

TO WAR *in Stuart Tanks*

The 2/6th Australian Armoured Regiment in Papua

In 1939, warfare at its most potent involved the use of tanks. The Australian Tank Corps operated Vickers tanks: four Medium Tanks Mk II and 10 Light Tanks Mk VIA. However, 'potent' was not a word that you would associate with these tanks. Having stood shoulder-to-shoulder with Great Britain in declaring war on Germany in September, Australia had now to decide whether it would deploy an army largely made up of infantry or one including tanks more modern than the obsolete Vickers tanks.

Lt Col Ronald Hopkins, the only Australian officer serving who had a working knowledge of modern tanks, was able to draft coherent ideas as to how Australia could build an armoured force. His work led to the formation of the Australian Armoured Corps on July 9, 1941. The quickest way to get tanks into the hands of the Australian Armoured Corps was to obtain tanks from US manufacturers and Australian requirements were added to the orders that Britain was placing. In due course, the Australian

Armoured Corps would receive Light Tanks M3 (Stuart, in British and Australian parlance) and Medium Tanks M3 (Grant and Lee).

6th Armoured Regiment

The Armoured Corps as originally conceived would require officers and men for 1st Armoured Division for service overseas and two Armoured Brigades for home defence. 1st Armoured Division would comprise two Armoured Brigades, each comprising three Armoured Regiments, plus motorised infantry and artillery.

It is the experiences of 6th Armoured Regiment, 1st Brigade, 1st Armoured Division, which are of interest to us here. It was planned that the 1st Armoured Division would deploy to the Middle East to fight alongside the British (and the Australian infantry already there) in mid-1942.

But, the Japanese attack on Pearl Harbor in December 1941 utterly changed the war situation. The intention to deploy 1st Armoured Division to the Middle East was abandoned in favour of defending Australia from invasion by the Japanese. The first examples of the Light Tank M3 (Stuart) were issued to the regiment in March 1942 and further issues followed, as did an issue of four Marmon-Herrington light tanks. The Marmon-Herrington tanks, underpowered and armed only with machine guns, were a stopgap only. As Stuarts were taken on



These Stuart I tanks are serving with Regimental Headquarters, 2/6th Australian Armoured Regiment, and are seen on exercise in northern New South Wales in early September 1942.
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strength, the Machine Gun Carriers were handed in. The last of the regiment's war establishment of 52 Stuart tanks arrived in July 1942.

Light Tank M3

The Light Tank M3 was an evolutionary design, being part of a steady series of improvements of the Light Tank T2 and the very similar Combat Car T5 (a tracked vehicle not described as a tank for legal reasons) built for the US Army's infantry and cavalry respectively in 1934. Production of the M3 began in March 1941. Most of the tanks issued to 2/6th Australian Armoured Regiment were the petrol-engined early version of the tank designated Stuart I by the British.

These tanks had either a polygonal turret built up from welded armour plates or a round one formed from rolled armour plate. Both

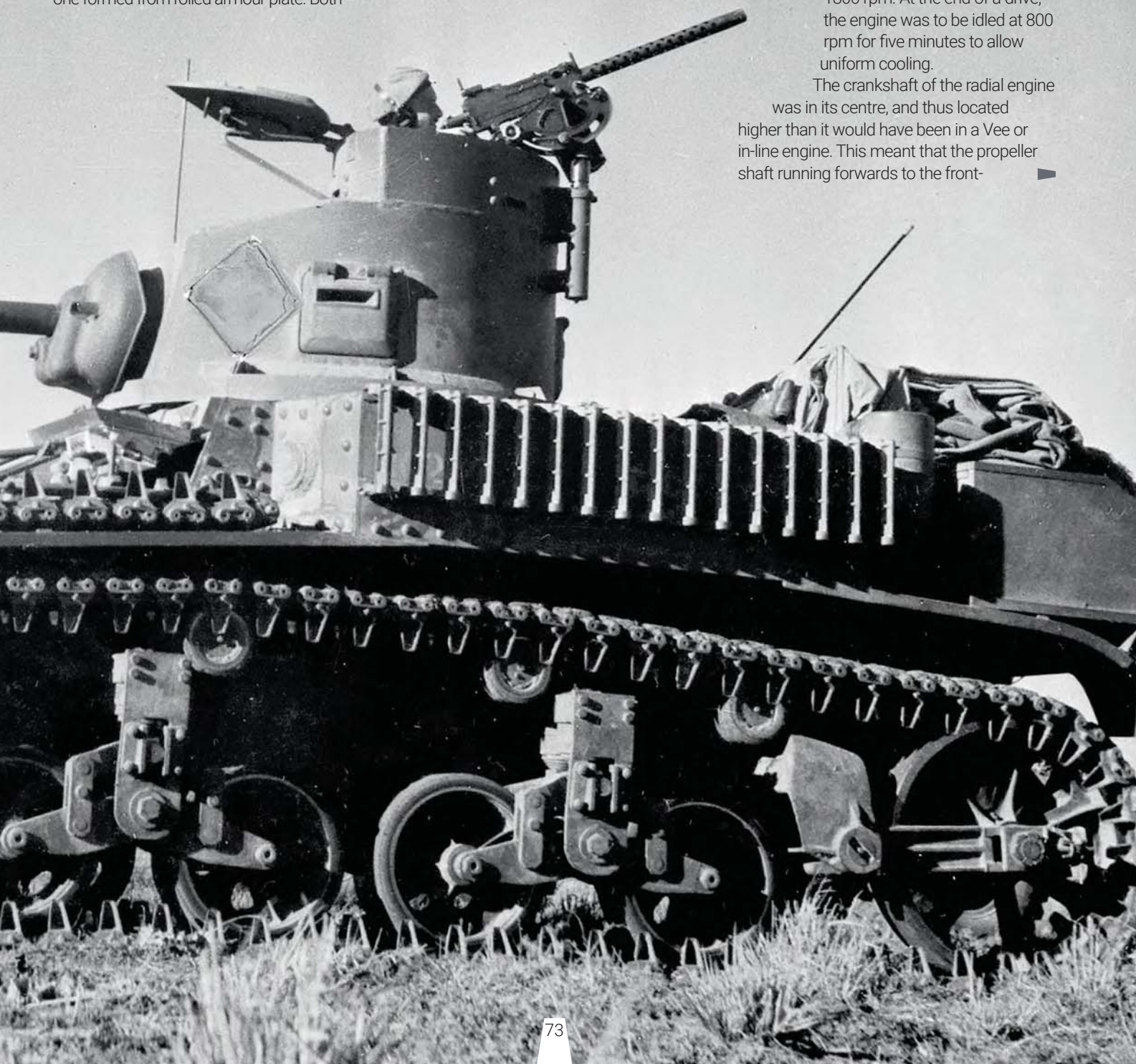
turrets had a cupola for use by a member of the turret crew when acting as tank commander. The hatch in the cupola was the only means of ingress to the turret from the outside. A smaller number of the regiment's tanks were the petrol-engined Stuart Hybrid. This tank had a round turret but no cupola – a periscope was fitted in place of the latter. This turret had two hatches.

The engine of the Stuart I and Stuart Hybrid was a Continental W670 Series 9A seven-cylinder radial, originally designed for use on aircraft, developing 250bhp at 2,400rpm. It required petrol with a minimum octane of 80, which was higher than was used by military trucks and lorries. With it being impracticable to provide two types of petrol, in June 1942 the US Army Ordnance Corps and British War Office made the decision to standardise on 80

octane petrol; MT80 was issued as standard from April 1943.

The W670 Series 9A engine was air-cooled, which meant that there were no radiator and associated hoses to leak, but it did mean that the engine cooling fan sapped power and was very noisy. The air-cooled engine also required careful management by the driver. According to the Technical Manual, before starting the engine had to be hand-turned 45 revolutions in order to pump oil around it. If engine oil had leaked into the combustion chamber of the lowest cylinders and caused a hydraulic lock, this had to be drained by removing the spark plugs of the three lowest cylinders. Once started, the engine had to be warmed up for 15 to 20 minutes at 800 – 1000 rpm. For the first two or three miles driving, the tank was to be run in second or third gear at 1600 – 1800 rpm. At the end of a drive, the engine was to be idled at 800 rpm for five minutes to allow uniform cooling.

The crankshaft of the radial engine was in its centre, and thus located higher than it would have been in a Vee or in-line engine. This meant that the propeller shaft running forwards to the front- ▶





Australian wartime tactical marking of tanks broadly follows the system adopted by the British. This is a representation of the tactical mark carried by the tanks of 2/6th Armoured's C Squadron. The hollow circle is painted yellow; the circle identifies the regiment's C Squadron and the yellow paint indicates the second regiment in a brigade. A Squadron used a hollow triangle as a tactical mark, and B Squadron a hollow square. The 10, in white, indicates 10 Troop; troops were numbered consecutively through a regiment

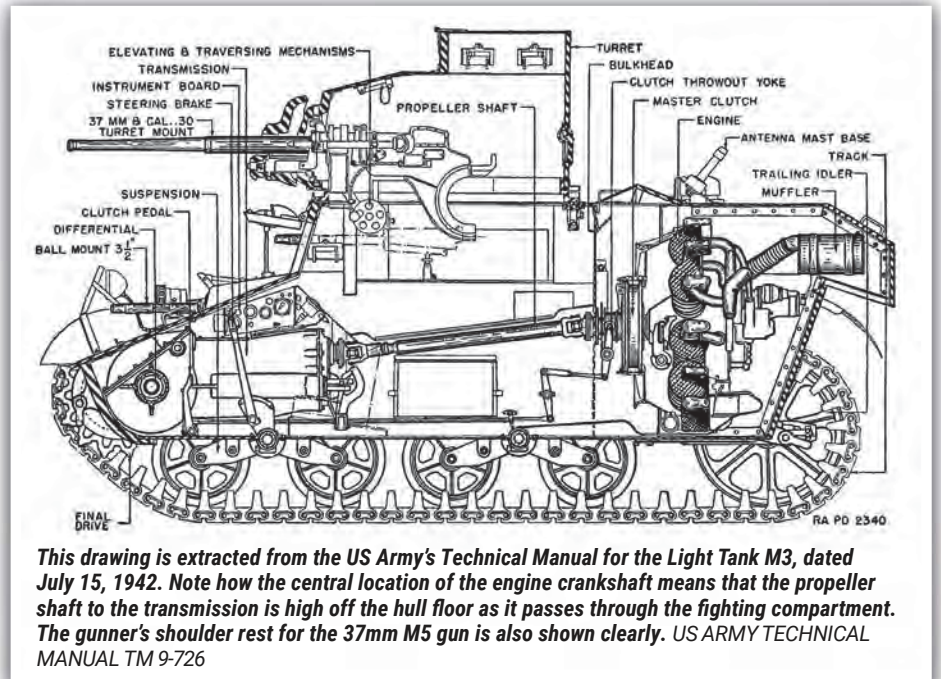
'The Light Tank M3 was an evolutionary design'



As well as using its tanks to provide fire support, 2/6th Armoured used them to re-supply the accompanying infantry on the battlefield as seen here. GEORGE SILK / LIBRARY OF CONGRESS, PRINTS AND PHOTOGRAPHS DIVISION, FSA/OWI COLLECTION



This is Capt Norman C Whitehead, officer commanding the detachment from 2/6th Australian Armoured Regiment. The wartime censor has obscured the C Squadron tactical marking. LIBRARY OF CONGRESS, PRINTS AND PHOTOGRAPHS DIVISION, FSA/OWI COLLECTION



This drawing is extracted from the US Army's Technical Manual for the Light Tank M3, dated July 15, 1942. Note how the central location of the engine crankshaft means that the propeller shaft to the transmission is high off the hull floor as it passes through the fighting compartment. The gunner's shoulder rest for the 37mm M5 gun is also shown clearly. US ARMY TECHNICAL MANUAL TM 9-726

mounted transmission was located higher too, especially at the engine end. This made things awkward for the two-man turret crew.

In action the two crewmen stood on the hull floor, the gunner to the left of the gun and the loader / wireless operator to the right. If they traversed the turret, they had to watch their footing as they stepped over the cover enclosing the propeller shaft. It often proved easier simply to use the intercom (part of the No 19 wireless set as installed in British and Australian Stuarts) to instruct the driver to turn the entire tank. The turret traverse wheel was worked by the loader under the gunner's instructions (though in British and Australian service the wheel was often moved to the gunner's side of the gun). It was difficult to be precise with this arrangement, so the gun was in a mounting that allowed the gunner to use his shoulder to traverse it independently of the turret up to 10 degrees right and left. The gunner elevated the gun using a hand wheel.

Having only a two-man turret crew meant that the gunner also had to serve as tank commander. In his role as tank commander, he observed the battlefield from his cupola on the turret. When he decided to engage a target, his view of the battlefield shrunk to that very small part of it that he could see through his gunsight. This meant that he lost situational awareness – a potentially fatal loss on a battlefield occupied by fast-moving enemy tanks. The Australian Armoured Corps therefore added a third man to the turret crew so that there were individual crewmen serving as commander and gunner.

Seated side by side at the front of the tank were the driver (left) and hull machine gunner (right). To overcome the disadvantage of the two-man turret crew, the British sometimes moved the hull gunner up into the turret to form a three-man turret crew. Both driver and

hull machine gunner had their own hatch in the front of the glacis, though both men could wriggle backwards out of their seats and climb up through the turret to exit via the hatch or hatches if necessary.

The main gun as originally fitted to the Stuart was the 37mm Gun, Tank, M5. The later issues to 2/6th Armoured were probably fitted with the improved 37mm Gun, Tank, M6, which had a conventional mounting. In addition, there was provision for five .30 machine guns: coaxial with the main gun; in a ball mount on the glacis; fitted as required in an anti-aircraft mount on the rear face of the turret; in both right and left hull sponsons.

These last two machine guns, fixed in place, were intended to be fired by the driver. However, as they could only be aimed by turning the entire tank left or right, they were regarded as relatively useless. In Australian (and British) practice, they were not fitted. The apertures in the sponsons were covered by a piece of armour plate welded in place.

The 37mm gun was provided with both high explosive and armour-piercing rounds (plus, from circa 1942, a canister round). The high explosive round proved to be particularly useful, given that contemporary British tanks fitted with the two-pounder gun were provided with armour-piercing rounds only. The AP rounds fired by the 37mm gun M5 would penetrate 1.5in (38mm) of armour at a range of 1000yds (900m). The Stuart's own armour was this thickness on the front of the hull and turret, thinner elsewhere. Thus during the war years, the Stuart I could engage on more or less equal terms Italian, Japanese and German light tanks; the Stuart I could also engage early versions of the Panzerkampfwagen III, though not the later versions which had thicker armour and a more powerful gun – and these were the versions

that it was likely to encounter on the battlefield.

The Stuart was vulnerable to attack by the German 37mm anti-tank gun, and that vulnerability increased exponentially when the Germans introduced larger-calibre anti-tank guns as the war progressed.

To sum up, the Stuart was at least as well armed and armoured as other contemporary light tanks. However, the Germans concentrated their tank construction on medium and heavy tanks which outclassed the Stuart in terms of armour and the power of their guns. The Stuart was reliable and driven by a powerful engine. A weak point in automotive terms was limited range due to the small fuel tanks, so the British and Australians specified auxiliary fuel tanks (which could be readily jettisoned).

New Guinea

New Guinea lies to the north of Australia. In 1942, the western half formed part of the Dutch East Indies, the eastern was divided into the Territory of New Guinea and the Territory of Papua, both of which were administered by Australia. Japanese troops landed on the north coast of Papua in July 1942. The troops were under orders to advance some 60 miles (100km) south along the Kokoda Track, through the Owen Stanley Range and then to seize Port Moresby on the south coast of Papua.

Military authorities decided to strengthen the defences of Port Moresby by sending tanks to deploy in the vicinity of the town. On September 11, 1942, the senior armoured regiment of 1st Australian Armoured Division was warned to prepare for deployment. However, staff officers then realised that the regiment's Grant medium tanks were too heavy to be handled by the port's facilities.

The second senior regiment in the division was 2/6th Australian Armoured Regiment. As described above, the regiment had trained with the Stuart light tank and these could be handled at Port Moresby. However, the regiment had just handed them in and received an issue of Grant tanks instead. Fortunately, the Stuart tanks were still accessible – the regiment took them back again.

A Squadron landed at Port Moresby on September 28. Soon afterwards, B Squadron deployed to Milne Bay, and C Squadron and Regimental HQ deployed to Port Moresby. Signallers and the Light Aid Detachment also deployed with the regiment.

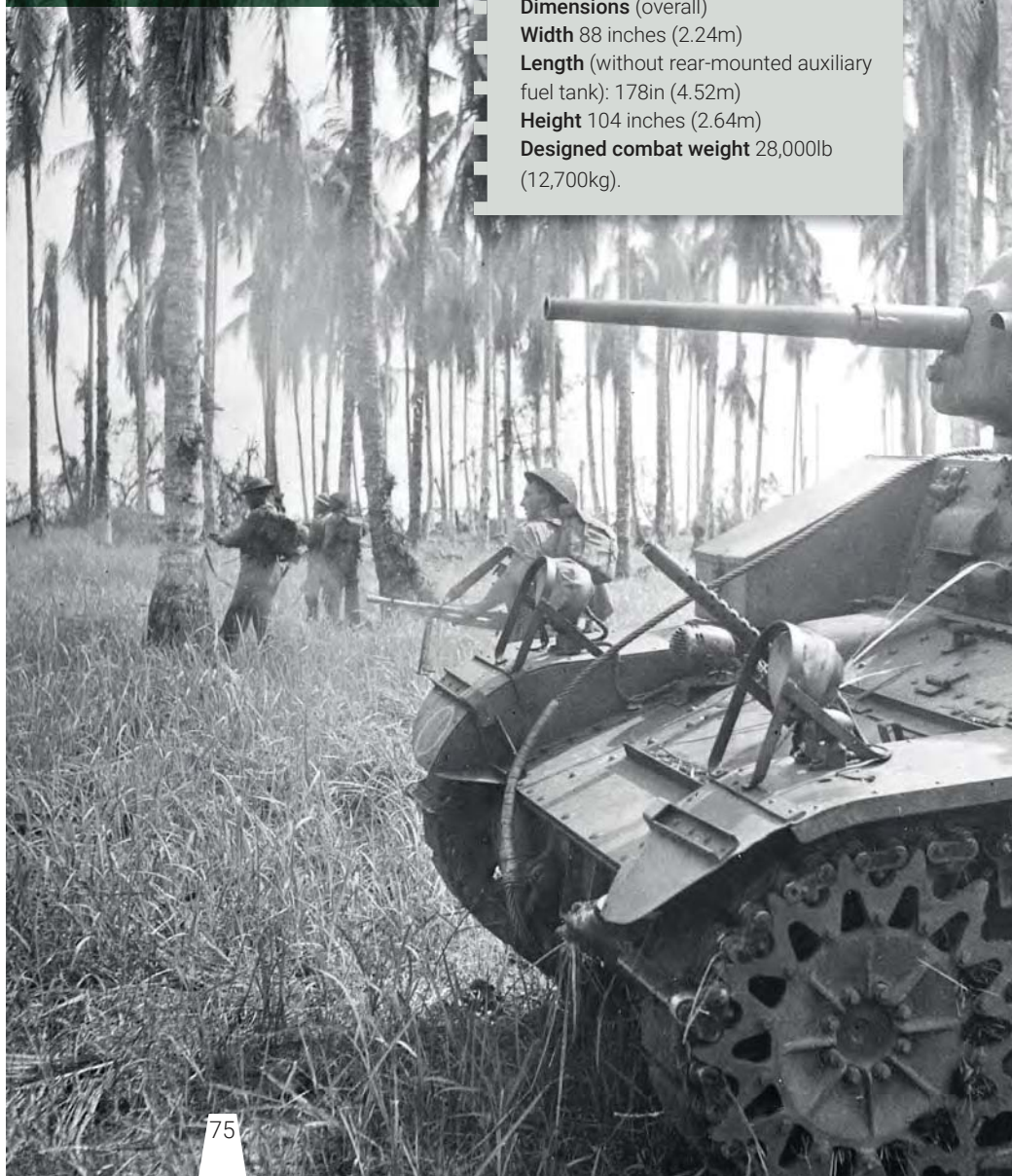
In November, B Squadron was ordered to despatch a troop of tanks north along the coast from Milne Bay using barges captured from the Japanese. These tanks would attack the Japanese flank. However, the Stuart was getting on for twice the weight of the Type 95 tank; when the attempt was made to drive a Stuart on to a barge, it sank. In desperation, Australian machine gun

carriers were deployed to spearhead the attack on the Buna bunkers. The snipers who had held at bay the field artillery picked off the crews of the open-topped carriers. No progress was made, though many more men lost their lives.

The situation was getting desperate for the Allies, so it was decided to try again with the tanks. This time, barges with enough capacity would be employed. His Majesty's Transport Kersik took on board four of C Squadron's tanks at Port Moresby, then steamed to Milne Bay to pick up four more tanks from B Squadron. The ship then steamed on round the coast to Oro Bay, where the tanks were unloaded on to barges. Launches and tugs towed the barges further up the coast, where the tanks were put ashore.

Ground conditions were very poor – glutinous mud was frequently encountered, so the tank crews fitted spuds (otherwise known as grousers) to the tracks. The spuds comprised steel bars the same width as

2/6th Armoured's Stuart I 'Binalong' in action at Giropa Point on New Year's Day, 1943. Note the hull machine gun at full elevation to engage snipers at the top of coconut palms. GEORGE SILK / LIBRARY OF CONGRESS, PRINTS AND PHOTOGRAPHS DIVISION, FSA/OWI COLLECTION



SPECIFICATIONS

Model Stuart I
Manufacturer American Car & Foundry
Built from March 1941
Speed highway 31 mph (50kph)
Speed, cross-country: 20mph (32kph)
Cruising range Up to 75 miles (120km)
Engine Continental W670 Series 9A, seven-cylinder radial, four-stroke, air-cooled, petrol-fuelled. Piston displacement: 667.86 cubic inches (10.94 litres)
Horsepower 250bhp at 2,400 rpm
Transmission synchromesh, five forward and one reverse gears. Controlled differential steering by twin levers
Crew Five, though designed for only four.

Armour

Frontal and turret armour Up to 1.5in (38mm)
Side armour 1-inch (25mm)
Armament 37mm gun, M5 or M6. Stowage for 103 rounds. One .30 machine gun co-axial with main gun. One .30 machine gun in ball mount in front glacis plate. One .30 machine gun in anti-aircraft bracket mount on rear of turret (detachable)

Dimensions (overall)

Width 88 inches (2.24m)
Length (without rear-mounted auxiliary fuel tank): 178in (4.52m)
Height 104 inches (2.64m)
Designed combat weight 28,000lb (12,700kg).



When attacking through undergrowth as thick as this, 2/6th Armoured's tanks rely on the infantry to deal with Japanese soldiers creeping forward with magnetic mines or satchel charges. LIBRARY OF CONGRESS, PRINTS AND PHOTOGRAPHS DIVISION, FSA/OWI COLLECTION

the tank tracks; bolted to the outer faces of the tracks, they greatly improved grip in soft going.

The terrain in which the tanks would have to fight was challenging. Dense stands of forest or coconut palm lay ahead and any open ground was covered in a thick, coarse growth of kunai grass, anything up to 4ft tall. The local climate was challenging too – high temperatures, made worse by high humidity. Also challenging was the fact that 2/6th Armoured had not yet trained to work closely with infantry. The tank officers and the officers of 2/9th Australian Infantry Battalion therefore put their heads together to come up with a plan for tank – infantry communication.

The officers devised a system of hand signals for use by the infantrymen and a code of coloured Verrey lights for use by the tanks. The officers also reconnoitered the intended battleground, though there was little that could be made out due to the thickness of the vegetation. The Japanese positions to be attacked were on their left flank; the Australian plan was to chew away at that flank and thus eventually to drive through to Buna and beyond.

The attack

Tanks and infantry moved up to the start line early in the morning of December 18, 1942. 2/9th Australian Infantry Battalion formed up on a three-company front, with one company in reserve. Three tanks supported the infantry company on the right and another three the company in the centre. Each group of three tanks was formed up with two in line abreast with the third close behind; the third tank would support the tanks in the front row or take the place of one of them should it be knocked out. Of the two remaining tanks, one was used by Capt Whitehead as a command tank and

the other was kept as a spare. The attack began at 7am, and immediately the infantry began to suffer casualties. The attack rolled on, however, with tanks and infantry offering close support. The nature of the ground being as it was, tank drivers had to continually steer round obstacles. When an obstacle such as a tree stump had to be surmounted, it often proved necessary for the driver to slip the clutch in order to travel sufficiently slowly. On this first day of battle, brake and clutch wear would not be an issue, but they would be as the campaign progressed.

Tanks drove to within 10 to 15ft of a Japanese bunker, while closely accompanied by infantry. Determined Japanese soldiers could easily get close enough to a tank to attack it with magnetic mines or satchel charges. On one occasion, a Japanese soldier managed to jump on to a tank and fire his rifle point blank at an armoured glass vision slit in the turret. The tank crewman behind was injured by shattering glass; the soldier was shot down. When a tank was close enough to a bunker for the gunner to see the firing slit, he tried to increase the size of it by firing armour-piercing rounds at the coconut palm logs that defined it.

Once he was confident that he could get a high explosive round through the slit, one was loaded, and the gunner kept on firing. Meanwhile, the tank's bow machine gunner sprayed bullets at the bunker's likely exits to cut down any occupants who tried to flee.

Once the main gun began firing, the hot and humid conditions inside a tank quickly got worse. There was a fan to expel foul air, but this was not effective with the turret hatch closed – and it had to be closed, due to the constant menace of Japanese snipers in treetops. The smoke accumulating in the tank made the crew's eyes water, so that the gunner found it difficult to be focus his gunsight.

Two tanks bellied out when they straddled coconut palm logs; the diameter of a fully-grown palm was about the same as the ground clearance of a Stuart tank.

Both tanks were then attacked by the Japanese who tried to set fire to the grass beneath them. Both crews managed to escape unscathed. One tank was completely burned out, the other survived to be recovered. Another tank was burned out when a Japanese soldier managed to attach a magnetic mine to the hull; again, the crew escaped unscathed.

The aftermath

During the day's fighting, tanks returned to the start line as required for more fuel and ammunition. As the tanks had gone into battle together, they all tended to have to replenish at the same time. On future occasions, 2/6th Armoured would stagger the deployment of tanks into battle so that the infantry was not left unsupported when tanks had to replenish.

On this day, however, the infantry had to sit tight while the tanks were away. By 3pm, the Japanese in the bunkers under attack had had enough; the survivors slipped away to the next prepared position behind.

The Stuart had not proved to be ideal for the fighting in the jungle, being relatively thinly armoured as compared with the Matilda II which in later campaigns the Australian Armoured Corps would prefer to use for jungle fighting. But in Papua, the Stuarts and their crews had proved their worth. ◀

Further Reading

Technical Manual Light Tank M3, TM 9-726 dated July 15, 1942; and The Vital Factor: A History of the 2/6th Australian Armoured Regiment 1941 – 1946. Paul Handel. ISBN 1-876439-61-0.

Stuart I tanks of 2/6th Australian Armoured Regiment on exercise in northern New South Wales in early September 1942. LIBRARY OF CONGRESS, PRINTS AND PHOTOGRAPHS DIVISION, FSA/OWI COLLECTION

