the BAT, as well as work alongside forward infantry positions, while retaining a low profile and

effective tank killing capabilities. On top of this, it was to be air-transportable, as well as not be limited by terrain, and still not be as costly as a tank.

The tank was required to be accurate up to 1000m, and still be able to penetrate a 120mm plate angled at 60 degrees, with at least an 80% chance of hitting the target on the first shot. The initial height of the project was 4'6, however this would be upped to 5'6 to be more realistic. The crew was limited to two people, and the top speed of the tank was intended to be between 30 and 35 mph (48 - 56 kmh). The tank was supposed to be able to withstand shell splinters, machine gun fire and mortar rounds - the primary threats to the infantry.

Three guns were considered, the first being a 180mm gun which was very quickly deemed to be impractical, it was calculated to only be able to carry 5 rounds of ammunition, and this would still be impossible to move around. The second was to mount Missiles on top as a guided weapons layout, this was also rejected as too few could be carried and it was also mounted outside the vehicle. The final gun considered was the new 105mm gun developed at the time (Likely becoming the L7 gun), due to the size of the ammunition, only 20 rounds would be carried. To get the large gun into the small platform, a concentric recoil system would be used.

The commander was also the gunner, and the driver was also the loader, this meant the tank could not fire on the move, the tank would also have a fitted device to move the rounds into the gun breech, to also aid with this, the turret was intended to be oscillating, also allowing the gun to be mounted higher than normal, this allowed for good gun depression angles.This had -10 degrees of gun depression, but only a low 10 degrees of gun elevation.

The engine of this vehicle was intended to be the 198hp Rolls Royce B81 engine, which was mounted in the front right, this was to be transverse mounted and slanted at 45 degrees to lower its profile, this was connected to a 5 speed gearbox in the front left, it used the best use of space. The fuel tank was mounted at the rear, and was relatively small at 100 gallons, this allowed for a range of 75 miles.

The Chimera ultimately would have a weight calculated to be 12.4 tonnes, which was comparable to the AMX 13 with better firepower and protection, this said the profile of the Chimera was 32 inches smaller than the AMX 13.

The project was never built, it was a design exercise to overcome obstacles, it is unlikely such a vehicle with an extremely limited crew would've ever been developed further.

Size comparison

Side profile

Internal Layout (Side, Top view)

Turret design

Suspension design

Matilda

The former Matilda, was a product of the 1929 financial crisis, this made it a rather compromised and limited vehicle, this made it quite badly suited for battlefield operations. During 1936, it began production, and a parallel specification designated the A12, was a larger, better armed model which was derived from the A7 prototype. In fact, the A12 was completely different from its little brother, in size, weight, drivetrain, armament, and crew complement. Every part of the tank was different.

Of the previous A7, only three prototypes were ever built by Vickers, of which were only requested internally for potential Army or other contracts. They were built from 1929 to 1933 and incorporated elements which largely influenced the A9 Cruiser Mk. I, and the A12 Matilda, including its drivetrain, suspension, and part of the armour design.

The third and last prototype, the A7E3 probably had the largest influence on the Matilda II, as it incorporated a twin diesel AEC C1 and QF 2-pdr gun. However, it was way too lightly protected to be classed as an Infantry Tank.

The Matilda II or sometimes referred to as the “Matilda Senior”, was an absolute unit, weighing in at around 60,000 lbs. Armed with the new QF 2-pdr gun, one of many derivatives that stemmed from the license-built 40mm Bofors.

The turret was hydraulically powered and had a three man complement which was cast as one piece of hardened steel. It had an almost cylindrical, which was slightly sloped, and tall enough to accommodate the main gun and a coaxial machine gun.

The 2-pdr had elevation levels of between -15 and +20 degrees, giving it the ability to use ridgelines to hide the hull effectively. The gun only fired solid shots, but the coax was used as a scapegoat for the lack of HE ammunition.

However, the emphasis for the Infantry Tank was on its armour, and it by far made up for all its shortcomings. With 78mm of frontal glacis and turret armour. This, at the time, was far beyond the thickness of armour on any tank with the most heavily armoured tank at the time being the French Char B1 Bis, which had ‘only’ 60mm of frontal armour.

The sides didn't skimp out either, being between 65 and 70mm thick, with the rear being 55mm. The turret roof and engine deck also had relatively high armour values, sitting at a cool 20mm.

The weight of such armour conditioned other features of the design, most notably the twin diesel AEC engine arrangement mated to a Wilson epicyclic pre-selector 6-speed gearbox. These engines were connected with a common crankshaft, which was complicated to maintain and had few redundancies, meaning if one engine was damaged or broken, it was tough to move.

It also had numerous double bogies, with paired bell cranks with a common coil spring system, which was quite an archaic system, used on the old Vickers Medium Mk. C tanks. It was intended to distribute the sheer mass of the tank.

The very first model of the Matilda II was equipped with several features that would disappear with the production Mark I and Mark II. The suspension on this pre-production model had three return rollers, they were later replaced by track skids to ease production and maintenance.

The Mk. I was never official really, being the first batch delivered in 1939. Most were lost during the French campaign in 1940. The Mark II, like the Mark I, was equipped with a Vickers machine gun, characterized by a large armoured mantlet.

By late 1940, this model was replaced by the lighter and more recent BESA machine gun and lost its armoured mantlet. This was known as the Matilda IIa Mk. II.

The next model was the Mark III, saw the removal of the twin AEC bus engines, and was replaced by the two more modern Leyland Diesel engines. This gave it more operational range and more reliability.

The Mark IV which was produced between 1941 and 1942, which introduced an improved Leyland diesel engine, and the turret's leather belt fixation was replaced by a fixed tubular mounting. This was the main production variant, with an estimated 1,200 units produced by 1942.

Finally, the Mark V, which was built in 1943, was the last serial version of the Matilda II, fitted with an improved gearbox and Westinghouse air servo. Some attempts were made to replace the old QF 2-pdr with the more efficient 6-pdr high velocity gun, already tested on the Cromwell, Cavalier, and Centaur. Notably, a prototype where a Cromwell turret was fitted to a Matilda II's hull, however none of these designs were produced.

When the war broke out in September 1939, only two Matilda II's were serviceable. The other deliveries were pressed into service quickly after training. The same year, another order was placed to Rouston & Hornsby, and in 1940, to John Fowler & Co. The next batch, ordered between 1941 and 1942, were given to London, Midland, and Scottish Railway, Harland & Wolff, and eventually North British Locomotive Company in Scotland. Production ended in August 1943 after a total of 2,987 units of all marks were built.

The Matilda II was basically impervious to anything the Germans and Italians fielded for the better part of 3 years, which gave it the nickname "Queen of the Desert", until high velocity 50mm guns and 75mm guns started to become commonplace on the Pz. III and IV's, and with the introduction of the Infamous 88mm Flak gun, the armour started to become obsolete.

By mid 1942, the Germans had devised efficient infantry tactics using their PaK-38 and the long barrel 50mm on the Pz III J models to deal with Matilda II's. One solution to this was to upgrade the main gun, but with a turret ring of only 1.37m in diameter, no superior gun could be mounted without a major redesign of the entire hull. Such a project was attempted in 1942, but after a single prototype was tested, the production was dropped for modern late-generation cruiser tanks.

In Africa, the Matilda was gradually phased out by the Valentine, with damaged and worn out Matilda's being retired and replaced by other models. Some were shipped off to less threatening

theatres such as South or Eastern Africa, for operations against Italian Somaliland and Erythea in 1941.

Others were shipped to Greece, Crete, and Malta, to prevent any German landings there. Matilda's took part in the battle of Gazala, and the first battle of El Alamein, however, with further losses, many were converted for other uses.

When the M3 Lee/Grant and M4 Sherman tanks, which were faster and equipped with much more potent weaponry came in droves, the remaining Matilda's were shipped back to Britain.

Picture of the Matilda II (Matilda IIa Mk. III)

Saladin

Developed in 1954 to replace the AEC Armoured car. The Saladin was based on a common chassis designed by Alvis (FV600) which would be used for other vehicles such as the Saracen. The Saladin would use the same 6x6 wheelbase, but was considered a dedicated armoured car, unlike the Saracen being an APC.

The Saladin was fairly conventional in layout, with a rear engine and driver in the front. The turret of the vehicle mounted the 76mm L5A1 gun, which was well regarded for its time, it was capable of engaging early cold-war tanks.

The crew layout of the tank was also very conventional, just being a driver commander and gunner. Power for the vehicle was supplied by a Rolls-Royce B 80 Mk6A engine, which output 170hp. This allowed for a top speed of 72km/h with an operational range of 400km. Suspension for the vehicle was spread out across all 6 wheels. To keep the mobility of the vehicle high, the tank was extremely light at 12.7 tons, and this also meant the armour of the tank was negligible, only able to withstand small arms fire.

Nonetheless, the Saladin was extremely popular for export, particularly to middle eastern countries, since the vehicle could cope well with the weather, as well as the relatively low cost of buying the Saladin. Just over 1200 units would be produced from 1958 to 1972, and a few were still in service in 2010 in Sri Lanka.

Despite the only gun the vehicle was in service with being the 76mm L5A1, there were attempts to upgun the vehicle with a 90mm gun, this would be done by GK, however it was never completed, this vehicle would also feature a redesigned turret to house the larger gun.

A picture of the tank

A picture of the attempted up-gun

Setter

The Royal Army had no luck with light tanks for a very long time. The Light Tank Mk. VI, developed in the late 1930's was outdated by WW2. The Tetrarch and Harry Hopkins were hastily developed during WW2, but were hardly successful. And with the Americans developing the M5 Stuart, there was no real need for the British to develop any light tanks.

Fast forward to the 1950's, where the Brits managed to build a successful wheeled armoured vehicle, the FV601 Saladin, which was quite well received. However, the Military was in need of a tank. Wheeled armoured vehicles only really have enough armour to protect against small calibre ammunition and light anti-tank rifles.

This led the General Staff to prepare the technical and tactical requirements designated "GSOR 1006" and "GSOR 1010" in 1961. This regulated the creation of light airborne armoured vehicles. Two years later work began, and seven different combat and auxiliary vehicles were planned.

At this time, the British Army General Staff put forward requirements for a light tank to receive a new Hawker Siddeley HS.681 transport aircraft which can carry 15.9t. Which means, if you subtract the weight of various devices, only 6.25t of weight remained for each of the two transported units. This meant the light tank had to be lighter than the Soviet Ural-375 Truck.

This led the military to design a small, compact, three man crew, and decently armoured light tank. The technical design was finished in 1964 where it was given the designation "GSOR 3301 AVR FS". This vehicle had a height of only 1.9m and weighed around 6.5t. The specific power to weight was expected to be around 33 hp/t, which gave it a max speed of 72 kph.

Unfortunately, this didn't come to fruition, as a new government came to power, military spending was drastically cut in October 1964, with the Hawker Siddeley HS.681 being one of the first. Luckily, the GSOR program was more fortunate. It cost less, so development continued.

The GSOR project was significantly reworked, and as a result, the abbreviation AVR was changed to CVR(T) which stands for "Combat Vehicle Reconnaissance, Tracked". And, to console the military, who lost many toys due to budget cuts, the government allocated £123,000 for a new tank in September 1965.

Initially, the vehicle was planned to mount a Rolls Royce B60 engine, but the idea was far from ideal. Soon, it was realised the Jaguar XK 6-cyl was a better option. This was taken straight from the Jaguar E-Type and made 195 hp. Since the British did not have their own transport plane, they opted to use the American Lockheed C130 Hercules. Which allowed a weight increase. The tank also mounted a 76mm gun.

By Summer of 1965, the combat weight of the GSOR 3301 was expected to be around 7.7t, more than a ton heavier than the original GSOR 3301. The tank was even given hydropneumatic suspension, but it was removed in favour of torsion bar soon after.

When designing the turret, development from previous projects was used. This meant that the

turret turned out to be more spacious and well-developed in terms of visibility. And by this point, the maximum speed was planned to be 80 kph.

Although, like many unknown designs, it was a stepping stone for other CVR(T)'s like the FV101 Scorpion. In total, several were built, with many differing greatly from the others. One of which, chassis code TV15000, is on display at the Bovington today.

If you are wondering why I haven't mentioned Setter yet, that's because the GSOR 3301 CVR(T) IS the Setter. There was also a wheeled variant of the Setter called CVR(W).

Another Picture of the GSOR 3301 CVR(T)

GSOR 3301 CVR(T) Blueprints

Staghound

Like other countries in WW2, The US realised that the need for a light armoured car for scouting was pivotal. A medium armoured car was also sought after in July 1941 prior to the US involvement. Two designs were entered by Ford and Chevrolet. Ford submitted a design that was 6x6 with a turret armed with the 37mm Gun M6, while Chevrolet entered a more compact 4x4 mounting the same turret. Ford's design was designated as T17 "Deerhound" and Chevrolet's design was designated as the T17E1 "Staghound", with both designations coming from the British.

The Brits were in need of as many armoured cars as possible during the early phases of the North African Campaign. They commissioned Ford's T17 to be serially produced and it was granted in October 1942 by American Authorities. Meanwhile, the US Army eventually settled on Mass production of the M8 Greyhound, another 6x6 system more inline with the Armies needs. The T17 production requirements were measured against availability of the new M8 and was kept in lower production as the M6.

The British focus however, fell on Chevrolet's design, the T17E1 Staghound. This seemingly met the requirements for service, particularly in the North African Campaign as experience of fighting began to flesh out. The US Army had already commissioned 2,000 in Jan 1942, and it was followed by 300 for the Brits. However, similar to the T17. The M8 Greyhound had moved forward ahead of the T17E1 and the majority of the 2000 ordered was cancelled. Nevertheless, the British requirement stood solid and a couple thousand were delivered through the Lend-Lease agreement for the North African Campaign. In total, between October 1942 and April 1944, 3,844 of these were built.

The version of the Staghound we see in-game, is a late war British modification of the tank, designated as T17E1 Staghound Mk. III, which mounted the Crusader turret and the larger 75mm gun. As far as I can tell, around 32 Staghounds were upgraded with this modification.

Super Conqueror

Developed from spare parts as a static test vehicle, specifically for testing ammunition. This vehicle would be tested against HEAT and HESH ammunition to test their effects on armoured vehicles. The vehicle would be covered with additional 0.5 - 1.1 inch thick armour plates over the front and the turret cheeks.

The vehicle would be used in tests against the 183mm gun of the FV4005, 165mm gun of the FV3903 Churchill AVRE, Malkara missiles and even prototype American T42 “Dart” HEAT shells. The vehicle was stocked with APDS and HESH ammunition, and the crew positions were filled with life-size dummies.

The name Super Conqueror is fictional. Likely stemming from the same name designations the Americans gave some of their tanks that were given added spaced armour, for example the “Super Pershing” and “Super” variants of the M48 and M60 Pattons.

The turret the vehicle is portrayed with in game uses the early design turret for the Conqueror, the difference is apparent in the cupola of the vehicle compared to what was actually used. This turret design never featured the spaced armour

A picture of the tank

Another picture (Shows the thicknesses of the plates)

Another picture (Front plates removed)

Tortoise

Expecting the battlefields of World War II to develop as they had in World War I, British tank designers set about designing a tank that could breach any fortifications the enemy may build, and shrug off any returning fire.

Previous studies had led to the A33 Excelsior assault tank and a dead end. It was basically just an up-armoured version of the Churchill Infantry tank built on the Cromwell’s chassis.

Nuffield Mechanisation & Aero Ltd soon answered the call for a completely new project, with no less than 18 separate designs lasting until February 1944. Eventually, the AT 16 was approved by the War Office.

This vehicle would soon become the tank we all know and love. The A39 Tortoise Heavy Assault Tank. The official reason why it was named ‘tortoise’ is unknown, but the name was reserved for a heavy AFV in 1942, however, that never left the drawing board.

The Tortoise perfectly encapsulates its namesake, its slow and ungainly, but incredibly well armoured. It was one of the heaviest British tanks ever built, weighing 78 tons, with only the Mighty TOG II superseding it, weighing 80 tons. Or so you think, sike, the TOG II only weighs 69 tons, get over it, the Tortoise has always been the big boss.

Most of its weight came from the armour, which was up to 230mm thick, and its potent 94mm high velocity gun. This was expected, as its intended role was an assault tank. The entire tank was a single monstrous piece of cast steel.

The 94mm High-velocity gun was incredibly powerful. More powerful than any weapon carried by any serving British vehicle during World War II. The gun was technically called the Ordnance Quick-Firing 32-pdr, which was intended to supersede the QF 17-pdr.

Like the feared German 88's, it was derived from an anti-aircraft gun. It used a separate charge and shell. The gun proved more than capable at destroying both concrete structures and tanks, thanks to its 14.5kg APCBC shell, which was fired at 880 m/s.

The tank carried 60 rounds of ammunition with 12 in the "ready-rack" stored in various spots under the floor of the crew compartment.

The 32-pdr gun was fixed to a large ball mounting in the centre of the tank's frontal armour. This was protected by a large riveted armour collar. This allowed for an incredibly wide firing arc of 40 degrees left and right, and an elevation angle of +20 and -10 degrees.

Tests were performed against a Panther at 1,000m, showing it could easily punch through its frontal armour. In fact, it was found that the 32-pdr could deal with basically any late war German tank, including the Tiger II and the infamous Jagdtiger.

The tank was armed with three compact BESA 7.92mm machine guns as secondary guns. Two were mounted inside a rotating cupola on the right rear of the superstructure. While the other was in a ball mount on the top left corner of the frontal superstructure.

The huge vehicle had a crew complement of 7 men which consisted of a commander, gunner, a machine gunner, two loaders, and a co-driver.

Mobility, as hinted at by the name, was not one of its strong points. The 78 ton behemoth was propelled by a 600hp Rolls-Royce Meteor V12 derived from the Merlin engine used in the Spitfires.

However, fitted to this beast, only gave a power-to-weight of 7hp/ton. Therefore, the top speed was capped to 19 km/h on a flat at its best. On rough terrain, it was even slower. As you would expect, this tank was extremely thirsty, with its 530 litre fuel tank only affording it 140 km of operational range.

The drive wheels and transmission were located at the front of the vehicle. The driveline consisted of four bogies on each side. Each bore two doubled, rubberized road wheels on torsion bars.

With the end of the Second World War, only six Tortoise prototypes had been constructed, and these were not delivered until 1946. A few of these were sent to Germany for testing as part of the British Army of the Rhine (BAOR). During trials, it showed its reliability. The gun was incredibly accurate, proving itself to be a very stable gunnery platform.

A serious problem however, was logistics. The sheer logistical nightmare even one of these machines created was caused by its weight, requiring two heavy-haulage trucks to even have a hope of moving it. On top of that, one of the British Army's mobile bridges had to be employed.

Today, there are two surviving A39 Tortoise's. One in perfect running order at the Tank Museum in Bovington. The prototype was moved there after its trials concluded in 1949. The other, can be found at the Kirkcudbright military training area in Scotland, its on MOD property and cannot be recovered as of yet.

A39 Tortoise

A39 Tortoise Blueprints

Valentine

The Valentine tank was unusual in that it was conceived as a private venture by Vickers and not to a general staff specification. It was designed as an Infantry Tank, but cheaper and easier to build coupled with greater mechanical reliability than the Matilda II.

The origin of the name 'Valentine' is not officially known, although it is connected in various aspects. The design was shown to the War Office just before Valentine's Day in 1938, while Vickers chief designer, Sir John Carden, was Valentine. And Valentine was an acronym for Vickers full title "Vickers Armstrong Limited (Engineers) Newcastle-upon-Tyne". However, it was officially known to the War Office as Infantry Tank Mk. III, but to its crews, it would forever be known as Valentine, or Valley.

The running gear was based on the A10 Cruiser tank, which was an earlier design by Vickers. It was armed with a Ordnance QF 2-pdr main gun and a coaxial BESA machine gun. The frontal hull, front and sides of the turret were all 60mm thick.

The weight of the Valentine was similar to that of the A10 and to enable the vehicle to have higher protection, the Valentine was small, which restricted the turret dimensions and made installing anything bigger than the 2-pdr difficult.

Another disadvantage of the height/weight was that the turret was unable to be fitted with a commander's cupola, restricting his ability to see without exposing his head and shoulders. The small two-man turret meant that the commander also had to act as a loader, which made combat awareness more difficult.

Interestingly, the driver actually sat in the front of the turret. He had a small 'letter-box' armoured flap for front view, and two periscopes in the roof above his head.

Valentines were produced in 11 different versions, all with differing power plants and armaments. The Valentine's effective top speed was 15 mph, the same speed as the Matilda II, however, the Cruiser-type suspension allowed the Valentine to keep its speed when turning or crossing rough terrain, where the Matilda II had to slow down.

The first production version of the Valentine, designated officially as Infantry Tank Mk. III Valentine Mk. I, or just Valentine I for short, was fitted with the AEC petrol engine, derived straight from a commercial bus.

Later models, including the Valentine II and Valentine III, were given the more powerful and economical AEC A190 Diesel engine, both being mated to a 5-speed clash-type Meadows gearbox.

The Valentine's Mk.IV to Mk. IX had further powerplant upgrades, being given the GMC S-Type 6004 6.7 litre. This greatly improved Valentine's performance both on and off the road. The Mk. IV is also when the Valentine received an improved transmission, being given the Spicer synchromesh gearbox.

As previously stated, the Valentine was designed with the Ordnance QF 2-pdr in mind as its main armament. This gun was fitted, along with the two man turret, accessed via a large two-piece hatch in the roof, to Valentine Mk's I, II, IV, and VI.

For the Valentine Mk. III and V, the turret was enlarged to accommodate a third crewman. The Commander was squeezed in directly behind the gun recoil shield. Although this did leave him free to command the tank and/or the squadron, it must have been a bit jarring when the gun was fired.

The Valentine Mk IX was supplied from late 1942 to mid 1943, and was armed with the brand new Ordnance QF 6-pdr gun and a two man turret. Unfortunately, due to the size of the turret, there was no room for a coaxial BESA machine gun. This was remedied in the Valentine Mk. X, which was produced from July 1943.

The final version of Valentine was the Mk. XI, and was armed with a 75mm gun and the two man turret.

Entering service in November 1941, the Valentine was immediately sent to North Africa where it took part in Operation Crusader. Interestingly, due to a shortage of Cruiser tanks, the Valentine was used in their place for similar roles, it proved well due to its speed and manoeuvrability. The Valentine tanks continued to support Infantry action in North Africa, being highly respected by troops who had previously felt let down by British Armour.

Valentine losses were higher than necessary in North Africa, mainly due to poor tactics by senior commanders, asking the Valentines to chase the enemy tanks, or be used as anti-tank gun screens. None of these losses were due to the crew or the tank.

By the time of the second battle of El Alamein in October 1942, the Valentines began to become obsolete, with the arrival of the more modern Grant and Sherman tanks. They were relegated to infantry tank units duties, and never fully left the fighting.

Although worn out, they proved highly reliable mechanically and very tough during the chase to Tunis. There were reports of some Valentines having their front idler wheel wearing out, but the crews simply shortened the tracks to reduce slippage.

In December the same year, Middle East Command officially considered the tank obsolete. Even the 6-pdr versions became inferior compared to the newly acquired Shermans. The frontal armour was also inferior to that of the M4.

Despite this, the Valentines still took part in the assault on the Mareth line in Tunisia in March 1943, but the 6-pdr gun was found to be needing more firepower due to the lack of any effective HE rounds.

By the invasion of Sicily, most regiments had fully converted to the Sherman, with most of the better Valentines being given to the Free French Forces in North Africa where they were used as training tanks.

With a total of 8,275 Valentine's of all marks and variants built between 1940 and 1944, the Valentine served in front line units until the very end of World War II. It was used successfully as an Infantry Tank, a Cruiser Tank, a Training Tank, and the basis for a Self-Propelled gun among other specialized variants.

It gained great affection from its crews, was very simple to maintain and produce, and was incredibly reliable and versatile. However, due to the rapidly expanding technology of the war, it was very quickly outperformed by its American counterpart.

Valentine Mk. I
Valentine Mk. II
Valentine Mk. III
Valentine Mk. IV
Valentine Mk. V
Valentine Mk. VI
Valentine Mk. VII
Valentine Mk. VIII
Valentine Mk. IX
Valentine Mk. X
Valentine Mk. XI

Valentine AT

Developed in early 1942 after it was considered that the 2-pdr gun was becoming obsolete against German tanks. This vehicle was intended to mount the more powerful 6-pdr gun. At this time light tanks were not in production, and there was a shortage of Cruiser tanks. This meant that the only available chassis for conversion was the Valentine.

Metropolitan Cammell Carriage and Wagon Company (MCCW) was tasked with building the prototype, they used a Valentine I tank numbered T.20425, the turret would be removed and a pedestal gun mount would be placed instead. The fighting compartment would be protected from all sides against small arms fire.

This tank would be tested in 1942 but never put into production, the effectiveness of the design was less than the equivalent German tank destroyers, and offered a larger profile than the Valentine whilst also being weaker in armour. The Valentine IX with the same gun was already in development and looked much more promising.

A picture of the prototype

Another picture

Premium Tanks

A25 Harry Hopkins

Vickers-Armstong's take on the Harry Hopkins project was an improvement of the Mk. VII Tetrarch. After service reports, it was decided to improve upon its armour protection. However, this is difficult to achieve in a light tank design.

Vickers decided to increase the frontal armour to 38mm, and the sides to 17mm. The turret was sloped, increasing its effective thickness, rather than adding extra weight with more armour.

Dimensions were also increased by 6 inches in length, and 1 foot, 3 inches in width, this unfortunately, had a detrimental effect in making the Mk. VIII unable to be air portable, too heavy and wide for the standard Hamilcar Glider. So Vickers neglected its use as an Airborne tank from there on out and focused on its role as a Light Tank.

Vickers decided not to improve its engine, and kept the engine from the Tetrarch, however, due to the increased weight, mobility was less impressive, with a top speed of 48 km/h, barely above that of the Sherman's.

Its Armament was also identical, using the small but effective and incredibly accurate Ordnance QF 2-pdr which was coupled with a coaxial BESA .303 machine gun.

The Harry Hopkins was plagued with many issues during development, some were even inherited from the Tetrarch, including the odd steering system which was mechanical, which made the narrow tracks bow. To counter this, all eight road wheels were tilted in different ways to bend the tracks to reduce the mechanical strain due to the lateral movement.

However, by mid-1941, some in the War Office and British Army estimated that light tanks were no longer desirable, lacking armament and armour, and were often foreshadowed by cheaper armoured cars. In general, they performed poorly in many engagements.

There were many reports from the Battle of France of their performance, mainly due to improper use, ergo using them to engage enemy tanks head-on, despite this, their main role, was quickly replaced by cheaper and more mobile light armoured cars with smaller crews and even better cross-country ability.

Nevertheless, Vickers-Armstrong submitted their design for the Officially named 'A25 Light Tank Mk. VIII Harry Hopkins' to the War Office in September 1941, and soon afterwards the Tank Board of the War Office ordered 1,000 of them.

This figure quickly jumped to 2,410 in November the same year, and production was scheduled to start in June of 1942, with 100 being built monthly. Metro-Cammell, which was a subsidiary of Vickers, was chosen for this task.

Production started as planned in June 1942, however, as soon as they began to leave the factory floor to be tested near the factory, unspecified problems surged. This was sent in a

minute to Winston Churchill in September 1942, from the Ministry of Supply, which basically read that deliveries were delayed due to developmental problems.

A further report by the War Office in December the same year was more precise and categorical, listing a number of modifications to allow the vehicles to be mass produced Notably, the front suspension proved problematic, demanding extensive modification.

By July 1943, another report from the Fighting Vehicle Proving Establishment indicated that many “serious defects” were still present in the production vehicles. This became so acute that trials were completely abandoned before completion.

On August 31st, 1943, six Mk. VIII tanks had been delivered and returned countless times, spanning over a year. By this time, the War Office estimated initially that 100 would be operational by January 1943.

However, again, jagged development history meant that Metro-Cammell was forced into producing the vehicle despite its countless major flaws. The production run officially ran until February 1945, when it was officially cancelled, with only 100 being completed.

For the Mk. VIII, this meant that they were already undesirable and were in addition, obsolete when its production ended. In fact, none of the Mk. VIII’s ever saw combat. Reconversion plans were made by the War Office, but the only variant that had any sort of life span was the short-lived Alecto Self-propelled gun project.

A25 Light Tank Mk. VIII Harry Hopkins

A43 BP

For history on this refer to the Black Prince

A46

Lessons from the Tetrarch and to a much lesser extent the M3/M5 Light tanks had been taken into consideration. Vickers decided they wanted a gun capable enough to fight other light and medium tanks, while having a useful HE round, ideally sharing commonality with current munitions in service. So the gun decided on was the 77mm QF gun which Vickers was testing on the A34 Comet Medium. Originally, this 77mm was prioritised for the A46 project, however, due to there being turretless Stuarts fulfilling the role already in combat, and with the likelihood of the Comet seeing combat, they gave priority to the A34. Nonetheless, two prototypes were designed, one with a rear-mounted engine, and the other with a frontally mounted engine. Vickers happily agreed to this as it saw the future growth of the system and that modularity was quite impressive. Even though Vickers had not presented plans as of yet, the War Office ordered 80 to be built in 1944.

Later, on November 15th, 1944, the 44th meeting of the Tank Board took place. It considered the paper proposals as requested for the light tank roles. Later on the 3rd of January 1945, a

meeting stated that no real issues had thus far hindered the project. Production should have begun around mid-1946, noting the tank “looked extremely good and should appeal psychologically to the troops”. Vickers managed to build a full-size mock-up before the war's end.

At this point, the War Office was considering three new lines of vehicles, including the A45, which became the FV200 series of heavy tanks, the A41, which became the Centurion, and the A46. In 1947, development was still underway with the engine options being limited to either the B80 Rolls Royce engine, or the GM 6-71M Diesel, however the B80 was preferred as the British wanted to diminish their reliance on the Americans.

They were also realising a four-man crew was going to be too cramped for long distance activities but not much could be done due to the gun being set in stone. Lastly, the Elswick department began work on an autoloading system for the 77mm QF gun, which allowed the crew to be reduced to three. Unfortunately, all of this was to no avail, as the design specifications had basically turned the project into a fully enclosed APC and was eventually merged into the FV300 program

A7E3

The A7 project was a continuation of the A6 project, designated Medium Mk III. Three experimental A6 tanks were built between 1927 and 1928, however, no matter what modifications were done to the suspension, the chassis could not be supported. This became more evident during trials which led to a whole new index.

The A7 was built as an alternative to the Vickers tank. Mounting similar armament and having similar armour, the vehicle was to be around the same weight, with the limit being 14 tons. The crew complement was reduced to 5, with 3 residing inside the turret.

As for the suspension, not much was changed, with further development solutions used in the Birch Gun project. A more powerful 120hp air cooled Armstrong-Siddeley engine was installed due to the increased mass. By May 1929, Experimental A7E1 and A7E2 tanks were ready. The A7E1 used a 4-speed Armstrong-Siddeley gearbox, while the A7E2 used a Wilson hydraulic planetary gearbox.

These prototypes entered trials in 1931, showing that the designers were heavily optimistic with their calculations, stating the tanks could achieve a theoretical top speed of 40 kph, while in practice they could only manage around 24 kph. Again, the suspension was a limiting factor due to their weight, with the leaf springs on the A7E1 being most notable. The A7E2 had vertical coil springs, which performed better, but were still overworked.

Trials of the A7E2 continued until 1936, where it was clear that the tank was a failure and further trials were cancelled. This led to requirements for a modernized A7 in January 1934. The design of the hull and turret, as stated previously, were already quite good, with main efforts focusing on the issues revolving around the driveline and suspension.

The first to go was the old and tired air-cooled Armstrong-Siddeley, with the designers turning towards AEC. This led to the 6-cylinder 7.7L 126hp engine due to its setup using the Wilson planetary in the buses. The suspension was also radically changed, with each road wheel receiving a vertical coil spring.

At the same time, the hull was modernised with a wider turret platform and a new machine gunners hatch. The turret was also altered to mount the new 2-pdr gun.

This new prototype, designated A7E3, was built in May of 1934, and entered trials in 1936. The first few trials showed that this tank surpassed its predecessors in every way, even though its mass had increased to 18.2 tons. The more powerful engine allowed the vehicle to reach speeds of roughly 39 kph, wiping the floor with the previous prototypes' 26 kph.

However, it was not all sunshine and roses. Like the previous prototypes, the tank was plagued with breakdowns, with a total of 7 breakdowns during the duration of the trials. This led to the idea of installing the Vickers-Horstmann suspension, previously tested on the A6E3, but these were discarded due to the added weight.

Later, in December 1936, the idea of mounting the Liberty L-12 engine and transmission from the Christie M1931 was raised, which theoretically would increase the tanks speed to 61 kph, however this, again, was optimistic with calculation predicting a value closer to 56 kph. And, as seen on the American Medium Tank T2, this did not resolve its limitations imposed by the overworked suspension and unsurprisingly, the A7E3 project was closed in 1937.

AC 1 Sentinel

When WW2 broke out, Australia only had 4 Medium Mk II* tanks, 10 Light Mk VI's and eventually some M3 Stuarts were provided in September 1939. This said, after the fighting in North Africa and the defeat in France, Australia was not a priority for Britain, so they seeked to create their own tank.

The idea of building a light cruiser tank was voiced on June 12th 1940 which the prime minister of Australia, Robert Menzies, took part in. They planned to make a 10-ton tank to be ready by the end of 1941, the issue was that they didn't even have set requirements for the tank that they wanted to order in large amounts.

As soon as more calculations were done for armour requirements, it was realised the weight would increase significantly, first 12 tonnes for 28mm all round armour, but this was realised to be not enough, so the tank then was intended to weigh 15 tonnes. The armament remained the 2-pdr gun.

Menzies asked the British for help on August 20th 1940, and Colonel Watson was sent who became the main developer for the tank, he later departed for the US in October the same year. Watson studied American tanks, as well as gaining access to materials on the M3 Medium tank, it had a significant influence on the Australian cruiser. The new requirements for this would be laid out on February 18th 1941, the mass of the tank was now 20 tonnes, and the tank needed a 400hp engine to reach a top speed of 40kph. There was a Guiberson radial engine considered, but was rejected due to issues with delivering them, the most viable seemed to be the 5.7L

Cadillac which could develop 150hp, it was readily available, however it was clear that one engine was not enough.

While inspired by the M3 Medium, Watson tried to combine the best solutions from worldwide tank building practices, and adapted them to the abilities of the Australian industry, by January 1941, Australia required 660 tanks. Some of the big influences on the design were the Hotchkiss H39 suspension, and the use of cast components, such as the M3's turret and the M3A1's cast upper hull. Only the French used fully cast hulls at the time, and the AC 1 aimed to use casting wherever possible; the hulls would be produced by Bradford & Kendall in Alexandria, Sydney. The only part of this tank that was not cast, was the hull floor. The transmission housing was also cast, and put into the front of the hull, with the engine being at the rear.

By Spring 1941, the weight of the tank was expected to be 25 tonnes, with 60mm thick armour, with the gun the same as it had always been, the 2-pdr. The bar had been raised for the mobility of the tank to have a speed of 55km/h, however the engine stayed the same, this time three separate engines were combined in output, two placed in parallel, with one behind them. Apparently this combination worked fine.

The second set of trials would begin in March 1942, and the first production tank was delivered in July, it was quite mobile, able to go 38.4km/h in normal operation, and 46.4 with a speed governor. The armour varied from 45 to 65mm, and the tank was also able to store 130 rounds. This said, when put into production, there were all sorts of limiting factors, the company producing the hulls, could only deliver 5 sets of armour a week, on top of this, military trials suggested the tank was prone to overheating, the turret traverse mechanism worked poorly, bug the biggest factor in this tank's demise, was the introduction of Matilda's and Grants in December of 1942, with a total of 737 American tanks, and 200 Matildas. This was more than enough. In total only 66 were made and they were used for training purposes. These remained in service in this role until 1946 when most were scrapped, only 3 remain today.

A picture during assembly

A picture of the tank

Another picture

AC 4 Experimental

An alternative development of the AC III to mount the 17-pdr gun. This required a new turret with a 1626mm turret ring. The gun was altered to move recoil elements inside the fighting compartment. The shipment of these guns were delayed, so the turret was installed on an AC I prototype and mounted with two 25-pdr guns to imitate the recoil of a more powerful gun. The first trials for this came in October 1942. This was also the same time that a mount for the 17-pdr would be produced.

This new tank ultimately was successful in trials, however the turret ring diameter would be increased to 1823mm, which is even larger than the Tiger's. Another intended modification of

this tank was the new engine, being the Quad-Gypsy 510hp engine, this would've significantly improved the mobility, however only a demonstration unit would be produced. The AC 1 with the 17-pdr still survives to this day. It was deemed that it was not necessary to continue production in the Summer of 1943, it was decided the Matilda and Lee/Grant tanks were sufficient for the time.

A picture of the prototype

AT 15A

Drawn a week after the AT 15, the design was essentially a modification of the AT 15, it was slightly longer with a redesigned engine bay, and some slight modifications to the casemate, which was positioned slightly further back. The ventilation system was also different in this version. The reasons for why this redesign happened is not recorded, however it may be to centralise the centre of gravity. This contributed towards the A39 Tortoise.

A picture of the tank

Caernarvon AX

This tank is a fictional "upgrade" to the Caernarvon, historically this tank was merely a stop-gap before the Conqueror was put into production, this upgrade combines 4 real elements, but these historically were never put together or even considered. The engine, turret, armour plates and hull.

The turret was a real project, however most of its history has been lost, the official name for this turret is "Centurion Mantletless Turret", the Action X name appeared in a book in the 2000s after the author cited seeing the name written on the back of a photo of the turret. Three of the turrets were made, and two of them were fitted and tested on a Centurion Chassis, the other was destroyed in a firing trial. This turret was never intended to be installed on any FV200 tanks. On top of this, the additional turret armour on the cheeks comes from the "Super Conqueror" which in reality was a target vehicle for testing HEAT and HESH ammunition.

The armament for this vehicle is at least accurate to the vehicle, the Mantletless Turret was tested with a 20-pounder, to be nitpicky, it was never equipped with a thermal sleeve until the 1960s. This gun was at least, the main armament of the Caernarvon.

The engine of this tank is allegedly equipped with a Rolls-Royce Griffon, which is an aircraft engine, while a number were converted for use in tanks, there was no plans to convert this, the Meteor is the correct engine.

In summary, the turret was not developed until the 1960s, and was also never planned on either the Conqueror or Caernarvon. The chassis was already obsolete by the 1960s, and the Chieftain was in development.

A picture of the Caernarvon

The AX turret

Caliban

A project of the Royal Military College developed in the early 1960s intended to be ready by 1962. It was a study on the current heavy tanks and a proposal to fix their issues. The tank was intended to have high mobility and a 160mm gun though a smaller one was later considered. The tank was intended to work alongside a mobile infantry division, while also being able to destroy fortified positions as well as prevent Soviet breakouts. The main focus of the tank was to have a 3 man crew, weigh 22.5 tonnes and be air transportable, but the final predicted weight would be 28 tonnes. A few proposals of Project Caliban were considered, and the 4th design is what we see in-game.

The gun was intended to primarily fire HESH, whilst also being fitted with an autoloader. The tank would also be able to fire nuclear rockets as well. The armour for the tank was very all or nothing, with 130mm at the front angled at 60 degrees, when the lower glacis was intended to be 30mm thick. The sides and back were intended to be 25 - 10mm thick over most areas. Ultimately the Caliban remained a concept that was never really required.

A picture of the blueprint

Centurion 5/1 RAAC

The Royal Australian Armoured Corps has existed since 1927, and helped fight across WW2, after the war the Corps was reduced in size, and the core of this was the 1st Armoured Regiment which was armed with Churchill VII tanks, eventually to modernise their fleet, the British started to give Centurion Mk 3 tanks in 1951. 39 of these entered service in the Summer of 1952, and in the 1960s a further 117 (or 143) were given.

After being pulled into the Vietnam war in the 1960s, the 1st Armoured Regiment prepared to modernise their Centurion’s up to the Mk. 5/1 standard, this included strengthening the frontal armour, replacing the BESA Machine gun with a Browning one, installing a floodlight and IR lamp, and installing an additional 100 gallon fuel tank at the rear. These went into combat the same year, and during 1968 some modifications would ensue, including removing the side skirt armour, and replacing the radio with the American PRC25.

The Vietnam war ended in August 1971 and in September, most of the tanks were moved out of the fighting area, and the tanks did not remain in service long after the end of the war.

A picture of the tank

Another picture

Charlemagne

Developed by the School of Tank Technology and Royal College of Military Science in 1958 which presented a medium tank with high crossing capacity and a low silhouette due to the reclined drivers position. The tank also had no obvious weak points on the frontal profile due to there being no driver's hatch or periscopes. The driver could see using mirrors mounted on the sides, and had an escape hatch at the top, which could be blocked by the gun. The tank was intended to mimic the Soviet heavy tanks of the time and feature strong enough armour to compete with them while being lighter (around 30t) and smaller than all currently in-service British vehicles. The tank was intended to have a very well-stabilised 120mm gun with low shell velocity. The gun was also rigidly mounted, which had been tested previously on a Centurion. However, despite this, the tank still managed 10 degrees of depression.

One major downside was the fact that the tank could not fire APDS rounds due to the low shell velocity. The power plant chosen for the vehicle was the Rover Meteorite Mk 202B making around 585 bhp, this was an interim solution until a more powerful and modern engine was developed. This gave the tank a respectable 45 kph top speed. The suspension was HHS, with 6 road wheels either side. Interestingly, the tracks were identical to those used on the Comet. But since this was an STT development, not much was to come of it and the tank never went beyond a model and workbook plans.

The Armour Layout

Chieftain Prototype

The Chieftain originated from a British Leyland design of a new tank from early 1950 when the War Office requested a replacement for the Centurion. The Centurion itself was not seen as ideal in firepower since the arrival of the new Soviet IS-3, and the followup T-10. The British Conqueror heavy was a failed response to these tanks. The tank mounted the brand new L11 120mm main gun, and had new thicker sloped armour to sustain impact by new Soviet HEAT and AT rounds. The tank was also mounted with the new Leyland L60 engine. The first prototype was built in 1959, with a total of 6 being built before more major modifications were performed. After many evolutions it was eventually accepted into service in 1966. The Chieftain Prototype is a fictional mix of various prototypes, including the early wooden mockup of the tank.

Recent Picture of the Prototype
Picture of the Tank During Trials

Chieftain/T95

This project was created in 1957 as a means to establish even more standardization of components. As of this time, the British 105mm L7 and 120mm L1 were already replaceable with the American 105mm T254 and 120mm T123E6 guns. The T95 program was already intended to be a universal program and had a large amount of developments on the go at once, and a part of this featured three projects including the FV4201.

The first of these was to mount the FV4201 turret on the T95 chassis, the second was to use the American T208 90mm gun in the FV4201, and the third was to mount the T95 turret on the FV4201 chassis, which is what this vehicle represents.

It was noted that if the UK were to consider modifying the Chieftain's turret ring with the T95's hull mounting surfaces in mind, then it would be possible to do a complete turret swap. Ultimately though, this project didn't extend beyond blueprints, with particular highlights in the issues of training crews for both vehicles, as well as the potential to require a major redesign of internal components, in addition to overlapping demand for which gun was preferable, it was all too complicated.

A picture from this program (Study G, using the 120mm british gun)

Chimera

Developed by the STT in 1950 to be capable of destroying the IS-3. The designers looked at contemporary designs and realised the Chimera would be weighing at least 55 tonnes. The weight was for a powerful engine, crew space, better ammunition capacity and better gun manoeuvrability. The gun was chosen to be able to hit an IS-3 at a distance of 2000m. It was also supposed to be able to be hit by an IS-3 at 1000m. Would've likely had a top speed of around 50km/h which was not desired. This project was never built because of its weight; however, it ultimately showed how a 120mm gun was necessary throughout the 1950s and this influenced a lot of future designs.

Blueprints of the front of the hull

Turret armour thicknesses

Side profile of the turret

Cobra

Designed in 1954 by the STT at the 7th technical staff course. Its requirements were to design a new medium gun tank with a weight that didn't exceed 35 tonnes and was able to penetrate 150mm flat armour at a distance of 1800m. A 120mm gun was chosen because of kinetic energy, low shell velocity and low recoil while having the energy on impact to be effective. Due to the weight and only 3 crew members, it was decided the commander would not be the loader, so an autoloader was planned. The tank would've been very expensive and overcomplicated, however the weapon would've been very effective. The project was discontinued because the Oscillating turret failed to meet the requirement of working on contaminated ground - the turret needed gaps to oscillate properly.

A picture of the model

Blueprints

Schematics

Armour thicknesses

Cromwell B

For more information, see the Cromwell.

This vehicle was made famous by the 7th Armoured division, who received Cromwells in 1944 when they were prepared to return to the UK to prepare for D-Day. They fought across France into Germany and also took part in the Victory Parade on the 7th of September 1945 in Berlin.

Cromwell's During the 1945 Victory Parade in Berlin

Excalibur

Designed in 1961 by the STT for the 12th design exercise. It called for a machine that weighed less than 30 tonnes, could fit inside a blackburn plane and be fully amphibious. The engineers chose to mount a semi-traversable turret on the front as it allowed for more hull space. A low-pressure 105mm gun was chosen to allow for a small recoil, though it did have low shell velocity. It was never designed to shoot on the move, and the gunner was intended to be the driver. It was never built because it was only a design exercise. However, the ideas in this project were used in the GSOR project series in the years after.

A picture of the model

Turret and gun details

Armour thicknesses

Schematic

Excelsior

The original design for the A33 Excelsior was to produce a "Heavy Assault Tank based on the Cromwell, using thicker armour and redesign suspension". This seemed to be a direct challenge of the Churchill tank, due to its automotive unreliability and poor speed. The A33 goals and requirements mirrored the T14 Heavy, which was US built, these two tanks were aimed to go into trials together, and the one that performed better would be accepted for service and production.

English Electric built two prototypes, with the earliest version built in 1943, it was called A33/1 (or A33/A) and used American horizontal volute suspension and tracks, these were the same found on the T1 Heavy (or M6). This was a stopgap as the UK developed their own bogie-style suspension.

The later prototype did not use widened or strengthened Cromwell suspension, but used a design known as “R.L.-type suspension” (standing for Rolls-Royce and L.M.S Railway) which had a large suspension travel to improve ride quality and cross country mobility. This was very expensive and complicated to produce.

Both A33’s used an altered Meteor engine which was the same as the Cromwell, which output 620hp at 2550 RP. This gave it a top speed of 24.8mph (39.9km/h) and a reverse speed of (2.3 km/h) which was significantly better than the Churchill.

The tank was all welded, with 4.5 inches (114mm) of frontal armour on both the hull and turret front, and the turret sides were 3.5 inches (88.9mm) thick, and the rear was 3 inches (76.2mm) thick. The hull was 2 inches (51mm) thick along the fighting compartment sides, and this was thinner on the sides of the engine compartment, being 1.5 inches (38.1mm) thick. The rear of this tank was also 3 inches (76.2mm) thick. This was considerable protection for the time.

The tank was intended to be armed with the standard 6-pdr, however this was later changed to the 75mm QF Mk V, which was to match the standard armament of the Cromwell at that time. It is said the first prototype mounted the 6-pdr however this is not the case, but both guns were relatively interchangeable with one another. The tank had 10 degrees of gun depression and 20 degrees of elevation, and was able to carry 80 rounds.

During testing the vehicle had some reliability issues with the American T1 suspension, and initially weighing 40 tonnes at the start, by the 800 miles it apparently weighed 42 tonnes (224lbs) of mud had been picked up by the tracks! This apparently had very little effect on the mobility of the vehicle. Generally speaking the ride was apparently very nice.

This said, the project was discontinued because of the Churchill tank’s reliability being improved over time, rendering the need for this vehicle unnecessary, this said there was a later project called the A37 which was a lengthened A33 with additional armour and a 17 pounder gun, which may have resembled the Challenger. Not much is known about this and no drawings exist.

The only surviving prototype of this tank is the A33/2 with the R.L.-type suspension, which survives at Bovington, it is currently off public display. A thing to note, is that the name of this tank is not Excelsior, in November 1943, it was called “Commodore” by English Electric for a few weeks, the general name of this vehicle was just “A33 Heavy” or “A33 Heavy Assault Tank”.

A picture of A33/1 (First Prototype)

A picture of A33/2 (Second prototype)

Armour layout

Schematics

Firefly VC

At approximately 1230 hours on the 8th of August 1944, seven Tiger I tanks of the 101st SS Heavy tank Battalion attacked north along the Route Nationale 158, little did we all know, this engagement would lead to one of the Second World War's greatest mysteries. A mystery in which this tank's story stems from. It was the mystery of who killed Michael Wittmann.

At the time of his death, Wittmann was the top-scoring German tank ace, credited with the destruction of 143 Allied armoured vehicles. Part of his postmortem notoriety was the circumstances surrounding his death, as there was no official indication of who had killed him.

The location of his grave remained unknown until they were found, along with his crews, in 1983. Nevertheless, the mystery still remained.

The most widely accepted story, that of the tank we have in-game, is that Sherman Firefly tanks of the 1st North Hampshire Yeomanry had knocked out Wittmann's tank. While they did knock out 3 German Tiger tanks within a matter of minutes, they were far from the only units to engage the Tigers that day.

Two other major contenders, that were rumored to be engaging tanks that day too, was the 27th Canadian Armoured Regiment, specifically the Sherbrooke Fusilier Regiment, but no written records have survived.

But in terms of our Sherman VC Firefly, was modelled after the 1st Northamptonshire Yeomanry, specifically, Joe Ekins, who was the gunner of the Firefly that engaged German Tiger's on the road near Saint-Aignan-de-Cramesnil and Sento.

And the infamous 'Tiger 007' commanded by Michael Wittmann was there. However, the facts lead further towards the Canadian Fusiliers having knocked the tank out, rather than the British Yeomanry.

Sherman Firefly's of the 1st North Hampshire Yeomanry
Sherman Firefly of the 1st North Hampshire Yeomanry

FV201 (A45)

Origins for this vehicle begin with the A43 Black Prince in 1944 when the decision came to put the Black Prince into production, it was relatively divisive, with some wanting to keep more traditional roles of tanks "Cruiser Tank", "Infantry tank" etc. Some others wanted more multi-purpose designs. A key figure was Raymond Briggs, who could not see a need in the Black Prince, especially since it was so underpowered, he came to the conclusion that if a new "Infantry Tank" should be built, it should be based on the promising A41 Centurion, which was in development at the time.

This culminated in the A45, it's not known when the prototype was built, but it's between 1945 - 1946, it's also unknown who built it, either being English Electric, or DTD. This tank however, did not adopt the Infantry Tank notion, and was instead labelled a Universal Tank, while

Centurion was considered a Heavy Cruiser at the time (Later Medium Tank). The A45 was designed to be able to mount all sorts of equipment to face all sorts of enemies without needing support vehicles.

There were plans to mount a flamethrower, a bulldozer blade and even a heavy APC, as well as being so adaptable to have a whole family of vehicles based on the same chassis. The tank aimed to combine a good enough gun to face whatever it needed, enough armour and enough speed to be where it was needed. This differs from the Centurion which was not intended with this design concept in mind, and would require extensive reworking. The A45 had a built in PTO to help transfer the engine's power to other equipment.

At a similar time, the FV designation system was set in place, this would set out a sequential system of vehicles with a base vehicle class, and then the subsequent vehicles in that family having corresponding numbers, in the case of the A45, it became FV201, part of the FV200 family, with the next vehicle being an AVRE with a 6.5" gun with a winch and dozer. The prototype for this vehicle would be called FV201 P1 (For Prototype 1)

The FV200 series used 8 small steel wheels, somewhat based on the German designs of WW2 with 6 return rollers, this was common among all vehicles. This vehicle had a fifth crew member placed next to the driver, a traditional place to store extra ammunition, he was there to operate additional fittings should there be any, such as machine guns or additional equipment. This didn't hinder the ammunition count much, since it had 74 rounds of ammunition, 9 more than that of the Centurion.

The gun of this vehicle was intended to be the 20-pdr, which was ready in 1945 and was superior to the 17-pdr, this said, the vehicle still had the 17-pdr until the third prototype was built. Initially the vehicle had a Meteor engine, however this would later be updated to a Mk 12 engine.

A key to distinguish between the Caernarvon and the FV201 is the suspension layout, the Caernarvon has 1-2-1, 1-2-1 in its road wheels, whereas the FV201 has 1-2-2-2-1.

By 1949, the FV201 project was cancelled, likely because it was seen to not offer enough armour, combined with the idea to mount a 120mm gun. Thus, work began on the FV214 project, the Conqueror.

A picture of the prototype (Rear Top) (Rear Side)

Provisional sketch

Blueprints (Side perspective)

Another image of FV202

FV215b

This is a fake tank, the hull existed as the FV215b 183 used the same hull configuration, and was a wooden mockup. The turret also existed but was only mounted on the Conqueror (FV214 hull). The turret was never considered to be mounted on the FV215 hull.

The reason for this designation is a bit more complicated. There is an FV215 “A” and FV215 “B”, the FV215A is likely referring to the “FV215b 183”, the B designation comes from a planned AVRE variant of the FV215. This said, even the official documentation has some confusion over the projects. This comes from the 1980s and was written by a volunteer at Bovington, it’s possible he saw the two variants planned and just labelled them as A and B.

FV215b 183

Developed on the Conqueror adaptation of the FV200 chassis, the tank was the same length, but was slightly narrower at 3.6m wide as opposed to 3.99m wide. The weight was 61 tonnes, it was operated with a 5 man crew consisting of the Commander, on the left of the turret, the gunner on the front right, two loaders at the rear of the turret, and the driver at the front of the hull. There were three turret layouts considered, front, middle and rear, ultimately the final one was chosen as it was considered the best to balance the weight. This meant the engine was moved to the centre of the vehicle.

The turret of the tank was to be welded, and had a 2.4m diameter turret ring, the turret would’ve weighed 20 tonnes, the exact thickness of the turret armour is unknown, other than it was intended to “protect from a 100mm gun in a 30-degree arc”.

This gun was nicknamed "Lilywhite", and the initial designation interestingly was for a 180mm gun, however in December 1952, this would be updated to 183mm, and a number of shell types were considered, however only HESH really went under further development.

Records suggest that at least 12 L4 guns were built, it was fully rifled with a bore evacuator in the middle, and weighed 3.75 tonnes. The only ammunition produced for this gun was HESH, and the shell weighed 72.5kg, and measured 76cm long, the propellant case weighed 33kg and measured a further 68cm long. The shell velocity of this tank was 716m/s. When fired, the gun produced 87 tonnes of recoil force, and had a recoil length of 2 1/4 feet (69cm)

The L4 gun was tested against the "Super Conqueror" test bed, as well as a Centurion, in two shots, the HESH shell blew the turret clean off the Centurion, and also split the mantlet of the Conqueror in half.

Between the two loaders, they were able to achieve a rate of fire of around 2 to 2 ½ round per minute, the ammunition stowage was limited to 20 rounds, and 12 of these would’ve been stowed in the turret against the walls.

The tank was intended to have the Rover M120 No.2 Mk.1 engine, which was 12 cylinders and produced 810hp at 2800 rpm. This would’ve given it a top speed of 32km/h (19.8 mph). The power plant separated the driver from the fighting compartment, it was apparently placed 6 inches off the center, but it is not known which side this is. The exhausts were to be mounted

just in front of the turret from the sides of the hull roof, on top of this, a small 4 cylinder engine would also be provided to drive a generator to give electrical power, with or without the main engine running.

The report for this concept was filed by Vickers in 1951, and in June 1954 a contract was signed to produce a vehicle known as “P1”, in March 1955 this would be upped to two Pre-production vehicles. A full scale mockup was completed between July 1955 and January 1957, and a selection of parts were created, the two pre-production vehicles were cancelled by 1956, however work continued on P1 which was to be completed in 1957, however this is where the story ends.

In 1957, with just the gun, a couple of turret faces, and a number of other smaller parts built, the FV215 project was officially canceled. This decision was largely down to the Army. From the outset, the Army was not keen on the concept of the vehicle, mostly due to the fact that large-caliber weapons provide a number of logistical issues. If even the Conqueror was having issues, then there was no doubt this would have too. On top of this, the IS-3 was proving to be a less threatening tank than the Allies had originally imagined, with a lot less being produced than expected.

A picture of the blueprints

A view of the model

Another picture

FV226 Contradictious

As with the line, the tank is fictional. First of all, the designation FV226, it is implicit by this designation that the tank is a part of the FV200 series, alongside the Conqueror (FV214) and Caernarvon (FV221), however - components of these tanks are part of this series as well, and FV226 is actually the rear trackguard storage bin lid...

The tank is clearly based off of the Caernarvon/FV200 hull, just made larger. Other than this there's not much to talk about, other than the "control" rods on the barrels seem to be not only misrepresented but magically repurposed.. It's implied that these are the control pipes/rods for opening the muzzle covers, however it seems these were borrowed from the Green Mace heavy anti-aircraft gun project from the late 1950s, which was actually intended to be a cooling pipe for the gun

FV4202

By the mid-1950s, a need for a new medium tank, even though the Centurion was highly capable, and around this time, the FV201 or Conqueror was also in the works, this is likely due to older memos that suggested the tank would be phased out, and with the failure of the FV4201, it left them in a difficult position.

The FV4201 and FV4202 projects were essentially Chieftain precursors. And learning from these precursors showed a few key ideas. The FVRDE established that the new vehicle should have an internal gun mantlet, a reclined driver position, and the gun was to range between 105mm and 130mm.

While all this was being considered, in 1954, work began on deciding whether the Medium Gun Tank No. 2 (FV4201) could mount a 120mm gun with a breech loaded QF gun as seen in FVRDE report PC23. To test this idea, the weapon would feature a modified QF 20-pdr and be mounted on a new testbed designed by Leyland. This would be designated FV4202.

Leyland built 3 hulls, most of these parts were custom made from unarmoured steel. A few leftovers from older Centurions were also thrown in the mix. The tank did mount the QF 20-pdr, which also had bagged charges rather than solid shells, the first of its kind.

The turret was cast from unarmoured steel of a suitable thickness to that of the FV4201. The engine chosen for the FV4202 was the Rolls Royce Meteorite engine making around 520 bhp at 2700 rpm which gave the tank a respectable 12.4hp/t.

Fully laden, the vehicle weighed 40.8t, which was 5 less than the proposed FV4201. (However its likely due to the use of unarmoured steel). 3 prototypes were built as testbeds, however, the tank was never improved from there as the FV4201 project was given priority, which eventually led to the Chieftain.

Gabler's Destroyer

We have no information regarding this vehicle, I'm led to believe it's some obscure patent design, but that's all.

Gonsalo

There is no mention, in writing or otherwise, of any plans to mount a smaller calibre gun during the development of the Caliban project. As far as we know, even if it was, which it likely wasn't, no blueprints or mentions are known.

The name Gonsalo, and the tank by extension, are likely made up by Wargaming.

While The Conqueror's L1A1 and L1A2 guns were both very powerful, they were quickly outclassed by the 105mm L7 gun, which would have likely outclassed the Gonsalo's 120mm as well.

On top of this, the fact that the Gonsalo's 120mm gun is identical in looks to the Caliban's 152.4 mm gun, further points towards Wargaming making the tank up from thin air.

Caliban blueprints

GSOR 1008

The GSOR 1008, or General Staff Operational Requirement No. 1008, was developed outside the STT between 1961 and 1963. There were 4 designs unveiled using that designation, with all 4 having a two-man crew with an autoloader. Our particular GSOR 1008 is the 1st proposal or scheme 1, which weighed 44t.

There is little information known about any of these 4 concepts. However, we are able to derive some information from the text given and the looks of the proposals. Firstly, as stated above, we know that they were developed between the years of 1961 and 1963 because GSOR 1006 was issued in 1961, and GSOR 1010 was issued in 1963.

Given the fact that it uses swingfire missiles, which were developed in 1961, it has to be at least mid-1961. And it's hydraulic suspension, which was worked on by Sven Berge in 1956. It was also said to use an experimental armour called "liquid armour" which was designed to offer improved protection against shape charge rounds such as HEAT or HESH.

From the looks of the vehicle specifically, we are able to determine that it was designed as a conceptual ambush tank, this is due to the fact that its weight was not seen as an important factor, its low profile, and the fact that none have speed or engine requirements specifically mentioned.

The GSOR 1008 proposal we have in game is also the tallest of the 4 proposals, standing at 7 foot 10 inches, mostly due to its manned turret. This had both the Commander and Driver in the same fighting compartment. The vehicle also featured dual controls, allowing both crew members to individually conduct both tasks.

The GSOR 1008 proposal 1 seems to be equipped with a 105mm High velocity gun, which as mentioned, had a bustle mounted autoloading system which had 16 rounds of ammunition ready to fire, with a further 34 rounds stored in various places in the hull. The shells were of a single piece design of which once fired, were ejected out of a small hatch at the rear of the bustle.

The turret is of an oscillating type, similar to that of the AMX designs by the French. The gun is mounted high to allow connection with the rear autoloader. The vehicle's turret also had an Optical Tracking Acquisition and Radar (OPTAR) rangefinding system installed which uses pulses of infrared light to acquire its target.

The turret was also capable of traversing a full 360 degrees, and had elevation angles of +/- 10 degrees. The armouring on the turret was rather thinly armoured compared to the hull, with 152mm of armour plating which tapered back to 120mm near the top. However, due to the turret being only 1.1 feet high, it was a relatively small target.

The most notable feature of the GSOR 1008 Scheme 1, was the use of liquid armour, which took up the vast majority of the front of the hull, as seen at the front of the picture. This usually consisted of diesel fuel, due to the mix of its low reactivity and high density.

The biggest reason for adoption of this liquid-type armour, was that it was released early on that the penetration depth of a shaped charge was hydrodynamic in nature. This means that the depth of penetration was inversely proportional to the square root of the density of the target material, so, in testing, low-density materials such as sand, glass, and diesel, offered excellent protection against these shaped charges, especially in relative weight to steel. This led to the tank having close to 760mm of shaped charge protection in total.

Suspension and propulsion data is scarce, from what we see visually, it has five road wheels, which are likely on torsion bar suspension, it has a front idler, and a rear driven sprocket. While we dont have any written evidence of the engine or gearbox used, we can speculate that the engine would have likely been a Rover Meteorite Engine.

A picture of the schematic
A picture of the Schematic (Top View)

GSOR 1010 FB

Part of a series beginning in 1961 for a series of air transportable, armoured reconnaissance vehicles. Specifically these would be divided into GSOR 1006, which were support platforms, and the GSOR 1010, which were for recon roles.

The GSOR 1006 plans would feature 105mm calibre guns, as well as missiles, and the GSOR 1010 projects would come with guns no larger than 76mm. These projects would be merged into the GSOR 1010, and the project would be revised in December 1963, becoming the AVR (Armoured Vehicle Reconnaissance)

Our GSOR 1010 specifically represents the summary drawings by the French, this is also denoted by the FB at the end of the name, standing for Franco-British. The French took part in meetings regarding the GSOR 1010, but did not take part in its development. The GSOR 1010 was intended to replace the Saladin. The weight of the vehicle was to be 14 tonnes, and have similar mobility on land comparable to the Ferret. The engine of this vehicle was to be a 300hp Rolls-Royce engine, to allow for a top speed of 90km/h, with deflated tires this top speed would be reduced to 60km/h.

The tank was to feature skid steering, which seems to be a highlight of this design, the suspension of this vehicle would be tested in September 1962 which noted the mobility across terrain to be good, but showed concerns of the longevity of tires.

The crew of this vehicle would’ve been 4 men, with there being 3 in the turret, presumably these would’ve been the Commander, Gunner and Loader, with the Driver in the hull. Protection of this vehicle seemed to only be able to withstand small arms. The gun of this vehicle was identical to the Saladin, being the same 76mm. It is unlikely a 105mm gun would’ve been chosen, since at the time of this vehicle's development, these were for the related (but not the same) GSOR 1006 project.

I believe that these projects were halted due to attention focusing more on tracked AVR’s being the GSOR 3301 in 1964, ultimately leading to the development of the Scorpion.

A picture of the blueprints

Light Mk VI C

Although sharing most of its components, being its hull, tracks, drivetrain, suspension, fittings, armour and armament, with the Mk. V, the Vickers Light Tank Mk. VI, designed in 1935, received a roomier turret, which was extended at the rear, this allowed them to mount the new No. 7 Wireless radio set, which revolutionised squad tactics.

This did have an adverse effect on the vehicle's weight, raising its total to 4,900 kg, which in turn, required a more powerful engine. For this, the Meadows air-cooled Six cylinder petrol engine was chosen, which made 88 hp, and was mounted on the right side of the hull. This was mated with a new Wilson 5-speed pre-selector gearbox, which also had a redesigned engine clutch.

The old Horstmann coil-spring suspension was kept unchanged as mentioned before, as it was found reliable and easy to maintain, although it did pitch quite violently during rough drives, rendering the use of the gun on the move useless. However, the engineers did manage to move the centre of gravity forward, improving the ride.

The crew was a complement of 3 men lodged into the cramped interior, the driver was sitting on the front left, while the commander and gunner stood on a platform that revolved with the turret (turret basket of sorts). Above the turret, towered a round cupola.

The main armament was the same as the Mk. V, using the heavy Vickers calibre .50, which had some armour piercing capabilities against armoured cars and all but the lightest of light tanks, however it struggled greatly against anything with more than 20mm of armour.

The armour protection was unchanged, still capable of stopping small arms and shrapnel, and most light machine guns.

Interestingly, in 1936, when the first prototype passed trials, it was considered by the General Staff to be more superior than any other light tank serving worldwide.

Soon after production began, the newly designated Mk. VIa appeared to have a few major flaws. The return roller, initially over the top of the leading bogie, was displaced to the back and attached to the sides instead. Ground pressure was also decreased from 7.54 psi to 6.9. And the engine was replaced with the more powerful Meadows ESTB.

In 1937, the Mk. VIb started production. It was nearly identical to the Mk. VIa, but had some simplifications in its design to aid in production. For example, the two-piece armoured louver on the radiator was replaced with a one-piece version. And the hexagonal commander's cupola was replaced by a circular cupola, the same version as the prototype.

The turret was also retrofitted for the mounting of a Bren AA gun. The radio set was upgraded to the N.9 wireless radio and the total weight rose by 100 kg to 5 tonnes. Near the end of production, in 1939, a new more compact BESA machine gun was installed as its main armament, with the coaxial machine gun also being upgraded to the BESA.

The armour thickness was raised to 15mm on the front of the turret, and 16mm on the hull. This lowered the tanks power-to-weight ratio to 16.9 hp/ton, and gave it a range of 200km, even with the new Meadows ESTB/B engine.

The Light Tank Mk. VIc was the last wartime variant of the tank, and the model shown in-game. With the most obvious change being the removal of the cupola, replaced by two domed hatches with a commander's periscope. The tank also had wider bogie wheels and tracks, which slightly lowered ground pressure.

The tanks Meadows ETSB/B engine was given a third carburetor, which improved fuel efficiency and performance. The top speed however, stayed stagnant, at 35 mph on road and 25 mph off-road due to the increased weight from the added armour in the previous model.

The Mk. VIc was equipped with a second BESA machine gun as a main armament, while it retained its coaxial BESA.

The Light Tank Mk. VI was mostly intended for reconnaissance and colonial warfare, and many were sent abroad for such a purpose. The cheapness of the tank made it by far one of the most numerous tanks used by the British when the war started, with approximately 1,000 in service.

Wartime operations proved absolutely devastating against equally fast and much better armed tanks such as the Pz. II and Pz. 38(t)'s. Of around 400 tanks sent to fight in the Battle of France, only 6 made it out.
This left mainland Britain devoid of any sort of armour when the Battle of Britain began. However, they showed their better side in the early days of the North African campaign, where 200 Mk. VI's formed the backbone of British armour together with 75 Cruisers and 45 Matildas. Despite its feeble protection, they performed well against the lightly armoured Italian tankettes. Particularly when used to outflank the retreating Italians.

The British lost many tanks, however they retained most of their forces until February 1941. This is when the number of Mk. VI's in service started to dwindle due to the arrival of the Afrika Corps. Despite this, they soldiered on until 1942, where many were sent to Greece, Crete, and Malta to assist against incursions.

During the Siege of Tobruk, the 1st Royal Tank Regiment had only 16 Mk. VI's but they managed to move them daily, giving the Germans the impression of a much larger force. By mid-1942, the remaining Mk. VI's had been withdrawn and were mostly used as mobile observation posts and local AA defense. They were completely replaced by the American M3 Stuart.

During their production run of 1936 to 1940, a total of 1,682 vehicles of all variants were built, with 130 being the Vickers Light Mk.VIc we see in game. The majority of these were likely lost in combat due to its lack of armour and relative mobility to similar vehicles.

Vickers Light Mk.VIa
Vickers Light Mk.VIb Vickers Light Mk.VIc

Matilda BP

For more in for on the Matilda II, see this

Later in the war, likely late 1944, early 1945, an experimental upgrade was conducted on the feasibility of mounting a 6-pdr to the Matilda. However, as we all know the Matilda II was cursed by having such a small hull that it could not fit a larger turret, which in turn, meant it couldn't mount the 6-pdr.

To remedy this, the designers pulled the turret from the A27M Cruiser Mk. VIII Cromwell and tried retrofitting it onto the Hull of the Matilda. This unique looking amalgamation das designated as “Infantry Tank Mk. II Matilda II with A27 Turret”.

The main problem to overcome was that the Cromwell had a 57 inch turret ring diameter, while the Matilda II’s turret ring was only 54 inches. This led to the designers placing a sort of superimposed turret ring on the top of the hull.

However, as you would expect, the design was quite flawed. As the hull was heavily modified to fit the enlarged turret, the new gun and ammunition would also have increased the weight by around 20%. Though modified hulls were produced, only one prototype was fully constructed.

The other hulls were mostly sent to Australia and were fitted with normal turrets and guns.

Unfortunately, no documentation can be found on this tank due to all the paperwork on the Matilda being burned when Vulcan Foundry, the parent company behind the Matilda design, was shuttered in 1962.

As stated above, the name of this tank, being ‘Matilda Black Prince’ in-game, is incorrect. The Matilda Black Prince was a real project however, to do with radio-controlling tanks. The historical name for this vehicle was as specified earlier, though it can be shortened to just Matilda II with A27 Turret.

Matilda II with A27 Turret

Matilda LVT

Outside of the in-game description, there is very little information known about this project. There is no evidence to suggest that this tank exists however it could be based on the Valentine LVT, which was a real conversion

Here is another, more likely inspiration for the Matilda LVT, found in Australia. Its a Matilda II with the turret from the LVT(A)5, but has a fake mantlet, gun and a cupola from an M113 Picture 1,2

Nemesis

The Nemesis MBT, which was named after the Greek goddess of divine retribution, was a 59 week project carried out mostly by British Officers from the RAC as well as infantry officers and some US and Commonwealth soldiers.

The task given was to develop a non-European main battle tank. At this time, many of the newest tanks were designed for the European market, built to face off against superior numbers of Soviet tanks, and as a result, were often heavier, more complex, and more costly than was required elsewhere.

Therefore, there was a large number of non-European nations that requested a high-quality tank, but did not need them to meet the specialised requirements of the European theatre. Any tank designed here would need to have a wide appeal for large volumes of customers to allow production at a reasonable price.

Nine officers were chosen to design the tank using knowledge gained over their previous years as well as support from a wide variety of industrial leads including Vickers, Rolls Royce, and MVEE along with armour specialists from the UK, Germany, and many other nations.

The first step was an assessment of the current nations who might be interested in the tank, what threats they faced, terrain types, political ramifications and how their neighbors would likely react, the nations' previous relationships and their financial stability were also taken into consideration.

The next step was to see what each nation actually wanted, assigning a scale of importance averaged over each nation. The top requirements were for a low-cost vehicle, capable of defeating both Soviet steel but also American armour. The need for night fighting equipment was high in priority, while medium armour was also more favourable than heavy armour.

For medium importance, the engine requirements were mixed, however the ability to eliminate insurgents or light anti-tank weapons were present. In total, over 60 nations were assessed and the requirements were calculated using averages.

The team also had to evaluate the type of war these nations would likely use the tanks in. The most desired of which was for mobility, offensive roles in a conventional war, close fire support for infantry, and anti-armour defense against superior forces. The vehicle was required to be effective out to 2,000 metres, and do so after a long-distance march in harsh conditions.

The team also worked out the cost people are willing to pay. They excluded Soviet and Chinese vehicles for this, as one was never going to produce a better tank at a price less than that of a T-55.

With this, the vehicles chosen for comparison were the French AMX-30 at £225,000, the Swedish S-Tank at £217,000, the British Chieftain at £200,000, the British Vickers Medium at £103,000, and the American M60 at £72,000.

The team also looked at current British vehicles that could be converted to this new role. With the trusty old Centurion being chosen at first, but later deemed not suitable as it only had an estimated service life of 10 years, even with the Vickers overhaul.

The weight of 50 tons, at the time, could not be reduced without sacrificing too much, and the power to weight ratio of 13:1 was not desirable either. To bring the Centurion up to scruff would effectively make it unsuitable in several areas to the majority of customers, defeating the purpose entirely.

On the other hand, the Chieftain was deemed too expensive, losing about 60% of the nations that would want to or could buy the tank. Its weight lost a further 30% of possible customers, while its low power-to-weight ratio further hindered its chances. The idea of giving it a more powerful engine would require a complete rework of the driveline, adding more costs, and using cheap components would just waste under-armour value.

The Vickers Medium Mk. I had the most desirable basic traits, with medium armour, good power-to-weight, and being affordable. It's also proven to work in hot and humid climates, however its mediocre mobility was a pretty hefty downside.

With that said, the team listed what the customers wanted overall which would be used as the official requirements to design their tank.

Those requirements would be a high degree of reliability, ease of replacement parts with minimal crew servicing, a gun capable of defeating a T-62 out to between 1,500 and 2,000 metres, HE and canister capability, as well as the highest possible accuracy.

Protection of the Nemesis was to be enough to stop a T-62’s main gun from 1,500 metres, sides that could stop a heavy MG and small arms fire, and a roof which was resistant to artillery shrapnel and HE bursts. The vehicle was also ideally to weigh under 40 tons, 34 if possible, and have a power-to-weight ratio of 25:1 and a top speed of 65 kph. And finally, come in at under £150,000, including spares for the next 5 years.
With those requirements set in stone, the team began work on Project Nemesis. They looked at the main armament and debated over a gun or an Anti-Tank Guided Missile system, which were quite popular at the time, but since the vehicle had to engage tanks, light armour, and infantry, a guided weapon system was not an option.

The gun/missile system used on the American M551 Sheridan was considered but quickly dropped, as it would not only take up more volume with less ammunition, but it added a layer of complexity and cost that was unnecessary. That said, a conventional High-Velocity gun was required.

The team also debated over if the tank was to be turreted or casemate. A turretless tank had a few advantages, being less weight, and use as a tank destroyer in open terrain, but on the other hand, it was completely useless in urban combat environments and jungle conditions, which customers would likely need it for. The other debate was if it should use a pod-style gun, which was fashionable at the time, or a conventional turret.

The pod gun had the advantage of reduced silhouette and a lighter build and better crew protection, but suffered from poor 360 degree visibility and vulnerable ammunition.

Oscillating turrets were also considered. Being constructed from two halves, which ended with a smaller turret ring diameter, and were best suited for autoloading designs. This meant that they had a lower silhouette while hull down, but were difficult to seal for NBC systems and required more power for the stabilisation systems.

The last odd turret design that was considered was a cleft turret. Cleft turrets are very interesting, with the turret split in half by the gun. This offers a very low silhouette in hull-down positions, and a low weight, but creates vision and loading issues.

A list of potential guns were drawn up, these were the 76mm ARMD L5A1, the 105mm L7A1, the 110mm Short gun, and the 120mm L11A3.

The gun chosen was the 100mm Short gun, this is because it had better performance than the L7A1, while not being overkill like the 120mm L11A3. This would be fitted with a basic hydropneumatic recoil system, and have 10 degrees of depression, and 20 degrees of elevation. Ammunition capacity was 28 rounds of APDS, 12 rounds of HEAT, and 2 rounds of smoke.

The gun was fully stabilised for accurate firing on the move, however rangefinding was an issue. The team agreed that a .50 calibre ranging machine gun was to be used, as it was the cheapest option.

However, some customers would like a laser rangefinding system, so provisions to fit and mount one would come as standard. Later, the team dropped the .50 calibre when they fitted an autocannon coaxial to the main gun for anti-personnel and light anti-armour work.

The coaxial autocannon was the 25mm TRW-6425 cannon, which was under consideration for the Bushmaster program. With this, the Nemesis could engage light armour, infantry, and range its main gun all within a single package.

After the armaments and turret was chosen, the next step was the protection layout. Various ideas were brought up, including ceramic, dual hardness, and liquid armour, like that on the GSOR 1008 project. However, all were either expensive, prohibited, or too complex for many customers. In the end, dual steel and aluminium was used in its armour construction, with the front being steel and the rear being aluminium. The two ends were welded together with controlled explosives, much of which had been proposed for the MBT-80 project.

The front glacis plate was 94mm thick but angled steeply at 70 degrees, giving it an effective thickness of 274mm. The lower nose was 177mm angled at 45 degrees, while the sides of the upper hull were 100mm thick, tapering down to 40mm on the lower sides of the hull. The rear was 89mm thick aluminium plate. The turret was well protected, with armour thicknesses ranging from 339mm to 79mm.

Finally, the team got around to choosing an engine and suspension system. The Nemesis was required to have a road speed of 40 mph, with fast acceleration, good cross-country performance and reliability.

With that, the idea of a conventional petrol engine was very quickly dropped, leaving diesel and gas turbines as the only options. Diesel engines from MTU, Rolls-Royce, and Caterpillar were suggested and the Lycoming 1500 and Rolls-Royce twin turbines were also brought up.

However, the gas turbines were also quickly dropped due to the high fuel requirements, and the price of said fuel. This is fine for the American military, but less desirable for smaller nations with limited logistical strength.

In the end, the German MTU 870 multi-fuel engine was chosen, thanks to its high power output, build quality, and ease of maintenance made it the perfect choice. This was also coupled with an epicyclic gearbox and torque converter.

Unfortunately, the Nemesis was never built, remaining a study and concept, and since the papers were downgraded from secret to confidential in 1984, we are able to view both the workbook and the scale concept which are currently at Bovington.

Pictures of the Model (1, 2)
Nemesis Armour Layout (Side View, Top View)

Nergal

Developed in 1950 by the STT, the name for this was “Project Minotaur”. This vehicle was to use a 180mm gun codenamed “Lilywhite” looking at vehicles for casemated or limited-traverse tanks. There were around 6 known turreted configurations, one with a forward turret and the rest were all rear mounted. The tank was to feature the same road wheels as the FV200 series. The mobility of this vehicle was compared to the Tortoise, which was a similar weight. Minotaur would’ve used a Rolls Royce Meteorite engine, or alternatively a Gas Turbine. The maximum top speed of the Minotaur was estimated to be 25mph.

It was noted that the turreted and rear gun tanks had 5-degrees of gun depression over the engine compartment, it was only noted that the front gun layout “may be lower”, it is known that the Front variant was 47ft long, and that the tank would not be able to negotiate a 90 degree corner in a built-up area, unless the roads were 30 - 40ft wide. After 6 months it was concluded that the rear-turreted layout would be the best suited for this vehicle. It is known that the vehicle would’ve had a crew of 5.

Sadly, no pictures of the rear-turreted or casemate variants exist, there were around 700 drawings made for the Minotaur, and all were disposed of. The rear turreted variants are confirmed to exist in writing. The only images that exist are of the wooden scale model of a front turreted variant that is similar *but not a part of the same project.*

A picture of the model (Front, Side)

Another image

Side view with turret facing the rear

Senlac

Outside of the in-game description, I have been unable to find any information on this tank outside of a blueprint. In my opinion, I think this is a design that originates after the GSOR 3301 project, which dates it to around 1964/1965, on the idea that the Setter came after

A picture of the blueprint

Sexton I

With fresh experience of fighting in North Africa, the British Army worked to find a way to carry their 25-pdr field howitzer onto the battlefield, this led to the Bishop self-propelled howitzer, however few were made due to the availability of the American M7 Priest.

Unfortunately, the Priest used the American 105mm howitzer which caused major issues for the ordnance department. This led to the Americans working to devise a tracked carrier for the QF 25-pdr using the M3 Lee chassis, these prototypes suffered many problems and massive delays during trials, which led the British to look towards Canada.

Thus, the Canadian Army Engineering Design Branch was asked to build a similar vehicle to the M7 Priest but on their Ram Chassis. This work was assigned to the Montreal Locomotive Works, who used the M7 Priest as a major inspiration factor in the design.

A prototype was completed on the 23rd of June 1942 and was tested by the Canadian Army who ordered 125 vehicles in three batches. A prototype was then shipped to Great Britain for evaluation at the beginning of 1943, and was soon approved in March 1943 for mass production under the name Sexton.

Indeed, the Sexton was similar to the M7 Priest in many aspects, the lighter howitzer had +40 elevation and -9 depression which allowed the gun to be used in direct-fire roles, however it was rarely used in this manner. The howitzer also boasted 25 degrees of left and 15 degrees of right traverse.

Due to its role, the armour was kept to a minimum, with 32mm of frontal plate armour with an open top superstructure for better ventilation. The sides and rear plates were just enough to protect against small arms and fragmentation.

The chassis was very similar to the Ram, with three double bogies and a rear drive sprocket. The Sexton was powered by a COntinental R-975 9-cyl radial engine making around 400hp. Later a Mk II appeared which was based on the Grizzly chassis, changes to the driveline, bogies, storage, and fighting compartment were made.

The Mk. I Sexton based on the Ram Chassis was only ever used by the Canadian Army, while the later Sexton Mk. II which was based on the Grizzly chassis was used by the British. Around

2,026 vehicles were ordered and produced between early 1944 and early 1945, making the grand total (including prototypes and Mk I's) around 2,150 vehicles.

T95/FV4201 Chieftain

The FV4201 Chieftain was developed with interchangeability with the US T95 Medium tank project in mind. This would be done by exchanging either the guns or the turrets. This project was discontinued due to the training requirements for each crew. As the name suggests, this uses the T95 Medium tank's hull, with the turret of the Chieftain and the same 120mm smoothbore cannon.

A picture of the blueprint (Of the T95 hull with Chieftain gun)

Another picture

FV4201

Tog II*

The so-called "TOG II" was the second design to come out of the Special Vehicles Development Committee, nicknamed "The Old Gang" as it was made up mainly of people who had worked on the original British tanks in the First World War.

The TOG II was similar to the TOG I and kept many of its features. However, instead of the track path arrangement of the TOG I, which ran over the top of the hull like the Mark IV's, the track pathing was lower on the return run, and the doors were above the tracks.

Ordered in 1940, the TOG II was built by Foster's of Lincoln, and the prototype was finished in March 1941. A few months later, in April 1941, an enquiry was made by the Deputy Director-General of Tanks and Transport to the English Electric Company to ask if they could produce 100. Later in June 1941, another enquiry by the Minister of Supply asked for 50. However, neither of these lead to production orders.

The initial design called for a 6-pdr gun and side sponsons. For "initial trials" it was fitted with a mock turret with dummy guns, it had a 2-pdr gun, a 3-inch howitzer and a BESA machine gun fitted to one sponson, and a QF 3-pdr 16 CWT AT gun fitted to the other, with another 3-inch howitzer in the hull.

However, the two sponsons were never officially fitted. The tank was instead, in May 1941, it was decided that the tank be fitted with a monstrously powerful 28-pdr gun, which was derived from the QF 3.7-inch AA Gun, but with the breech and muzzle brake from the Ordnance QF 17-pdr. This required a massive 72 inch turret ring, which is what spurred the new design which became the TOG II*.

Although equipped with the same electric drive as the TOG I, the TOG II used twin generators with no problems being reported. Among other things, it was modified to include torsion bar suspension rather than an unsprung track design.

The tank successfully completed trials in May of 1943, however, no further development occurred, although a revised version, the TOG II R was proposed, which would have been 6 feet shorter.

Although lighter than its predecessor, it still weighed a humongous 69 tons, paired with its Paxman-Ricardo 12 cylinder diesel engine, it was able to trundle across terrain at a measly top speed of 9 mph.

A single TOG II prototype with the TOG II* configuration (no sponsons) can be seen at the Bovington Tank Museum where it has been sitting since the 1950s.

The TOG II*

TOG II R Blueprints

Proof of the TOG's weight (1,2)

Tog II turret blueprints

Turtle I

An assault tank that was designed in 1943, it was a student project proposed at the STT in that same year. It didn't go beyond paper and is a generally mysterious project.

A picture of the blueprints

Valiant

Development of this vehicle started in August 1942, when Vickers were awarded a contract to produce three pilot models of a "heavy assault tank" by the Ministry of Supply. This was following a succession of meetings from the Tank Board to improve the Valentine. This design was classed as Urgent, and also had a specific emphasis to implement side skirt plates in this design. This said, despite the idea to be a successor to the Valentine, the origins of the Valiant come from the Vanguard.

The Vanguard was a proposed replacement by Vickers for the early models of the Valentine which used unique suspension, somewhat in common with the Valentine. This consisted of the independently sprung pairs of road wheels, and external wishbones. This had been used in the first trials of the QF 17 Pounder AT gun which became the Archer.

The A38 "Valiant" would be referred to as Vanguard for its first few months of development, and weighed 23 tonnes, which was lighter than the Excelsior and Churchill that were in development of the time, and the turret for the vehicle would be 2-man as opposed to the 3-man of the Vanguard.

The design was mounted with the 6-pdr gun, and it offered very impressive protection for the time, with 114mm thick frontal armour, and 102mm thick side armour. The tank also featured a pike-nose which was to give greater armour obliquity angles. The turret loosely resembled the Valentine Mk X turret, and could carry 55 rounds. Mobility of this tank was a top speed of 16mph (25.75 km/h), using a 400hp Rolls Royce Meteorite engine.

Unfortunately, when entering prototype phase, the contract requested 6 vehicles be made, using either the AEC A189 (135hp) or a 138hp engine by General Motors. Eventually, it was decided that Vickers would not be continuing development of the Valiant, the Tank Board declared the bulk of their workload should be spent continuing existing tank production. It was agreed that Rolls-Royce would be responsible for developing the engine and transmission compartment, this is where the alterations began to go downhill for the tank. The original ground clearance was 43cm at the rear, however this was reduced down to a mere 25cm. Two months after being given to Rolls Royce, the Ministry of Supply declared that Ruston & Hornsby would be taking over the project; they had little to no experience developing armoured vehicles, other than producing the Matilda II.

They designed a larger turret, to be 3-man again, and also created a new bulge in the front for the driver to sit in among a few other modifications. A single prototype would be produced and entered trials. The suspension seemed to be very unreliable, particularly cross-country, it was noted that the vehicle was at fault in so many ways it would be unsafe, as well as naming the suspension system to be “utterly valueless”. The driver was considered most at risk.

The prototype was ultimately rejected, and was retained by the School of Tank Technology, while at school students were invited to point out as many flaws as they could with the design. It still survives to this day.

Original blueprints by Vickers (Effectively the Vanguard)

The scale model

Engine bay modification by Rolls-Royce

A picture of the tank

Vickers Mark 3

In 1974, Vickers pressed on with development of the Vickers MBT Mk. III. This version stems from the Design No. 51400 T and differs from the Mk. I mainly by having a turret with a well-shaped cast front which was welded to a fabricated armour plate body.

The Mk. III also had a cast gun mantlet which was better shaped from the point of view of its resistance to armour piercing projectiles then the flat mantlet of the Mk. I.

The Mk. III has various other improvements, such as an increase in the gun depression from -7 degrees to -10 degrees, and the ammunition capacity was increased from 44 rounds to 50.

The first production order for the Mk. III was placed in 1977 by the Government of Kenya, where Vickers was given £100 million for production of 76 Mk. III MBT's and 7 Mk. III ARV/ARRV's, of which were built at the VIckers Scotswood factory in Newcastle between 1977 and 1981.

In 1981, after negotiations, Vickers signed a £115 million contract to provide 108 Mk. IIIN's, 15 Mk. III AVLB's, and 18 Mk. III ARV/ARRV's to the Nigerian Army.

In 1990, Nigeria ordered 64 at the cost of around £282 million.

The Mk. III retains most of the proposed features of the Mk. II. Others were provision for infrared/visible searchlights and the abandonment of flotation gear. A laser rangefinder, which was the same as fitted to the Chieftains, was also proposed since the range of the L7 105mm would be well beyond that of the 12.7mm ranging gun fitted.

Some thought was given to the mounting of the heavier British L11 120mm gun, however this was abandoned due to the 105mm L7 becoming the NATO standard, and on top of that, 120mm ammunition was also more expensive, and the gun would lower the power-to-weight of the tank.

The Vickers Mk. III was powered by a General Motors Detroit-Diesel 12V-71T two-stroke engine which developed 720 bhp, while a Rolls-Royce CV12 TCA developing 800 bhp was also offered as an option. The suspension was torsion bar, with smaller secondary torsion bars at wheel stations 1, 2, and 6.

In total, around 226 Vickers MBT Mk. III tanks were built with some still being in service today.

A picture of the tank

Collectors Vehicles

Alecto

In June 1941, plans for a small light cruiser tank were designed by Vickers. This was designated “A45 Light Cruiser Tank” of which later became the Harry Hopkins. However, problems with the prototype layout caused problems in manufacturing. During the war, a third requirement for a 95mm close support howitzer that could be deployed with airborne troops, had a very low profile, and could change direction at speed was issued, and this hull was the best choice, of which Vickers started to design the vehicle.

Later, on the 20th of November 1942, work began on this prototype SPH under the designation 95mm SP Mounting. As stated in the name, the primary weapon was the 95mm Howitzer, which was actually closer to 94. The gun was to be mounted to a centre pivot on the hull, with 26 degrees of elevation, capable of indirect fire to 6,000 yards. The tank also had 5 degrees of depression, and 15 degrees of horizontal traverse on both sides. The engine mounted was the Meadows Hop 2, 12-cyl 150 hp engine. Allowing the tank to in theory, reach 30 mph.

Work began in 1942, however, much like the Harry Hopkins, progress was slow. And as the war continued on, the need for such a vehicle began to drop, and it was recommended on the 27th of May 1944, that the order be dropped to 800 vehicles. Even though they recommended this vehicle be given priority over the Harry Hopkins in every case.
In 1944, the designation was changed to Alecto 1, this interesting name came from greek antiquity. Coming from one of the three Furies. Which was later changed again to “AFV Tracked Close Support Alecto 1”. Initially, the crew consisted of 5 men in interesting positions, the driver was located in the middle, behind the gun, in a semi-raised cockpit. The Commander, Gunner and two loaders sat on foldable seats in the front.

The tank technically mounted three different guns, with the first being a mash up of three different guns, this first weapon, was a 95mm howitzer, but it had a barrel from a 3.7 inch AA gun, the breech mechanism was from the Ordnance QF 25-pdr howitzer, and the recoil mechanism was from the Ordnance QF 6-pdr AT gun. The second armament being the Ordnance QF 95mm Infantry Howitzer which had a modified recuperator. This second armament, initially intended for infantry use, was not well received due to several faults.

There was never a 32-pdr version of this vehicle, often touted as the Mk. IV Alecto, however, the third version was a 6-pdr gun, on which work began in November 1944 with the 5th pilot hull converted over and sent for testing. Meanwhile, the first few 95mm versions were ready and sent off for testing as well, and by December 1945, 65 vehicles were recorded as being delivered.

During testing, several modifications were made. Shock absorbers were added to the front and rear road wheels for better ride, a drivers screen was added to prevent mud from splashing the driver, one crew member was dropped, making it a four man crew. And a radio was added, which was deemed essential as the Alecto’s were decided to become reconnaissance units.

By this point, the war was over in Germany, and roles started to turn towards the far east, which

made the Alecto's undergo amphibious modifications, which involved large screens being added with suitable waterproofing. Trials were done in two locations and the vehicle proved sufficient. The vehicle also came with a large canvas screen to cover the crew compartment.

As far as we know, three other variants were tested. One with its tracks and suspension removed and replaced with wheels, it appears to be a dynamometer. The second variant, was given a new suspension system with double bogeys between the first and last road wheels. And the last was converted to become a command tank to work with the other Alecto's. It had its gun removed, and was enclosed by sheet metal armour, and had additional radio's fitted.

By late 1945, early 1946, it was decided by the Tank Board, that the Alecto's weren't really needed at all, which led to the halting of production after 90 were built. This was likely due to the changing makeup of warfare and new technology proving to be more reliable than early 1940's tech.

Blueprints

Archer

Developed on the basis of the Valentine in 1942 after the 17-pdr gun was requested to be mounted on a chassis to be mechanised. Initially using the Cromwell chassis for SPG's was considered the highest priority, however the Valentine was also considered.

Vickers Armstrong would be tasked with developing this vehicle in early 1943, and the official name was the Valentine 17-pounder SP. The vehicle was presented to the British artillery command on May 24th 1943.

The task of mounting this gun was no easy feat, and even the Cromwell chassis would be lengthened (resulting in the Challenger/Avenger), the Valentine was much shorter than the Cromwell, so the engineers discarded the traditional SPG concept, and mounted the gun backwards. Despite this solving the problem of mounting the gun, it had its own flaws, the most severe being the gun could not fire on the move, because the breech would go through the Drivers head, the tank also had to have its back to the enemy to engage them.

Despite being very low profile, the tank was able to have a full crew of 4 men, and have 39 rounds of ammunition. The hull was also altered from the original Valentine, having significantly thinner armour, being 20 - 25mm all round, as opposed to the original 60mm protection. The tank would weigh a total of 15.2 tonnes and had sufficient mobility for the time as well.

Trials were done between May 24th and June 7th 1943, and the tank had a gun traverse arc of 45 degrees, gun depression and elevation angles of -7.5/+15, and a top speed of 33.5kph which was faster than the Valentine, but slower than desired.

Despite nearly being rejected due to not having a turret among other flaws, the tank would have 800 units ordered, and a total of 665 would be produced by Summer 1945, since there was no need to spend more money to fulfil the rest of the order. It's worth noting that the Archer was an entirely new build, these were not converted tanks. The tank was known as the SP 17-PR

Valentine, which is referenced in official documentation and even the user's manual. The Archer name appears to come from towards the end of the war, or after. It is not known when.

A picture of the blueprints

Cutaway diagram

A picture of the prototype

Production Archer

Birch Gun

After WW1, spending on defence was cut drastically in Britain, however, despite this work to perfect existing vehicles didn't stop. One of the directions which British Engineers developed was mechanisation of artillery, The Great War showed that the army needed tractors capable of transporting artillery quickly onto the fields, but wheeled tractors were unsuited while most tracked tractors of the day were too slow.

This led two relatively new players to face off for this position. Vickers began working on the 18-pdr Transporter, and Sir W.G. Armstrong Whitworth & Co. designed a vehicle named “Dragon”. The concepts were quite similar, the howitzer was rolled into the transporter, and the crew sat inside. Both prototypes were ready in 1922. Interestingly, further work on the 18-pdr Transporter led to the creation of the Light Tank Mk I, which led to the Medium Tank Mk. I.

As for the dragon, its development took a different path. The designers rejected the idea of rolling the gun into the vehicle. And after the unification of Vickers and Armstrong, becoming Vickers-Armstrong, the vehicle was mass produced and even saw battle. The Dragon family evolved into many forms, one of which turned into an SPG.

In 1924, Vickers Armstrong developed the Light Artillery Transporter, using elements off the Dragon Mk. II. The tank mounted a modernised 76.2mm QF 13-pdr 9 CWT AA gun. The gun was installed into the front half of the turret. The tank also mounted a 48 hp AEC engine. The tank was small, cheap, and much quicker than its equivalent towed. However, this design concept meant it had no armour to speak of, and for this to be used as a direct fire SPG was made. So it was rejected.

So later, in 1923, Sir Hames Drederick Noel Birch was appointed Master General of the Ordnance. As a former cavalryman, he was very closely involved with issues of artillery during WW1 and had hands-on experience with the problems of mechanising them. A few years before, in 1921. Vickers received an order to develop a tracked SPG. But work only began just after Birch took his post. This new prototype SPG was called the “Birch Gun”. It had 13 road wheels per side, with 5 return rollers. And was designed as a universal SPG, not a direct-fire SPG.

Unlike the original 18-pdr, this modified version was capable of firing at aircraft and ground targets. The only part of the new gun was the barrel. Many say that the hull used was from the Medium Mk. II, however, if it was, the hull was drastically changed, since the requirements

called for 360 degrees of horizontal traverse, the hull was reduced significantly. And the fighting compartment was also reduced significantly due to the lack of a turret. The gun, unlike the Light Artillery Transporter, was positioned in the mid section of the hull.

In 1925, the experimental Birch Gun entered trials with the 28th Field Battery of the IX Field Brigate of the Royal Artillery and a list of improvements was made as a result. However, the greatest concern was the lack of armour. They did not ask for a complete enclosure, but they did ask for a gun shield. The use of side skirts to protect the suspension, like on the Medium Tank Mk. II was also suggested strongly.

In September 1925, Vickers received an order for four 18-pdr SPG's, of which they were ready in about a year. Weighing 12t, the tank only had a maximum of 5mm of armour. These production models were slightly different to the first experimental version of the Birch Gun, they had modernised suspension, and newer track links. They also had better designed skirts. As asked for during trials, a larger gun shield was placed to cover the crew from frontal attacks.

Interestingly during exercises with the vehicle, it had no equals on the battlefield in terms of manoeuvrability. It just skipped over the terrain unlike the Burford Kegresse tractors. Unfortunately, it wasn't all sunshine and rainbows, despite designers working to reduce the overall height of the vehicle, the centre of gravity was quite high, which caused a great deal of recoil when firing. The request to make the SPG universal also backfired, the armour was still inadequate for fighting round targets, and due to the 360 degree of rotation, the crew was completely unprotected if the gun was traversed to the side.

After this, the SPG went on to be developed further until conservatives forced the shutdown of work on self propelled artillery, which became a massive blunder as WW2 rolled around. Causing the same mistakes to be repeated, all of which could have been avoided if the Birch Gun project was continued throughout the 1920s and 30s. Despite all of this, the SPG was still not as good as foreign SPG's, with the best being those based on American Tanks. In total, 7 prototypes were built between 1923 and 1927.

Picture of the Final variant of the Birch Gun

Churchill GC

Developed after the General Staff requested an investigation into mounting a high-velocity or powerful gun onto tanks, the Valentine and Churchill were ill-suited to mounting anything larger than a 6-Pdr (57mm) or 75mm gun into their turret, as such it was proposed to mount a cannon into a superstructure. The Churchill Gun Carrier was created as a result. The official name of this was the Gun Carrier, 3-inch Mk 1, Churchill (A.22D).

The tank was built onto an unchanged Churchill chassis, it's unknown which exactly, but it was likely a Mk III. It retained the engine and drivetrain, the front of the hull and the turret were replaced with an 88mm thick box case-mate, and the machine gun in the bow was also removed. The tank mounted the QF 3 Inch 20 cwt anti-aircraft gun, this was already obsolete and was used in WWI. Vauxhall was given 100 guns when given the task of constructing the tank. The gun could fire a 5.7kg shell at 760m/s. The gun could also depress -10 degrees and elevate 15.

50 Pilot vehicles were built and ready for testing in early 1942, and tests continued into 1943 where the tank was found to be satisfactory. By this time though, the more powerful 17-pdr gun was in large-scale development, and was being mounted in the Challenger, Archer and Achilles, these tanks had much better mobility at the expense of armour. The production of the QF 75mm gun for the Churchill had also begun, thus eliminating the requirement for the Churchill GC

No Gun Carrier vehicles ever saw active service or combat, however the Heavy Assault Tank idea did carry onto the A39 Tortoise development. No Churchill GC's remain in an intact or running condition.

A picture of the tank

A sketch of the internal layout

Firefly

The main British tank gun at the start of WWII was the, at the time, incredibly effective Ordnance QF 2-pdr gun. This gun was perfectly fine against early war German and Italian tanks, however, with enemy vehicles such as the Pz. III and early Pz. IV's in North Africa, the gun struggled to penetrate their armour at the average engagement distances in the desert.

At first, this extra armour came in the way of addon appliqué armour plates that would fall off within one or two shots. However, with the introduction of 50mm monolithic armour, the small 2-pdr was only able to penetrate this at point blank range. The need for a more powerful tank guns was then discussed in meetings as early as summer of 1941.

The arrival of the M3 Lee/Grant tanks, which had a hull mounted 75mm Gun M2, helped with this problem for a while. The American gun was deemed sufficient for interim measures until the arrival of higher quantities of the new Ordnance QF 6-pdr gun and the towed Ordnance QF 17-pdr gun. At this point, the 17-pdr was still too big to fit into any tank turrets.

Meanwhile, the enemy continued to improve their armour and armaments, and as soon as the Tiger tank hit the battlefield, preliminary inspections were conducted to find its weaknesses. It was found to be most vulnerable to high velocity Anti-tank guns in the 3-inch class.

The Americans already had a motorised vehicle within this class, with the 76mm GMC M10. But the British 17-pdr was still only available in a towed format. Towed guns were incredibly effective against Tiger's, however they were soft targets, being as vulnerable to the Tiger as the Tiger is to it.

However, it proved difficult to design and built a turret capable of mounting the 17-pdr on British vehicles currently in service. Most had a turret that was unable to be built large enough with enough armour to keep the vehicles original role, or the hull was too small and could not possibly mount a larger turret.

British engineers came up with an easier way to add mobility to the towed gun. Tow hooks from 3-ton trucks were welded to the back of tanks, turning them into Ersatz artillery tractors. Of

course, this was another interim solution, and unlike Artillery, there was nowhere for the crew to sit or ammunition. Which severely limited its mobility and the number of rounds it could carry.

Fortunately, a better solution was developed in parallel. On June 8th 1942, the Canadian Department of Munitions & Supply received a response to their inquiry on the use of the 17-pdr gun in tanks. According to this letter, a tank mount for the 17-pdr gun should be ready in two months.

On June 9th, the Canadian Chief of Staff, General Andrew McNaughton, was informed that the future Canadian Sherman tanks may be ordered with 17-pdr guns rather than the high velocity 75mm.

And soon after on July 25th, this tank would receive the name ‘M4A1 armed with 17-pdr’ and would be shortened to Buffalo II, with the M4A2 with the 17-pdr being designated as Bear II. The Buffalo II eventually evolved into the Grizzly tank, while the Bear II was cancelled completely.

The British planned to equip 30% of their tank fleet with 17-pdr guns, 60% with regular 75mm, and 10% with the 95mm howitzer for close support roles and bunker busting. There were a few candidates for compatible tanks in early 1943. The TOG II heavy tank, which ended up with an even larger 28-pdr gun and the A30 Cruiser tank, later named the Challenger.

Unfortunately, work on the TOG II stalled by this time, and it was clear a heavy and clumsy tank was completely unsuitable for the modern battlefield. The latter seemed more promising, but by the fall of 1943, it was clear that this was not a good option either.

At this point, GMC M10 tank destroyers began arriving in the UK. These were suitable for installation of the more powerful 3-inch Gun M7, and the British decided to install the QF 17-pdr instead. A very short while later, a decision was also made to do the same thing to the M4A4 tank, known in Britain as the Sherman V.

Development began in the fall of 1943, and took place around the same time work on the M10 began, which caused some confusion.

Blueprints were ready by December 3rd, 1943, except the ammunition racks, which were only completed towards the end of the month. Tanks were being tested in parallel to determine if they were also suitable candidates for the gun, however the British were afraid of overloading turrets, and so none of these were put through trials.

Two 760 kg weights were placed at the front and rear of the turret to help balance the gun, by this time, two M4A4’s were ready for trials, one with an Oilgear turret traverse, and the other with the Westinghouse.

Each tank travelled over 1,000 miles on and off-road without the use of a travel lock, the turret was also periodically rotated during movement. This strenuous trial caused both traverse mechanisms to prematurely break, but inspections showed this was not due to a design flaw.

The Oilgear traverse mechanism broke due to a manufacturing defect, while the Westinghouse broke due to being assembled incorrectly. Due to this, it was decided that both were suitable for use with the 17-pdr guns, especially since the rear of the turret gained a ton of weight. Later the final decision to use the Oilgear traverse system was selected.

A new cradle, gun shield, and mantlet were designed for the new gun. It also required a redesigned elevation mechanism due to the added weight. Two recoil brakes were necessary, and installed from the QF 6-pdr gun, however, this was still not enough to handle the sheer force from the recoil, and there wasn't enough room to install a radio behind the gun.

This led to the square box you see on the rear of the Firefly's turret, the bustle also doubled as a counterweight. However this was not the end of the changes. Three exhaust fans were added to the roof of the turret, as well as a dedicated hatch for the loader, this was because there was no way the loader could pass behind the recoil shields.

The tank carried 78 rounds of ammunition, 59 of which were stored under the turret basket, while 40 were stored to the right side of the tank, and 19 to the left. The ready rack held 5 rounds, with three under the elevation mechanism, and two in front of the loader.

Gunnery trials took place on December 30th, 1943, where the tank fired 100 shots wit the turret forward, back, and to the left and right to determine the stability of the tank. The first 96 shots were fired with no issue, the tank was stable, even with such a powerful gun mounted. The only defect observed was failure to return to battery after 42 shots in 30 minutes.

Secondary ignition of gases in the barrel was observed, but no flashback occurred. Flashback is when the secondary ignition of unburned propellant occurs within the barrel, and when ejection of the shell occurs, that pressure, and fire, comes back into the cabin, it flashes back, into the turret. This is not deadly, not in the slightest, however, say bye bye to any facial hair you have. You will become ginger.

However, everything changed when the hatches were closed for the 97th shot. Even with the engine idling at 1,500 rpm, enough fumes collected in the turret for flashback to occur. This flash was observed through an observation port cut into the turret bustle Flashback occurred on the 98th and 100th shots too. On top of this, fumes continued to burn on the floor of the turret bustle even after the flash subsided.
The flashback was not unexpected, as it has been seen before in Challenger trials, but it was still a serious drawback. Until a more permanent solution could be found, the problem could be remedied by disengaging the semi-automatic mechanism and having a strict limit on rate of fire to allow the barrel to cool. Overall, the installation of the 17-pdr was deemed a success. No deformation of components was observed, and the turret was easily traversed even by hand.

Further trials in January-February 1944 revealed more defects however. The semi-automatic mechanism had issues, closing the breech on its own after extraction. The telescopic sight was unusable in the rain, and the periscope could only be used if the commander climbed out of the turret and wiped them frequently.

The safety mechanism broke during one of the trials, locking both the electric and manual firing mechanisms, this meant that the gun was only able to be fired by striking the breech with a

mallet. All these factors limited its rate of fire greatly, with the loader only capable of 5-6 rounds per minute, with it taking 1-2 minutes to refill the ready rack from the hull.

The British had no illusions about prolonged firing from one location, as the flash from the muzzle brake would give the tanks position away. The muzzle brake was considered too heavy and made elevating the gun quite difficult. Furthermore, later trials showed that flashback was nearly nonexistent when firing HE shells.

Various solutions were attempted, such as clearing the barrel with compressed air after firing, but flashback was considered a minor problem and ignored, a screen was later installed to prevent it from distracting the commander. However, further trials continued, adding an additional extractor fan, which was found to have solved the issue.

Reliability trials were held in march, with special attention provided to the ammo racks. Testers reported issues on March 23rd, after just 941 km on road and 599 km off-road. It turned out that it was impossible to adjust the clutch and brakes as the mechanisms were blocked by the ammo racks. The racks also needed improvement, as the ammunition tended to jump around and was at risk of damage.

Final trials began in April, the tank was weighed, showing that the mass of the rearmed tank was 34.75 tons. The bogie tires, a known weakness of the M4 tanks, suffered the most, and it was decided that marching speed be reduced to 15 mph. It turned out that the turret traverse mechanism was overloaded, but an improved version was already in development.

The tank then drove for 2,761 km without the use of a travel lock to test the reliability of the turret traverse. The improved mechanism passed, and the turret was still able to be rotated at an angle of 15 degrees. Inspection showed that the turret ring was packed with dirt after driving. While this didn't affect the mechanism itself, it can promote corrosion overtime.

Army trials didn't go as well however, compared to the Sherman V, the rate of replacement of bogies was up 120%, and suspension springs by 440%. This was due to the weight showing that the suspension and final drives were working at their theoretical limits.

The tank was tested against the 7.5cm PaK 40 anti-tank gun, and it was found that the German “flashless” powder still produced a flash, but not to the degree of the 17-pdr. The 17-pdr also produced a lot of brownish-yellow smoke when firing, which is quite noticeable against the sky, but not against terrain. While the white smoke created by the PaK 40 was much more noticeable.

However, by February 1944, the stream of Sherman V tanks suitable for conversion began to dry out when production of the tank dried out in the US. While other chassis were being procured, the FVPE tested several other chassis for conversion. The Sherman I (M4) and Sherman II (M4A1) tanks were tested with ballasts. The Sherman II showed 38 defects, 11 of which were major. And further trials found that many necessary components couldn't fit the rounded hull. The British kept trying until April 14th 1944, when they stopped.

Unlike the Sherman II, the Sherman I only showed 22 defects, 5 of which were major. The welded hull was suitable for conversion, however the ammunition count was decreased to 75, with the additional limitation of the front bin not being able to contain APCBC rounds. This was because the clutch adjustment mechanism protruded through a hole in the bin and there was not enough room to fit a ballistic cap.

The cramped fighting compartment also required a spent casing bag to be emptied, otherwise it was impossible to refill the ready racks. The loader had tro throw the casings out the top hatch, however, the Americans were asked to stop welding the pistol ports in the turret shut so that spent casing could be ejected from the tank through them instead.

Unlike previous trials, the tank was tested with its engine running, it was found that after only three shots, the environment within the fighting compartment became intolerable, as there was no exhaust fan in the turret. Like on the Sherman Vc, the turret was well balanced. It took 17 seconds to traverse the turret a full 360 degrees using the electric traverse, and 1.5 minutes by hand.

Trials also took place using the M4A3 hull, however results were unimpressive. The turret was too cramped and it was hard to load the 16.8 kg rounds. The penetration was higher than that of the American 76mm guns, but it sacrificed crew comfort and was deemed not worth it. The Americans later developed their 76mm HVAP ammunition based on the British 17-pdr APDS rounds.

As powerful as the Firefly Ic was, the APCBC shells were not the main feature. The real ace up its sleeve was its previously mentioned APDS round, which had a muzzle velocity of an impressive 1,200 m/s, making it capable of penetrating up to 200mm of armour at 30 degrees. Which was more than enough to knock out even the Mighty King Tiger frontally.

Trials of this new round began in late July of 1944. With the first day being full of surprises. The gun behaved unpredictably and precision worsened after each shot fired. And due to the limited number of rounds available making investigation difficult. The cause was only discovered late August, when fragments from the Discarding Sabot clipped the muzzle brake, which resulted in damage with negatively affected accuracy. A wider muzzle brake fixed the issue, but the shells were still highly inaccurate at long distances.

Another issue caused by the increased muzzle velocity was that the tracer was impossible to see, which made fire correction incredibly difficult. The tracer was only visible at distances over 1,600 yards, which as stated before, was so inaccurate you were unable to hit a Panther sized target. The reliability of the tracers were also low, with 35 out of 48 tracers failing to ignite.

The tank left mixed impressions. While the designers were able to combine the most powerful gun with tanks the Allies had already available, the gun forced them to sacrifice a lot of what made the Sherman a good tank in the first place. Such as the reliability and crew comfort.

Nevertheless, the staff at the Lulworth proving grounds described the Sherman Ic Firefly as “one of the best we’ve tested”. However, in combat, the tank proved more than capable, the the point where the Germans were so scared of this tank, that you were so likely to be engaged if you

had one, that Firefly crews used drastic measures such as camouflaging the gun to look like a shorter 76mm, either by painting the end or by adding a false muzzle brake.

By the end of its production run, between 2,100 and 2,300 Sherman Firefly's of all variants were manufactured.

Sherman Ic Firefly (Foreground)
Sherman IIc Firefly

Grant

The Lee/Grant never achieved the fame of the Sherman, this was due purely to the role it played during the war. Born out of urgency to replace the unsuccessful M2 Medium Tank, which never left American soil.

When war broke out in Europe in 1939, the USA was far from ready for war. Its tank design was evolving through peacetime, and tactical thinking was inherited from World War I. The result of the Blitzkrieg in France came as a real surprise and immediately triggered a complete re-thinking of US tank design.

Shortly after the Battle of Britain was over, war engulfed North Africa. The British industry was not capable of delivering enough tanks to defend both its own homeland and the rest of the empire, notably crossing points like the Suez Canal. This led to a Lend-Lease act being passed on March 11, 1941, of which, the M3 Lee became its most tangible asset.

The design process of the M3 began in July 1940 as a derivative of the T5 Medium Tank. By then, the M4 Sherman, mounting a 75mm gun, was already scheduled for production, however, many features such as a fully rotatable turret design, were far from ready and the US industrial complex was not mature enough to produce the necessary numbers.

The T5E2 became the interim design and the rushed design entered production as soon as possible. This was exacerbated by the UK's demand for 3,650 medium tanks. The T5E2 was basically a scaled up M2 Medium, with better armour and a higher and wide hull designed for the mounting of an offset 75mm gun in a sponson.

The initial plans called for a fully traversable turret equipped with a single Anti-Air .30 cal machine gun, with the larger 75mm designed to engage both static targets and other tanks. However, the 37mm was still favoured in an anti-tank role, and this ended up replacing the AA gun.

An upper cupola was also initially designed with a .30 calibre machine gun, which gave the tank a cartoonish, caricatural appearance, with guns, turrets, and sponsons galore. As customary for US tanks at the time, secondary armaments consisted of between three and eight .30 calibre M1919 machine guns.

The large and roomy M3 accommodates a massive transmission unit, running through the crew compartment. It was served by a 5-speed synchromesh gearbox with differential braking to steer.

The M3 used vertical volute suspension and incorporated a self-contained return roller, which was no longer fixed to the hull. This feature was designed for ease of maintenance and repair.

The turret was geared by an electro-hydraulic system, which was powered by the main engine. This also provided pressure for the main gun's stabilizer and allowed the turret to traverse a full rotation in less than 15 seconds.

The powerplant was an aircraft-based Wright Continental engine which was air-cooled and was the perfect choice for speedy production as there was no other dedicated engine powerful enough at the time. The upwards position of the transmission, and tall engine, forced the entire casemate to be raised, this led the overall height of the M3 to become 3m. This became a large drawback in combat, with the Germans nicknaming it a "splendid target".

The M3 however, was not the initial choice of the BRitish commission. The wooden mock-up was built when the first plans were ready and presented in 1940. Several flaws appeared immediately, among them, a high profile, a sponson, a riveted hull, and insufficient armour.

But as production was scheduled to start quickly, and hoping for improvements in later versions, an initial order for 1,250 M3's were placed and was given to three American Companies, the Pressed Steel Car company, Pullman, and Baldwin. These British models were designated as the M3 Grant.

The turrets were cast by Union, General Steel Casting, ASF and Continental, which explains the vast differences between the M3 and M3A1, and between the British and American models. The British prototype was ready in March 1941, which included a distinctive turret back bustle to accommodate the Wireless Set No. 19 radio, stronger armour, and no machine-gun cupola which was replaced by a hatch. The armour increase was not originally planned but was introduced as soon as new reports of german anti-tank capabilities were available.

Initial crew members included a driver, commander, gunner, loader, upper gunner, and a machine-gun servant, with the British model's radio being operated by the commander.

Ready for mass production, 4,724 M3's were built in the first batch, which started in mid-1941, with the second batch of around 1,334 units built until December 1942, encompassing the M3A1 to the M3A5 versions. The M3A1 or M3 Lee II featured a cast rounded hull, with a low profile turret and slightly thicker armour, with only 300 of these being built.

These were followed by the M3A2 or M3 Lee III, which had a welded sharper hull, had the same low profile turret and slightly thicker armour. Only 12 of these were built before a more improved M3A3 was developed, also called the M3 Lee IV and V, featured a welded hull, and a pair of improved GM 6-71 diesel engines. 322 units of these were built.

The M3A4 followed suite, which had a stretched welded hull, and a new Chrysler A57 multibank engine, which was a strange assembly of five 6-cylinder L-head car engines mated to a common crankshaft, this monstrous engine boasted a 21 litre capacity and 470 bph. This was well received, as the initial model was known to be underpowered. However, only 109 of these

would be built before the last production variant was released.

The M3A5, which was the tank mostly fielded by the British as the “Grant II” was equipped with the previous twin GM 6-71 diesel engines, but had a riveted hull and a Lee turret. This variant specifically, showed a variety of shapes for the hull, turret, and other details, mostly due to different casting procedures by multiple contractors. In total, 591 of these would be produced.

The First engagements came with the disastrous battle of Gazala, where the Crusader, armed with only a 2-pdr gun and minimal armour, was the main British design. The Grant’s went on the be used in each of the major engagements of the African campaign, from El Alamein to the end of the Tunisian campaign in mid-1943. By then, up-gunned Pz. III and IV’s proved deadly to the M3 and was soon replaced by Shermans and British designs mounting the more powerful 6-pdr such as the Cromwell.

M3A5 Grant II (Grant next to the M3 Lee)

Lloyd GC

Carriers were a series of utility vehicles produced during the Second World War to fulfill a number of roles including troop transport, reconnaissance, and towing guns. Though mundane compared to roles of other armoured vehicles, they were the backbone of the British Army during the war. They found use throughout the forces of the Commonwealth and American Military and were even used by the Germans when captured.

The Loyd Carrier, officially designated as ‘Carrier, Tracked, Personnel Carrying’ was designed by Captain Vivian G. Loyd in the late 1930s. However this was not his first design. He previously worked with Sir John Carden on the famous Carden-Loyd series of Tankettes.

The Loyd Carrier was part of a rapid-development program, so many of the carrier's components were borrowed from other vehicles. The vehicle was specifically designed around the drive system of the 15cwt 4x2 Fordson 7V truck. This included its engine, gearbox, transmission, and final drive. The Track, drive sprockets, and suspension units were all taken from the Bren Universal Carrier.
The chassis was also borrowed from the Fordson truck, and mild steel bodywork was added. A large, sloped, 7mm thick armoured plate known as a ’BP Plate’ was placed at the front of the vehicle with bolts. This was enough to deflect small arms fire, and due to the sloping, was a little more effective than the Universal Carrier.

The upper hull was enclosed at the sides, and front but open at the rear with no roof. This was not seen as an issue due to the roles undertaken by such a vehicle. It did not need an expensive armament, and a Single Bren LMG was sometimes carried for defensive purposes.

The power plant used was, as mentioned, the same as the truck, using the 85 hp Ford V8 Side-Valve engine which was located at the rear of the carrier, with a radiator behind it. A driveshaft carried the power through to the front of the carrier into the exposed axle, which then was transferred into sprocket wheels that drove the tracks.

Steering was nowhere near as complicated as the track bending methods of the Universal Carrier. Both drive wheels were fitted with brakes for steering and were actuated by steering tillers in the drivers position. Braking the left track would turn the Carrier left, and so on.

The suspension was of the Horstmann type, consisting of two double bogies mounted at the centre of the vehicle. Single rollers were mounted atop the bogies as return rollers.

The prototype was tested by the Army in late 1939, with an initial order of 200 vehicles following soon after. Production then commenced at Loyd's own company, however it moved to larger firms later in the war.

The specific tank we are talking about here, there isn't much known about. However, we do know that it was a slightly more elaborate conversion attempt to place a 28-pdr field gun to the chassis. The crew compartment was completely removed and the gun was introduced directly onto a bare chassis. A second vehicle would have been needed to carry the ammunition with it.

The recoil of such a powerful gun on such a light chassis would no doubt have caused the vehicle to react quite violently. This is likely the main reason for it not going anywhere.

The Loyd Gun Carriage in game has a 17-pdr mounted, which is incorrect, there are no known prototypes mounting a 17-pdr to the tank, only the 28-pdr prototype. Interestingly, the 17-pdr modelled in game as a field gun, is actually an anti-aircraft gun.

Loyd Gun Carriage Prototype
QF 17-pdr Mk. III (gun mounted in game)

M2

Before the M1 Combat Car and M2 Light tank models were approved for production, attempts to effectively mechanise the armed forces of the US had been a struggle. Funding was relatively scarce, as the US was in the midst of the Great Depression. This also coincided with past debates within the Army on how truly effective armour will be in future battlefields. The National Defense Act of 1920 had restructured, regulated, and disseminated the military, as well as its ability to procure new weapons systems.

Many previous designs had been largely prototypes, or had an extremely limited production run and by the 1930's, tank reserves within the US Army mainly consisted of outdated models or overly ambitious dead-end projects.

In spring of 1933, George Dern, the Secretary of War, decreed that development of new light tanks and combat cars should commence, importance was placed on the maximum weight of roughly 6.8 metric tonnes. Previous designs such as the T4E1 Combat Car had proven to be mobile, using Christie-type suspension and a controlled differential, but were too heavy and too expensive.

A year later on April 23rd 1934, the Combat Car T5 and Light Tank T2 were demonstrated at Aberdeen Proving Ground. Both vehicles had been designed and built by Rock Island Arsenal, and as such, were similar in many aspects of their design.

The Combat Car T5 featured VVSS bogies, and oddly enough, initially had two open-top turrets, which would later be replaced by a single closed-top design, and was eventually accepted into service as the Combat Car M1. On the other hand, the Light Tank T2 utilised semi-elliptical leaf spring bogies, reminiscent of those found on the Vickers 6-ton.

Following trials, it was found that the dated leaf spring suspension was less robust, less flexible, and provided a worse ride compared to that of the VVSS. The T2 Pilot was modified to accept new tracks and running gear, and at some point, was given the Hispano-Suiza 20mm autocannon and a cupola. However, neither armament nor the turret would appear on the future tanks. Following these modifications, the T2 was redesignated as the T2E1 and accepted for service as the Light Tank M2A1 in 1935.

Excluding the T2E1 prototype, only 9 additional M2A1 tanks were produced before production shifted to the revised model, designated M2A2. The most obvious change between the M2A1 and M2A2 was the layout of its armaments.

The M2A2 sported two turrets. The twin-turret layout was put on trial with an experimental designation of Light Tank T2E2, and much like the Light Tank T2, it had adopted VVSS from the Combat Car T5.

The tank was soon accepted for service not long after the M2A1 and as the two variants were compared throughout its trials, the twin-turret M2A2 was preferred and was slated for mass production in 1936.

The hull of the M2A2 was rather boxy, with only a few sloped angles. The upper, middle, and lower frontal glacis plates were sloped at 17, 69, and 21 degrees respectively, with all pieces being 16mm thick.

The entire upper frontal armour could be opened, through a variety of hinged plates, allowing easy egress and access to the vehicle.

The side armour of the M2A2 was completely vertical and 13mm thick with the roof and floor being 6.4mm thick. As with the turrets, the armour was only designed to be sufficient to protect the crew from small arms and rifle calibre fire.

The tall radial engine had a vented shroud with semi-circular armour that conformed to the shape of said engine. However, this was later changed to an angled engine shroud for ease of manufacturing.

The M2A4 would become the final iteration of the M2 chassis, featuring a single, two man turret that mounted a dedicated 37mm Gun M5 with a coaxial .30 Calibre machine gun. Two more machine guns were fixed to either side of the hull facing forwards.

The M2A4 would mostly see combat in the Pacific, notably in Guadalcanal with the marines, while the previous M2 iterations would be relegated to training use only, before being replaced by the M3 Light Tank.

The M2A2 and A3, while seemingly being outdated with their twin turret layouts and armament of only machine guns, were a product of continuous effort to modernise the armoured forces of the US Army. With the M2A2 being approved for mass production, the Army could observe and address problems with their designs, and streamline the process.

With the realisation that a .50 calibre M2 machine gun was not adequate for anti-tank use, the M2A4 would return to a single turret and mount a dedicated tank gun. The components tested on the M2 series chassis would lend a great deal of their design to the following M3 and M5 series of light tanks, which would serve for the remainder of the war.

Towards the end of 1941, with the Lend-Lease program, the British Army received a total of 4 M2A4 tanks for use within their armed forces. These would be designated as simply M2.

A picture of the tank

Medium I

The early 1920's were a difficult time for the British Royal Armoured Corps (RAC), with their First World War tanks becoming worn down and obsolete, and many in-house designs such as the Medium D and C failed. This was a major issue for the RAC as the Treasury had provided a sum of £220,000 for purchase of new tanks to completely reequip the RAC.

If however, a new tank could not be found then this money would be reclaimed by the Treasury. This would push acquisition of new equipment back by years and leave the RAC with old First World War tanks such as the Mk. V and Mk. A Whippet tanks well into the late 1920's.

Then, in 1923, the army received two new tanks. Although completely unarmoured, these tanks would be the forerunners of a design that would see service until 1941. These two tanks were the Vickers Medium Mk. I and Vickers Medium Mk. II.

Almost no clue can be found to their origin however, with the only clue coming from a copy of The Commercial Motor Magazine of October 1933, in an article talking about a tractor, the designer being introduced as Mr. C. S. Vincent-Smith, whom it is claimed to have designed tanks for the Army. This is the only tenuous link to the creation of the Medium tanks.

The First two tanks (one with the registration T15), were designated A2E1, Tanks, Light, Mk.I, and with improvements to the design, it was later redesignated as Tanks, Medium, Mk.I, being shortened to Vickers Medium Mk. I today.

A short timer later, in 1923, a single A2E2 arrived, being called 'David' and had the registration T18 and was the only Close Support (CS) Mk. I variant ever built, which mounted a 15-pdr tank mortar.

The Vickers Medium Mk. I featured a circular turret which mounted a QF 3-pdr Mk.I L/32 gun, with a Hotchkiss machine-gun in a coaxial position. The turret had another two Hotchkiss machine guns placed 180 degrees apart in ball mounts which served little purpose.

The Mk.I was powered by an Armstrong Siddeley V8 engine mounted in a compartment separated by a firewall from the Fighting compartment and the drivers compartment to the right of it.

The Medium went through several iterations and two marks during its life. The first of which was the basic Mk. I design. Following further modifications, the tank was redesignated as the Mk.IA, which had 8mm add-on armour plates, and a bevel added to the rear of the turret to mount an AA gun.

Later in the Mk.IA production run, some modifications were made including the removal of the Hotchkiss machine gun, replacing it with a Vickers machine gun, likely for ease of maintenance and part sourcing. And a lead counter balance was added to the rear of the turret. These changes redesignated the tank as the Mk.IA*.

In total between the Vickers Mk. I's two production runs, 80 vehicles were produced where they remained in service until 1938 alongside the Vickers Medium Mk. II until they were replaced with more advanced vehicles such as the Matilda and Cruiser tanks.

In terms of the game, the Vickers Medium only ever used a 3-pdr gun (other than the CS ofc), and never mounted, or was intended to mount, the 6-pdr gun.

Vickers Medium Mk. I

Vickers Medium Mk. IA

Vickers Medium Mk. I CS

Vickers Medium Mk. IA*

Medium II

For most of the information, see the Medium Mk. I above.

The Vickers Medium Mk. II was delivered soon after with the Medium Mk. I, and was intended as the continuation of the design with many notable changes.

What didn't change was the engine, being the same Armstrong-Siddley V8, the armour, being between 4 and 6mm, and the general layout, having the engine next to the driver, and three separate compartments being the engine compartment, fighting compartment, and drivers compartment.

The first production variant was of course, designated as the Vickers Medium Mk. II, which was produced between 1924 and 1927 with around 100 built. The notable differences from the Medium Mk. I was the upgraded armament, with the Medium Mk. II packing the new QF 3-pdr Mk. II L/40, which had a bit more punch than the shorter 3-pdr Mk. I. The steering clutches were replaced with Rackham clutches and the driver's position was raised.

Later in 1930, a number of modifications were undertaken on 56 Mk. II's to improve their effectiveness, this included the removal of the older and foreign Hotchkiss machine gun, and replacing it with a Vickers, the same as the Mk. IA*, and a lead counter balance added to the rear of the turret. And to improve vision for the commander, a 'Bishop Mitre' cupola was added. This was then redesignated as the Vickers Medium Mk. II*.

More modifications were then undertaken in 1931, with a further 50 Medium Mk. II's modified with a box at the rear of the turret to house two MB radios, and a smoothed turret roof. Radios were the beginning of a massive modernisation of battlefield tactics compared to the flag or similar systems used to previously communicate between tanks.

Then came the Mk. IIA, which was specifically designed for deployment in Egypt, and to do so, was modified to suit. Firstly, they removed the Bishop Mitre cupola, likely to lower the silhouette height, and many were fitted with asbestos panels to improve thermal insulation to help keep out the heat.

And Finally, the Mk. IIA*, which was identical to the Mk. IIA, however it had the Bishop Mitre cupola and a radio box from the Mk. II**. There were said to be 10 modified to deploy in Egypt, however we are unsure how many of each mark were modified.

The Vickers Medium Mk. II came to the same fate as the Mk. I, being retired from service by 1940 when more advanced, faster, better armed and armoured Cruiser and Infantry tanks started being mass produced. In total, upwards of 100 were manufactured between 1925 and 1934.

Vickers Medium Mk. II
Vickers Medium Mk. II*
Vickers Medium Mk.II**
Vickers Medium Mk. IIA
Vickers Medium Mk. IIA*

Medium III

By the early 1920's, the British Government's enthusiasm for a state tank program had completely collapsed following the unsuccessful Medium Mk. D had eaten up the majority of the Government Tank Design Bureau's budget and was terribly unreliable.

Fortunately, the Vickers Company had begun competing with the Government over a contract for a replacement tank for the infantry in 1920. By 1923, when the Mk. D fell through several prototypes of what would become the Vickers Medium Mk. I were produced.

The Vickers Mk. I and Mk. II Medium tanks were definitely a substantial improvement over the World War I era vehicles still in service such as the Mk. V Heavy tank and Whippet Mk. A's. These tanks incorporated a rotating turret and were more mobile than the tanks it replaced.

White it may seem trivial, this three-man turret design was a revolutionary leap in design, with the design taking the workload off the commander and main gunner, which was generally the same person in interwar designs.

Despite these innovations, the vehicles had serious flaws. Some were quickly recognised, others not so quickly. Even back in 1926, there were requests for an improved vehicle to be developed.

The Mk. I and II's proved difficult to drive, and their top speed of only 15 mph, while meeting the requirements, left much to be desired.

While they weren't as gremlin-ridden as the World War I tanks, many improvements were suggested to make a more reliable vehicle. Among these, was the request for 6mm of added armour to improve the protection of the vehicles, which was currently worse than that of the 1916 Mk. I heavies.

By September 1926, Vickers accepted the task and with requirements in hand, they set off to work. The weight limit was set to 15.5 tons, this was so they could be supported by standard British Army pontoon bridges of the day. The tank was also required to be easily transported via rail, it needed space for a wireless radio set, and for it to run quietly, relative to it being a tank. Later, simpler and easier steering and even more armour protection was requested.

The initial design submitted by Vickers-Armstrong was named the A6, and was loosely based on the A1E1 Independent, which was still in testing at the time.

The A6 design featured the same QF 3-pdr gun as used on the Medium Mk. I and II, but it was housed in a two-man turret, accompanied by three secondary machine-gun turrets. One was at the rear with an anti-aircraft machine gun mount and two at the front of the vehicle with two machine guns in each, although later it was reduced to one.

The A6 featured frontal armour values of 13mm and 7mm on the sides and rear, this kept the weight down to around 14 tons, while having more than enough protection to block most small projectiles without much trouble. And with the tanks 180 hp Armstrong engine, the A6 would reach a top speed of 20 mph on road.

In 1927, after the wooden mock-up was approved, the prototypes were ordered and fitted with a new hydraulic Wilson Epicyclic steering gearbox. The three prototypes that were produced with the Armstrong V8 exceeded expectations, managing a top speed of 26 mph, which was quite rapid for the interwar period. However, the machine gun arrangement was not well received during trials in 1928, and the vehicle was not judged as superior to the Mark II to warrant production.

Determined to salvage the project, Vickers-Armstrong ordered an improved vehicle in 1928, with two being built at the Woolwich Royal Ordnance Factory and another at Vickers. These featured slightly improved armour, with 14mm on the front, and 9mm on the sides, a slight improvement over the previous design. The new turret was also capable of housing a wireless radio set. The rear machinegun turret was completely abandoned, while the other two were shifted forward to improve weight distribution.

From 1930 to 1933, further trials were far more positive. The vehicle was deemed reliable, offered greater crew comfort and provided a more stable platform for the 3-pdr gun than that of the Mk. I and II. Additionally, the top speed had further improved to a highly respectable speed of 30 mph.

For all that work, the suspension proved quite overloaded and the track components were wearing quickly when used off road. However, the high cost of the eight year project more than outweighed the technical improvements, and no further orders were made.

By the mid-1930's, British tank doctrine was moving on, and the Medium Tank had no place in it. However, when the Soviets came to look at some British vehicles, they somehow managed to get a lot of information on the A1E1 Independent prototype and the Vickers Mk. III. After investigation a British Officer was court marshalled however these plans are said to have provided some inspiration for the Soviet T-28 Medium Tank.

The last batch of these Medium III tanks were used as command vehicles for the largest combined arms training exercise of the era, notably the one in 1934 at Salisbury Plain. Unfortunately, shortly after these operations, one vehicle was written off, the other was destroyed in a fire, and the last remained on the training ground until 1938, where it was scrapped. No vehicles have survived to this day.

A picture of the tank

Sexton II

Developed as a modification of the Sexton I, the Sexton II was built on the basis of the Grizzly (a Canadian production lease M4) instead of the Ram. The vehicle used the same gun as its predecessor but featured modifications to the driveline, bogies, storage and fighting compartment.

The Sexton I would only be used by the Canadian army, whereas the Sexton Mk II's would be used by the British. In total 2026 vehicles were ordered and produced between early 1944 and early 1945.

A total of 2150 vehicles would be built, with the first 120 or so being the Sexton I.

For more info read about Sexton I

A picture of the tank

Sherman III

With the Lend-Lease program between the British and Americans, the British took the Lee and Sherman into combat for the first time, and offered a lot of input into both designs. They even had a specific variant of the M3 Lee which was never used by the Americans, being the M3A5 Grant.

The Sherman and Lee tanks were the decisive factor in the battles at El Alamein, and with the British alone receiving almost 17,000 Shermans of various models, there is no doubt that the tank became the backbone of their entire tank force during World War II.

The British had a very unique way of using tanks, preferring to send them into battle without direct infantry support. This, coupled with their tendency to stuff every nook and cranny with ammo, resulted in much higher ratios of losses compared to their US counterparts.

The Sherman III was redesignated from the American designation of M4A2, which was the second most common variant of Sherman tank. They received, through the Lend-Lease program, 5,041 M4A2 75mm Sherman III's from the Americans. Along with those, they also received 5 M4A2 76(W) or Sherman IIIa tanks.

The British also enjoyed modifying these tanks in their own manor, with side skirts being added, racks for jerry cans, and armoured boxes in some cases being added to the back of the turrets for radios. Speaking of, they usually pulled the American radios out and installed their own Wireless Set No. 19 radios, mainly for the Firefly tanks.

As the war progressed, the US Army put a priority on the M4 and M4A1 variants, this meant the British had to settle for the M4A2 and M4A4 or Sherman III and Sherman V tanks. And then, the Russians refused to take any Shermans but the M4A2's, which narrowed the Brit's options to purely the M4A4.

A picture of the tank

Stuart I-IV

The M3 Light was built under the light of recent events in France. The quick fall of France, mostly due to inadequate tactics, quickly led the US Army Corps to rethink its doctrine, which led to an independent US armoured force. From the material point of view, the latest M2A4 and the M3 were both designed to be more effective than only infantry support units.

Officially, the cavalry corps was integrated in this new armoured force and the official "cavalry tank" designation was replaced by "light tank", with the main duties of the new tank type being reconnaissance and screening enemy positions or fortifications.

The M3 was, at first, a simple upgrade to the M2, with a more powerful Continental engine, a new Vertical Volute Spring Suspension system and upwards of four machine guns in addition to its 37mm Gun M5 which featured a new recoil system.

For scouting, the 37mm Gun M5 was a good asset, it could punch through any lightly armoured German tanks pretty easily, a perfect fit for a light tank. Although compared to its German counterparts, the M3 was much larger and more heavily armoured.

The M3 was the first production model, with most being provided to the British through the Lend-Lease program as the Stuart Mk. I and Mk. II. Some of which were immediately thrown into action in Northern Africa, where they immediately became popular for their speed, sturdiness, and reliability.

Although the British officially designated them as the "Stuart" which was a homage to the Civil War Confederate General J.E.B. Stuart, the crews generally used the nickname "Honey", due to its smooth ride from the VVSS.

After many trials, the first production M3 was delivered in March 1941, with tanks being produced until October 1943, when they replaced all their M3's with M5 Stuarts and M24 Chaffees.

In total, 5,811 M3 Stuart Mk. I's were produced, including 1,285 equipped with the Guiberson diesel engine, which was more efficient in the long run for desert operations, which was designated as the M3 Staurt Mk. II, and was only used by the British. The turret basket was introduced on some late "Stuart Hybrid" models as well, which protected the commander but raised the silhouette. This later became the main visual characteristic of the M3A1's.
The M3A1 was introduced in May 1942, and had an improved turret design, including the turret basket we mentioned previously, and a higher M20 M1919 AA mount. The sponson guns were also officially removed, as they had been unofficially on the previous models.

In total, 4,621 M3A1 tanks were produced until the last were delivered in February 1943. These M3A1's were largely distributed to the British under the designation of Stuart Mk. III, and the diesel variant, Stuart Mk. IV. They also were given an improved gun vertical stabiliser.

US Forces used many of them in their first major operation in North Africa in November 1942, where they had varied success against Italian tanks, but were butchered by the German 8.8cm artillery guns and the up-gunned Pz. III and Pz. IV tanks. It became clear that the high profile, mixed with the flat squared hull was too vulnerable and easy to hit. As a temporary measure, before replacement by a newer model, the M5 Light tank.

A total of 6,889 Stuart I-IV tanks were supplied to the British throughout the War using the Lend-Lease Program, with the vast majority of them seeing combat in North Africa.

M3 Stuart Mk. I-II
M3 Stuart Mk. III-IV

UC 2 Pdr

The early Carden-Loyd tankettes from 1933 were the very basis for the Universal Carrier. Originally, these machines were invented by Major Giffard LeQuesne Martel, who developed a prototype privately for potential requests of the Royal Army Corp. He was a military engineer and a daring tank strategist.

After his demonstration to the War Office, the Carden-Loyd Tractors Ltd. company was requested to study practical production. This vehicle was slightly larger, capable of seating two men comfortably. This prototype successfully passed trials and with that, a guaranteed first order, and with the Vickers-Armstrong business network as backup for exports.

The Universal Carrier in service with the British were used as Scouts, transports, machine-gun carriers, artillery carriers, mortar carriers, and smoke carriers among other things. And later on, experience showed that a single model was preferable to six or more, and a larger Universal Carrier was conceived by Vickers and approved for mass production as the "Medium Machine-Gun Carrier". The suspension was a mix of the standard Vickers type and Horstmann springs

The Mk. II tankettes were the production version of the many "Carriers" which were built between 1935 and 1940. This standard version had a square gallery and was versatile enough

to accommodate all kinds of payloads with ease. The Mk. II was the most heavily produced variant in Great Britain, The Commonwealth and Canada under various licences.

Their speed and agility became legendary despite their lack of armour and weaponry. Generally, infantry battalions were given between 10 and 33 Universal Carriers from 1940 to 1943 and motorised artillery battalions heavily relied on them as well, each carrying an ordnance QF 6-pdr anti tank gun.

The Main variant we have in-game was called the Carrier, Anti-tank, 2-pdr, and was a Universal Carrier Mk. II with an Ordnance QF 2-pdr gun bolted to its chassis with a gun shield added to protect the crew from small arms fire. Around 200 of these are said to have been built but information is scarce at best.

In total, around 81,700 Universal Carriers were built during the war, and a further 31,300 after the armistice. The concept was highly successful, not just in Britain, but in many other countries as well.

Pictures of the UC 2-pdr (1, 2)

Other

Centurion Mk. IA

This in game represents a stock Centurion, however the designation IS real, and was effectively the Centurion Mk II, before it was called the Centurion Mk II existed. It is worth noting that this only was referred to as A.41A as opposed to Centurion Mk 1A.

In text reference to A.41A

Chieftain Mk 6

A Chieftain Mk 2 that also featured modifications of the Chieftain Mk 5. This happened in 1975. It's best to try and look for a picture of a Mk 2 chassis that looks like a Mk 5 around the year 1975 onwards.

A picture of the tank

Churchill VI

The Churchill Mk. VI was the designation given to Churchill's that were armed with the British 75mm tank gun in the same turret as on the Churchill Mk. IV, or the cast turret.

Interestingly, the first Churchill tanks to carry a 75mm gun was the Churchill Mk. IV NA75, which was basically a 75mm gun salvaged from wrecked or damaged Sherman tanks and retrofitted to the Mk. IV Churchill, this was because the Mk. IV Churchill was only armed with a 6-pdr gun, which was plenty powerful for the early war, but once German Pz IV's and up-armoured Pz. III's started arriving in North Africa, the gun wasn't enough. The tank also performed well in Italy, which further cemented the need for a dedicated 75mm design.

This led to the British re-boring their Ordnance QF 6-pdr gun to take American 75mm ammunition. It wasn't ready until winter of 1943-1944, and at that point, it was installed in two variants of the Churchill. The most important was the Churchill Mk. VII, a major redesign with a new cast and welded turret, thicker armour, and added integral armour plates.

The Churchill Mk. VI was a much less dramatic upgrade, being effectively un up-gunned Churchill Mk. IV. It kept the cast turret from the Churchill Mk. IV, but added a cupola and vane sights. The Churchill Mk. VI also had a composite hull, with armour plates being installed on top of its basic superstructure.

The Churchill Mk. VI began to appear on the battlefield in November 1943, however, it was short lived with only 200 being built before it was replaced by the Churchill Mk. VII.

During 1944, the Churchill Mk. VI was upgraded with the installation of appliqué armour. Two designations were allocated to the vehicle. The Churchill Mk. X was a Churchill Mk. VI which had the new cast and welded turret introduced on the Churchill Mk. VII, while the Churchill Mk.

X LT kept the Churchill Mk. IV turret with the 75mm gun, but added the appliqué armour. And with a shortage of turrets, the Churchill Mk. X LT became the only version produced.
Churchill Mk. VI Churchill Mk. IV NA75
Churchill Mk. X LT

Churchill VIII

The Churchill Mk. VIII, or A22F, was a version of the Churchill Mk. VII that carried a 95mm howitzer in place of its 75mm gun.

In May 1943, a decision was made to order 1,000 Churchill's for production, and to continue their production into 1944. The 1944 production run would be of a new 'Heavy Churchill', being the A22F (called A42 from 1945 onwards).

This featured much heavier armour, which was upwards of 152mm on the front glacis plates, a new turret with cast sides and a welded roof, new doors with rounded corners and a slightly conical shape, a new and improved gearbox, and heavier suspension.

The Churchill Mk. VIII was produced in two variants. The first was the Churchill Mk. VII mounting the British 75mm gun, and the second was the Churchill Mk. VIII, mounting a 95mm howitzer, which was a close support weapon capable of firing a much more powerful high explosive shell than the 75mm, but at the cost of velocity.

No more than 10% of the Churchill's production in 1943 and 1944 went towards the Churchill Mk. VIII, so basically there were nine Churchill Mk. VII's for every Churchill Mk. VIII. Unfortunately, the exact number of Churchill Mk. VIIIs that were built is unknown, but some sources suggest 200, but the final figure could be slightly lower.

Churchill Mk. VIII

COMRES 75

The examination of concepts for a Main Battle Tank to replace the Chieftain had been on going since the issue of the GSOR 1008 project in January 1961. And whilst these vehicles were being studied, the design of future components was actively being pursued under the Comres 75 authority. RARDE had been studying weapons and FVRDE had been studying new forms of armour as well as automotive and fighting equipment.

With this, in December 1966, an innovative project was initiated to explore the feasibility of an external gun system for armoured vehicles. This project aimed to address the challenges of crew protection and vehicle design by experimenting with unconventional configurations.

Over the next few years, a research vehicle was constructed to validate these concepts, and was unfortunately cancelled with the invention of Chobham Armour, and scrapped in 1971.

This research vehicle, which was completed in 1968, was an unarmoured experimental platform which weighed approximately 30 tons. Its dimensions were comparable to those of the British

Comet tank, though its height remains unknown. The Comres 75 was designed to be operated by a three man team, and its main armament consisted of a 105mm gun.

The hull was a Comet hull with no modifications, this means the Comres 75 used the same engine, transmission, steering, suspension, and hull materials that the Comet used. This was mainly done to expedite development.

The focus of the project was its external gun system. Early prototypes included a steel/alloy mock-up of the weapon, which allowed for initial evaluations of power-assisted gun laying mechanisms. Automotive trials were undertaken at Kirkcudbright to assess the vehicles configuration and mobility, demonstrating its practicality in operation.

One of the potential advantages of this system noted in the trials, was the enhanced crew protection, having the gun externally placed, with an autoloading system, the crew could be safe inside the hull while only exposing the gun to fire. This placement also allowed for an incredibly small silhouette. This in-turn, greatly improved the overall survivability of the vehicle.

However, the concept also faced substantial issues. The main issue being the complete lack of protection for the main armament, which left the only means of defence highly vulnerable to enemy fire, if it were to be impacted by a round.

The need for an advanced autoloading system, which had yet to be designed, was also a heavy detractor from the project, introducing complexities in weapon operation and maintenance. Additionally, the external placement hindered crew visibility, raising concerns about situational awareness.

And the final nail in the coffin, touched on earlier, was the advent of Chobham armour, a revolutionary composite armour system, which used different materials such as ceramic, rubber, glass, and plastic to improve armour effectiveness, rendered this sort of platform less relevant in the evolving context of modern armoured warfare.

Pictures of the Comres 75 (1, 2)

Picture of the blueprints

FV205b Alligator

This is a fictional tank, with a fictional designation.

FV301

The FV301 has its roots in the A46 Light Tank project, developed in 1943. Development was briefly halted after the end of World War II, but it was revived as the FV300 series in 1946.

At the time, the development of three new tanks were planned, including the FV200 series, the FV300 series and the FV100 series, which was cancelled quickly due to the existence of the

Centurion Project, or FV4000 series. While the FV200 series eventually became the and ended with the Conqueror.

The FV301 light tank was the first model in the FV300 series, which began full-scale development in 1947. The tank used a Rolls-Royce Meteor V12, which produced 500hp, coupled to the TN10 transmission. The tank would also run on torsion bars for improved stability.

The turret was manufactured by welding pieces of cast steel onto the front, and RHS on the sides and rear, and was manufactured with crew space in mind.

The armour thickness was 2 inches at the front, and weighed 21 tons in total.

The tank mounted the 77mm HV gun from the Comet's, with the addition of a coaxial machine gun. However, it was equipped with a new recoil system to ensure improved accuracy. Up to 80 shells could be stored in the tank.

However, the battlefields of 1950's Europe were likely going to require a different war to what this series of tanks would accomplish, and thus, the FV300 series was cancelled in 1953. However, this project would eventually evolve into the FV101 Scorpion and CVR(T) series which continued the FV301's lineage.

Picture of the Tank

Valentine IX

See This for more information on the Valentine.

With the obsolescence of the 2-pdr gun becoming very apparent with the first clashes between heavier German tanks in North Africa in the Spring and Summer of 1941, work began to improve the weapons of mass produced British vehicles.

The Ordnance QF 6-pdr, which work had begun on in 1938, claimed the role of this main armament. The first versions of the gun was shorter than the original design, however the L/43 gun was very successful, even the up-armoured Pz IV tanks struggled against the 6-pdr.

While the mounting of this 6-pdr gun on the Churchill tanks, in the Churchill Mk. VII, the Crusader and Valentine variants were less successful. In both cases, the turret had to be completely redesigned.

The Crusader Mk. III saw battle first, and the new gun was clearly an improvement, however it was still less powerful than the American Sherman II and III tanks. This caused the obsolescence of the Crusader in Spring 1943.

The Valentine had to undergo serious turret modifications to receive the new gun. Using the Valentine III's turret, the Vickers designers managed to free up space by reducing the crew to two. The gun did fit into the turret, however at the cost of a coaxial machine gun.

The tank was supposed to be accepted into service as the Valentine VIII, but the order for this variant was cancelled. The fact that by this time, the British decided to finally switch to the GM 6004 Diesel engine, meant a redesignation to Valentine Mk. IX.

We don't know specifically how many Valentine Mk. IX tanks were built specifically, however we do know there were at least 300 built.

Valentine Mk. IX

Valentine Mk. IX Blueprints

Vickers CR

The Vickers Medium Cruiser Mk. I, was a private project by Vickers to produce a simplified version of the FV301 light tank for the export market. Therefore, it was not as refined, nor modern as other vehicles of its day, but was intended for customers who did not want a full-blooded MBT and its associated costs.

The story of this tank technically dates back to the 1940s, when the British laid out a number of fighting vehicle series to cover the military's requirements. These include the FV200 series, which produced the Conqueror, and the FV4000 series, which produced the Centurion.

However, the lesser known FV300 series, which was intended to result in a wide range of vehicles that covered multiple roles, such as armoured personnel carriers, self-propelled guns, and ARV's.

Particularly important to the Cruiser Mk. I, was the FV301, a light tank from the FV300 series developed by Vickers. With their experience from that project, they began work on an export tank of similar specifications in 1954. The tank was aimed at the French, indicated by its associated documentation.

Visually, the tank was similar to the FV301, but it was marginally heavier and slightly longer. The new tank did have a pretty dated design, especially compared to the more recent vehicles such as the US M48 Patton and British Centurion tanks. However, it was never intended to be a contemporary of these vehicles, it was aimed towards nations with more constrained budgets that did not require cutting edge equipment.

The Medium Cruiser Mk. I had a crew of four in a conventional layout, with the driver in the front right of the hull, and the rest in the turret. The driver did have access to the fighting compartment through a bulkhead behind him.

The tank was not very heavily armoured, having only 44mm of frontal armour, which was angled at 36 degrees, however this only made a minute difference. The hull sides and rear were both 19mm thick and were mounted vertically. This may seem thin, however it was comparable to that of the AMX-13.

Mounted in the centre of the hull, was a six sided turret, which was similar to the FV301, but more simplified. The front was a large piece of cast armour 50mm thick at a slight angle, with

the rest of the turret being a welded design. It sat on a caged ball race over a 64-inch diameter turret ring. The Commander's cupola did feature a 360 degree vision cone, however it lacked the Reflector-Cum-Periscope that the FV300 series had, which was still under development.

The main armament was the High pressure 77mm gun, the same used on the Comet and FV301, however, unlike the FV301, it did not feature an experimental automatic loading system developed by Elswick, and instead, had a semi-automatic breech.

The traverse system was electric, and also had a manual secondary traverse system, and could be used for fine tuning. The gun fired APCBC rounds at 820 m/s shell velocity and could penetrate upwards of 120mm of steel at 900 metres. The tank also had a coaxial BESA machine gun.

Power was provided by a 530 hp Rolls Royce Meteorite Mk. II engine, which was a cutdown version of the V12 Meteor, which itself was a derivative of the famous Merlin engine. It was coupled to a V52 gearbox that drove the rear sprockets. This gearbox would later be used by the FV4202 test bed.

Exactly who ordered the Vickers Medium Cruiser Mk. I is unknown, documentation and excerpts, of which are written in French, indicate it was for France, or at the least, a French speaking nation.

Other small details such as an Arabic plaque, may point towards a Middle-Eastern customer, but unfortunately the truth is unknown at best, with the most likely cause for cancellation being that the customer simply didn't need the tank anymore.

In terms of WoT Blitz, the turret is obviously fabricated, with what looks to be a British Centurion Mk. I turret, with the 105mm L7 gun, replacing the 77mm HV gun on the real thing. This is likely because they didn't have a tier 8 tank, and the FV301 was too similar of a tank to add again just a tier above, so they did some WG trickery and falsified the tank.

There is no way in hell that a turret that resembles that of the Centurion Mk. I would have even thought of being mounted on a light tank of all things.

Pictures of the Vickers Medium Cruiser Mk. I (1, 2)

Blueprints

Vickers LT

A light tank project developed after the end of WWII. There is not much information I can gather from this. I feel like it may have been part of the FV300 project, as that was the only real light tank program after 1945, which would date this design to be from 1947 - 1950.

A picture of the tank