HELICOPTER BATTLEFIELD SURVIVABILITY
By
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'...Used properly, the helicopter was not the fragile target some doom-forecasters had predicted...'

- LTGEN John. J. Tolson, US Army Vietnam Studies: Air Mobility, 1961-1971

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Total US forces helicopter losses of all types in Vietnam War: **4,869**

Total Iroquois lost by US Army: **2,591**

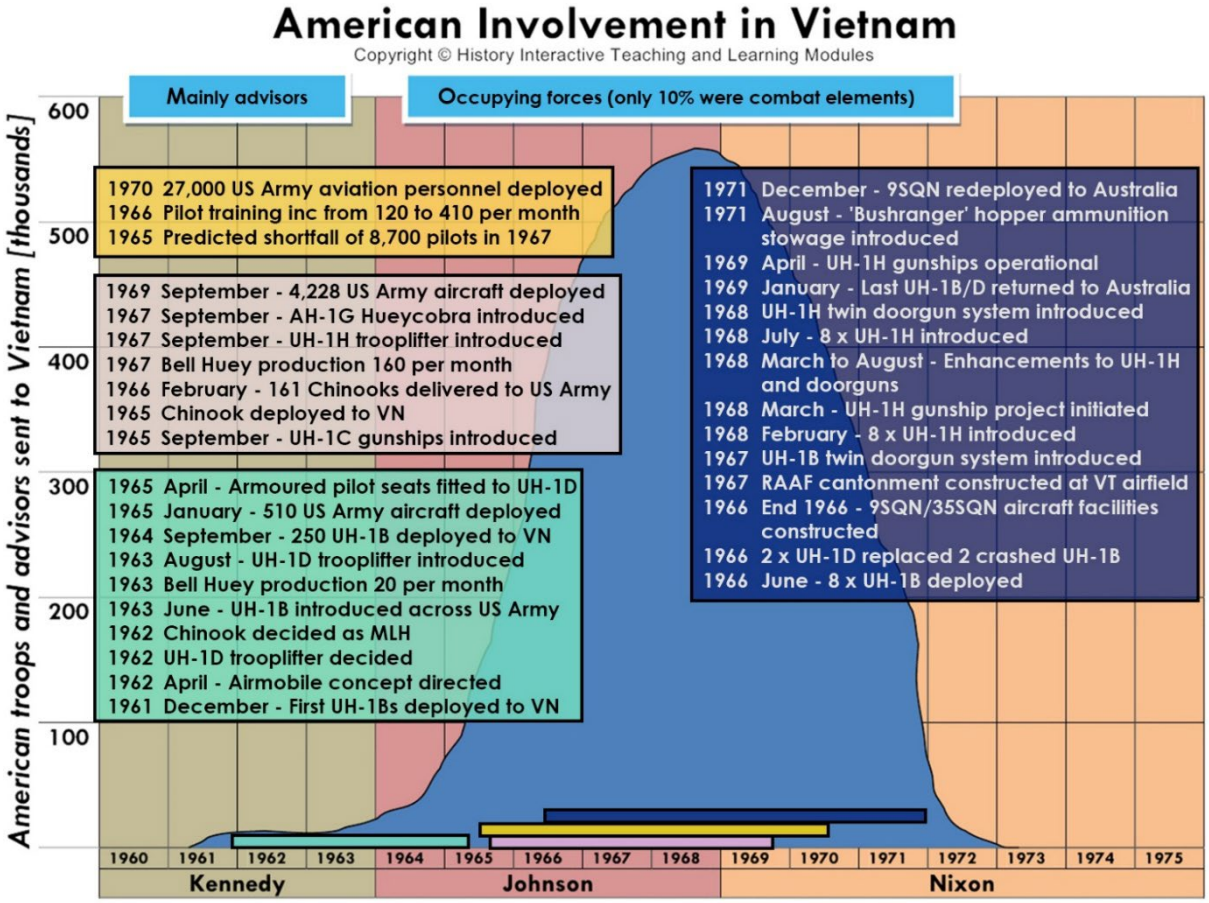
Iroquois lost by US Army in combat: **1,211**

Iroquois lost by US Army in operational accidents: **1,380**

Hueycobras lost overall: **271**

Operator	Hit by groundfire	Downed due groundfire	Lost by groundfire
US ARMY	1 in 1,147	1 in 13,641	1 in 21,194
9SQN RAAF	1 in 9,146	1 in 79,270	1 in 237,806

Sortie statistics in this foregoing table embrace all helo types and models operated. 9SQN flew 237,806 sorties for 58,768 hours during 2,000 days of Vietnam War operations.



Note the huge increases in US Army pilot training between 1965 and 1970 as shown in the Yellow text box. The adequacy of training may have been a consideration in the

1,380 Iroquois lost in operational accidents, being 53 percent of Huey losses. Losses in training accidents were also very high during WW2.

A high percentage of 1,211 US Army Iroquois combat losses were probably due to the folly of air assault landings of troops on known enemy occupied locations.

Groundfire Weaponry

The primary threat in South Vietnam (SVN) was from 7.62mm which could be largely avoided during flight about 1,500 feet above ground level (AGL). 12.7mm weaponry was also available throughout SVN but generally selectively used by opposition forces. This heavier calibre was effective to near 5,000 feet AGL.

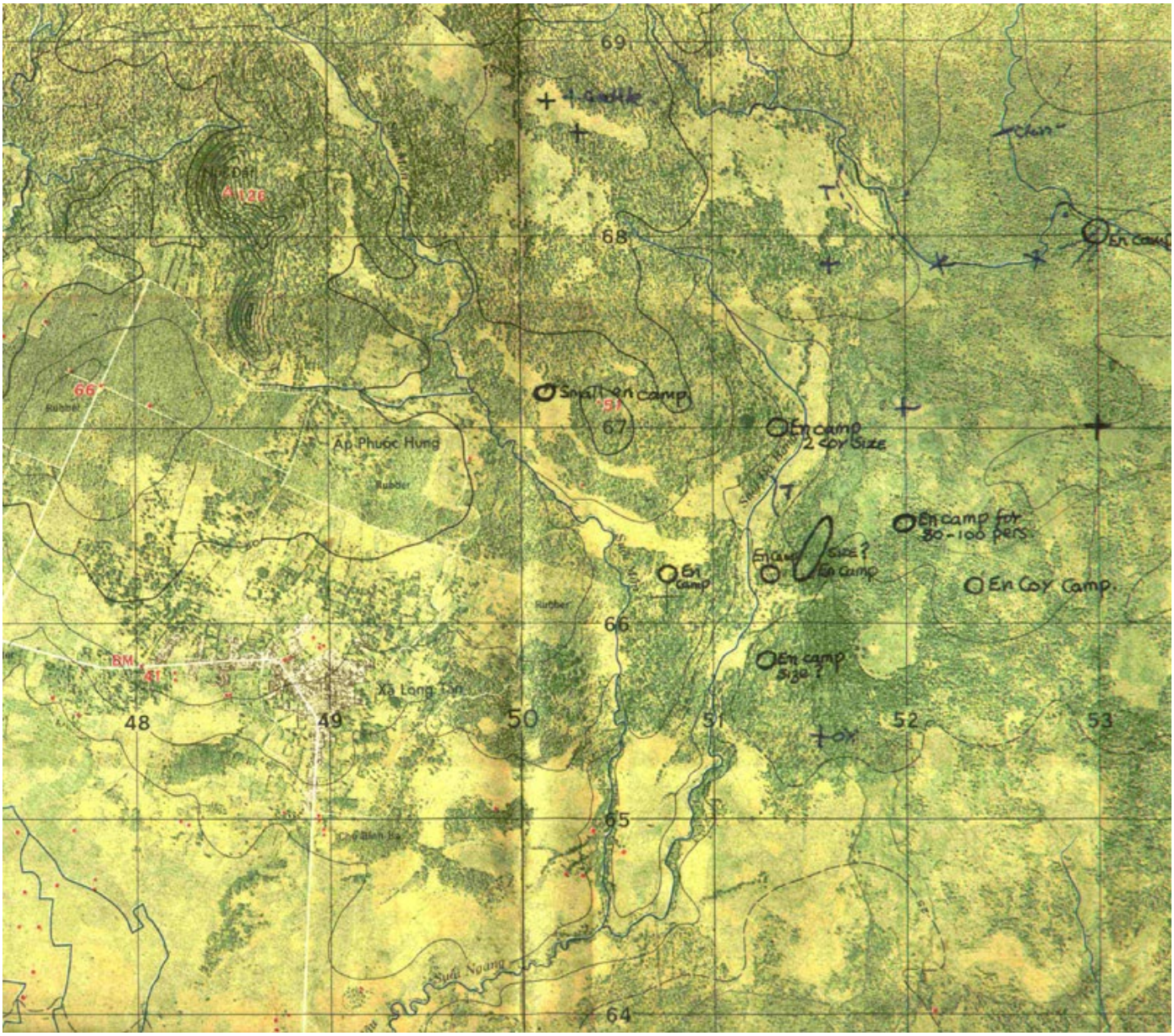
12.7mm Anti-aircraft Weapon

Near the lower end of the Ho Chi Minh trail, there were more formidable anti-aircraft defences (14.5mm, 23mm, 37mm, 57mm weaponry) than the 12.7mm common throughout most of South Vietnam (SVN). See: https://www.historynet.com/north-vietnams-light-anti-aircraft-artillery/

Risk of being hit by groundfire during transit flying in SVN was generally very low, but much higher in hovering situations during enemy engagements for casevac and ammunition resupply missions. Intimate suppression from helicopter gunships was often desirable in such close quarters combat situations although reliance on basic Iroquois defensive weaponry was sometimes necessary where gunship support was not involved.

Low Level Navigation

1:25,000 Pictomaps enabled pretty accurate visual navigation at low level but this was not common practice. 9SQN Iroquois at that time were not equipped with a tactical navigation system or GPS.



Generally, Hotel model Iroquois were operated at about 80 to 90 knots as higher airspeeds adversely impacted door-gunner functionality. Aiming at helicopters moving at that speed is a complex continually changing 4 dimensional problem including time and estimation of range especially is often erroneous. Target crossing speed was roughly 41 to 46 metres per second.

So-called 'Nap of the Earth' flying right on treetops is unnecessary in my view and a 9SQN aircraft hit a large dead tree in flight breaking a SAS trooper's leg. Flight at about 50 to 100 feet above treetops allows flaring to kill forward speed in the event of engine failure to enhance survivability prospects if crashing into vegetation.

Rocket Propelled Grenades

Rocket Propelled Grenades (RPG2 & RPG7) were used very effectively against allied ground forces in Vietnam but were often fired ineffectively at helicopters, the aiming solution differing from gun weaponry firing due to projectile velocity and gravity drop.

RPG 7

A 1976 U.S. Army evaluation of the weapon gave the hit probabilities on a 5 x 2.5-metre panel moving sideways at 4 m/s. Crosswinds cause additional issues as the round steers into the wind. In an 11 km/h wind, firing at a stationary tank sized target, the gunner cannot expect to get a first-round hit more than 50% of the time at 180 m (Wikipedia). The probability of hitting a moving helicopter would be much less.

I recorded being engaged by RPGs on 5 occasions seeing only 1 myself with the other 4 being called by door-gunner crew. Doubtless there were more that we did not sight.

There have been over 100 user States of the RPG-7 with widespread world manufacture of improved variants.

MANPADS

Since the Vietnam War, MANPADS (Man-Portable Air Defence Systems) have become a game changer. They are vulnerable to detection and counter-attack if vehicle mounted, especially by drones (UAVs), but are arguably more of a threat to helicopters if infantry borne.

Helicopters in transit flight at low level will usually only present a fleeting opportunity for target acquisition and firing by a MANPAD operator. Most missiles are passive infra-red seekers requiring a few seconds of positive lock-on for successful firing. Battery packs for MANPADS have a finite single use life and missile propellant deteriorates over time so sustainability of the weapon in remote operating environs is problematic. **Nevertheless, MANPADS pose a significant influence on helicopter operating practices.**

Vietnam War Lessons

I believe that military helicopter operations at about 50 to 100 feet above vegetation or ground level afford acceptable lower risk of being engaged by groundfire or MANPADS.

Some argue that escort by gunships is essential for trooping helicopters but not cost-effective in my opinion, except for special roles. Mutual cross-cover fire support from door-guns is inherent when operating in loose widespread tactical formations.

An obvious question is why does Australian Army Aviation need 13 Heavy Lift Chinooks, 40 Medium Lift Blackhawks and 29 Apache Attack platforms when helicopter operations akin to Vietnam War concepts are not viable militarily?

Armies worldwide must shed the dogma of moving largish formations (platoons, companies, battalions) by helicopter or whatever and instead focus more on squad/section tactics as recommended in US Army post-Vietnam War studies.

Military operations must be conducted cost-effectively minimizing risk of aircraft and personnel losses.

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