Work Horse, the M113 APC

by Martin Tingey

From M75 to M113:

The M75:

Constructed from welded steel and powered by an air cooled six cylinder, horizontally opposed AO-500-4 continental petrol (gasoline) engine with CD-500-4 cross drive transmission. The M75 was one of the first of it's type of carriers developed during the post WW2 years.

Fully loaded the M75 could carry twelve men. Ten fully loaded infantrymen, it's commander and driver, thereby giving it a combat weight of 41,500lbs. The M75 was originally developed and manufactured by the International Harvester Corporation. The Food Machinery and Chemical Corporation (FMC) were brought into the production programme, and a total of 1,729 vehicles were built by February 1954 when production of the M75 ceased; due in the greater part to it's high cost of 100,000 Dollars per vehicle.

M75

Crew	2-3 + 10
Weight (loaded)	41,500lb
Weight (empty)	36,669lb
Length	204.5"
Width	112"
Height	119.75"
Clearance	18"
Suspension	Torsion Bar
Speed	44 mph
Radius	115 miles
Engine	AO 895-20-4
Cylinders	6 In line
HP	127
Fuel cap	150 gal
Armament	Various
Armour (steel)	1/2" - 5/8"

The M59:

Design and development of a smaller, lighter APC was begun in 1951. The new vehicle was standardised in December 1953 and was designated the M59 Armoured Personnel Carrier. The M59 was much cheaper in it's production costs than the earlier M75, mainly due to the use of it's commercial twin liquid-cooled truck engines and transmissions. The use of a twin engine arrangement was however the downfall of the M59 as it proved to be so under powered that it had trouble keeping up with M48 tanks over rough terrain. The production of the M59 APC ran from February 1954 until 1960 when it ceased after just over 4,000 had been built.

M59

Crew	2+10
Weight (loaded)	42,600lb
Weight (unloaded)	39,504lb
Length	221"
Width	128.5"
Height	112.5"
Clearance	18"
Suspension	Torsion Bar
Speed	30 mph
Radius	125 miles
Engine	Pair of GMC 302
Cylinders	6 In line
HP	127
Fuel cap	136.5 gal
Armament	Various
Armour (steel)	1/2" - 5/8"

The T113:

After the Korean war had ended, those manufacturers that had been producing Aluminium for aircraft purposes began to look for other uses to apply their product to. In January 1956 the Army Ordanance Tank-Automotive Command (ATAC) initiated a programme to design and build a lightweight, Armoured personnel carrier, for Armoured and infantry units. The new APC had to be amphibious and capable of air-drop operations. Have good cross-country mobility, and be acceptable to multiple functions. Basically the Army wanted a "Jack of all trades".

Test Bed:

Within 90 days after the preliminary drawings had been completed, ATAC had a test bed built and running. Powered by an Ordnance air-cooled engine, with rolled aluminium plate armour for the hull. Although aluminium is a lot lighter than steel, it was found that pound-for- pound to gain comparable ballistic qualities it still had to weigh the same. This meant that aluminium armour had to be produced 3 times as thick as it’s steel counterpart. This was however a small price to pay as weight for weight aluminium is much stiffer than steel. This meant that structural braces and members could be eliminated which increased the internal volume. This in turn reduced the overall weight and height (by 3ft) of the vehicle, and also significantly cut down on the construction and welding times in manufacturing. After extensive tests on the test bed by the ATAC engineers, and after numerous problems had been resolved. The project was put out to tender in June 1956.

The FMC Corp:

In September of 1956 the successful contender, the ordnance Div of FMC Corp, was announced as the winner and contracted to build the new APC. Five prototypes (T113) were built using aluminium armour and powered by air-cooled Continental engines. A further five prototypes (T117) were also built using steel armour and driven by liquid cooled engines. By 1957 ATAC had received delivery of one of each of both types of hull (T113 aluminium and T117 in steel).

FMC working in conjunction with the Kaiser Aluminium and Chemical Corporation, constructed the T113 with an aluminium hull and a Continental air-cooled engine. These two combined together provided the lightest weight configuration and afforded the vehicle with a superior ballistic capability. At the same time a conventional steel hull vehicle was built, powered by a water-cooled Packard engine. This particular APC was derived from the earlier M59 and was built because it represented a low risk option.

During testing the Packard engine fell by the way side and was replaced by the Ford 368UC engine; However this engine itself was found to be unsatisfactory, requiring an increase in engine compartment space to help facilitate it’s cooling. As well as the problems faced with the Packard and Ford engines, the air-cooled Continental engine was also giving problems.

Two New Prototypes:

In late 1957 FMC developed two new types of prototype vehicles, these were designated T113E1 and T113E2. Both types were termed "austerity" vehicles as they were designed to keep costs down to a bare minimum. With this line of thought in mind it was decided to adopt cheaper commercially available powerplants and transmissions. This led to the Chrysler A710B being chosen because of it’s performance, good cooling characteristics, and more importantly - it would still be in production for a lot more years.

The transmission adopted was the Allison TX-200, this was also adopted because it was in widescale production, and it had an excellent track record in the truck industry. Two different hulls were developed which looked identical, but differed only in their armour thickness and weight. The purpose of this was so the Army could determine through ballistic and durability tests which of the two hulls to adopt. At the same time the tracks were widened from 12" to 15" to improve on the vehicles reliability and performance.

After successful testing the heavier of the two hulls, the T113E2, was chosen as the basis for the M113 APC.

The first production M113 APC rolled of the FMC assembly lines at San Jose California in June 1960.

M113:

Known as the "Green dragon" to the VC in the early stages of the war. The M113 was destined to become one of the most successful armoured vehicles of all time. Seeing action in Vietnam on a widescale from the DMZ to the Delta.

In 1962 the first M113s arrived in Vietnam and were given to ARVN units. In March 1962 a consignment of 32 M113s that were on their way to Europe were diverted and also given to the ARVN.

These first M113s were powered by a 209HP Chrysler 75M petrol engine. By 1964 the M113 had been superceded by the updated M113A1. The M113A1 was fitted with a General motor's 215HP Diesel engine which gave it an improved performance over the earlier M113.

Crew:

Each M113 had a crew of two, a commander and a driver, and could carry eleven men and their equipment. The driver sat on the L/H side of the vehicle, and had a good field of vision through four periscopes wich were mounted in the cupola. The commander was situated centrally in the vehicle and had a fully rotating cupola with five periscopes. The commander also acted as the gunner and operated the .50 cal machine gun, this could be rotated through a full 360 degrees to give an all-round field of fire if needed. The ammo for the 50 was stored in portable boxes behind the infantrymen's seats.

Originally the .50 cal gunners position was exposed and VERY unprotected. After the battle on Jan 2nd 1963 at Ap Bac, (in which fourteen ARVN M113 gunners had been killed) a combination shield and turret was designed which afforded much needed protection. This eventually was fitted as standard to all M113s.

Armour, Wheels and Tracks:

The cold rolled alloy hull of the M113 was made from Aluminium, Manganese and Magnesium. It's armour thickness varied from 3/4" to a maximum thickness of 1 1/4". This thickness provided protection from small arms fire and shell fragments, but would not stop a round from the soviet made RPG-7, or withstand the blast from a land mine.

One of the best features of the M113 was it's ability to operate in an amphibious roll with out the need of specialist preparation. The hull of the M113 was constructed as a watertight unit, with all hatches and doors fitted with rubber seals to make them watertight. The front of the vehicle was fitted with a hinged breakwater plate which helped to stabilize the vehicle during operations through water.

In the amphibious role the M113 was propelled by it's tracks, this was further enhanced by the rubber track shroud on each side of the hull, giving the M113 a top speed of 3 mph through water.

The 63-64 link tracks were 15" wide and of a swivel link type, housed in rubber bushings to give them maximum elasticity. The tracks themselves ran on ten pairs (5 each side) of 24" Aluminium road wheels which were in turn each fitted with a solid rubber tyre 2 1/8" thick.

The track life span on the M113 was supposed to be about 3,000 miles, but this was regularly exceeded, and has been known to go as high as 9,000 miles.

ACAV:

In 1965/66 some of the first M113s were converted into ACAVs (Armoured Cavalry Assault Vehicle) by fitting them with side mounted M60s and gun shields. Sandbags were placed on the floor of the inner troop compartment to absorb some of the blast from land mines. Sandbags were also placed on the outer hull and arranged as parapets around the troop compartment so as to allow the infantry to fire over the sides. As well as using sandbags for absorbing the blast from mines, ACAVs were also fitted with Titanium plates beneath the belly for the same reason.

Other mods to change the M113 into ACAVs involved ripping out all but the drivers seat, to make more room for the carrying of essentials like loads of ammo. The ammo was stacked two layers deep, and wall-to-wall in the troop compartment. As well as as much ammo as they could carry the ACAVs space was also filled with the crew's kit bags, spare gun barrels, water, C-rations, crew weapons, grenades, tool box, and a set of towing cables.

At a mere 22,000 Dollars per vehicle, the U.S Army had come up with a good all rounder. The M113 proved to be an excellent and effective Armoured Fighting Vehicle that went anywhere in vietnam and did everything - and more besides!

M113A1

Crew	2 + 11
Weight (loaded)	22,615lb
Weight (unloaded)	19,755lb
Length	191.5"
Width	105.75"
Height	86.5"
Clearance	16"
Suspension	Torsion Bar
Speed	44mph
Radius	200 miles
Engine	GM 215HP Diesel
HP	215
Fuel cap	95 Gal
Armament	Various
Armour	0.75" - 1.25"

Sources:- Mod US Armoured Support Vehicles R.J.Icks
M113 in action/Squad signal S.Tunbridge
Armour in Vietnam/Squad signal J.Mesko

Vietnam Mission/Pilot comms
The M113 Series/Osprey.Vanguard S.Dunstan
Nam/Orbis publishing

MARTIN......A non vet, a collector and interested party.

Martin Tingey , Got Zips in the wire!!!/ Phu Bai is alright !!!

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