

machine gun platoon, and almost 18,000 pounds of equipment were brought in using 12 helicopters requiring a total elapsed time of about four hours. The bulk of the equipment and supplies were delivered by suspended cargo nets, which had to be released on top of the mountain because the hillsides were so steep. This took place in full view of the enemy, but no helicopters were hit by enemy fire. The final touch was the airborne laying of two telephone lines in about a quarter hour from Hill 884 to the ground command post more than eight miles away. This would have been a daylong task for a wire party on foot. The event was headline news in the States, and congratulations from higher headquarters poured in: General Shepherd noted Operation Summit was "a bright

new chapter in the employment of helicopters"; and X Corps commander Major General Clovis E. Byers claimed: "Your imaginative experiment with this kind of helicopter is certain to be of lasting value to all the Services."

### Holding the Minnesota Line

In late September 1951, the United Nations Command once again halted offensive operations. All across the trans-peninsular frontline troops began digging in. Soon, a series of interconnected trenchlines reminiscent of World War I extended from the Sea of Japan in the east to the Yellow Sea in the west, and the U.S. Eighth Army was prohibited from launching new attacks. Ground activities were limited to conducting daily foot patrols, mounting tank-

infantry raids, manning small outposts, and setting up nightly ambushes. The overriding tactical concern was a penetration of the main line of resistance by the Communists. The war in Korea had once again entered a new phase; but, unlike the others, this one would last from the fall of 1951 until the ceasefire almost two years later.

The 1st Marine Division was assigned 22,800 yards of front along the northern edge of the Punchbowl with orders "to organize, construct, and defend" the Minnesota Line. Much of the main line of resistance ran through roadless mountains, and the reserve regiment was located almost 17 miles to the rear. With his manpower stretched to the limit and terrain and distance limiting rapid overland reaction by reserve

*An aerial view of auxiliary airfield X-83 located near Chodo-ri, not far from 1st Marine Division headquarters.*

*Both helicopter squadrons (VMO-6 and HMR-161) shared this forward airfield situated near the Punchbowl.*

HMR-161 Historical Diary Photo Supplement, Nov-Dec51





National Archives Photo (USMC) 127-N-A132540

*All veteran World War II fighter pilots, the officers of Marine Helicopter Transport Squadron 161 pose with their commanding officer, LtCol George W. Herring, kneeling in*

*front left, and the squadron's executive officer, Maj William P. Mitchell.*

forces, General Thomas turned to HMR-161 to help solve his time and distance problems. He decided to test-lift a single rifle company. In addition, since most Chinese attacks occurred under cover of darkness, this helicopter lift would take place at night.

Once again careful planning and detailed rehearsals were conducted. Fortunately, the HRS-1, unlike the light utility helicopters of VMO-6, had flight attitude instruments, albeit not the sophisticated instrumentation found on fixed-wing aircraft. Daylight reconnaissance of the operational area, day-

time practice inserts, and night indoctrination flights were conducted. The helicopter embarkation zone was a dry riverbed southeast of Hill 702, and the landing zone was located near the northwest rim of the Punchbowl. The straight-line five-mile ingress route, however, actually became a 13-mile round trip due to tactical considerations.

A daylight rehearsal on the morning of 27 September got Operation Blackbird off to an inauspicious start. Six helicopters lifted more than 200 men into a 50-by-100-foot area cleared by a

provisional helicopter support team. This practice lift took about two hours. During the march out, however, a rifleman detonated an antipersonnel mine, and subsequent investigation revealed that the proposed route to the main line of resistance was seeded with unmarked mines. It was decided to change the ground scheme of maneuver but to keep the helicopter landing zone the same.

At 1930 on the 27th, Operation Blackbird, the first night combat helicopter troop lift in history, got underway. Departing at three-minute intervals as they shuttled

between the departure and arrival landing zones, each aircraft carried five riflemen. Different altitudes were used for ingress and egress to avoid collisions, and running lights were switched on for two minutes as aircraft neared the landing zones. Only two hours and 20 minutes were required to lift all 223 men, a movement that would have required at least nine hours by foot.

Unfortunately, there were many problems. Rotor wash blew out many of the flare pots that illuminated the embarkation area, battery-powered lanterns in the landing zone were inadequate, windshield glare temporarily blinded the pilots, artillery flashes distracted the pilots as they wormed their way through the high mountain ridges, and many in-bound pilots needed radio assistance to find the landing zone. As the squadron's after action report candidly stated:

"Night lifts are feasible with present equipment [but they] should be limited to movements within friendly territory." Although the operation was a marginal success that affirmed the possibility of emergency night reinforcement and intermittent night indoctrination flights continued, Operation Blackbird was the only major night helicopter troop lift conducted in Korea.

The next day, HMR-161 lost its first helicopter to an operational mishap. A dozen light helicopters (HO3S-1s and HTLs) had been previously lost to enemy fire and operational mishaps, but this was the first HRS to go down. The HRS-1 piloted by Major Charles E. Cornwell and First Lieutenant Frederick D. Adams came into the landing zone too low. The helicopter struck the ground, bounced into the air, canted on its side losing all lift, and then careened to

the ground and caught fire. The flaming helicopter was a total wreck, but both pilots escaped without injury.

The ability to rapidly move a single rifle company had been established by Operations Summit and Blackbird, so Thomas and Krulak were eager to see if the same principles could be applied to a larger lift. On 9 October, a warning order for Operation Bumblebee, the lift of an entire rifle battalion, was issued. Second Lieutenant Clifford V. Brokaw III, at that time an assistant operations officer with the 7th Marines, recalled that the genesis of the operation actually occurred much earlier when Colonel Krulak inquired if helicopters could support a frontal attack. Colonel Herman Nickerson, the regimental commander replied with a firm "no!" While in reserve, however, the regiment was tasked to prepare an amphibious contingency plan including a helicopter lift. Then, at Krulak's insistence, that plan was adapted to provide for the heliborne relief of a rifle battalion on the main line of resistance. Well aware that such a major helicopter event would become headline news, the division public relations officer asked what the operation was going to be called. Sergeant Roger Hanks, a former University of Texas football player, mindful of the many vociferous skeptics who questioned the viability of helicopters for combat duty, quickly piped up: "Bumblebee because supposedly they can't fly either."

Colonel Krulak headed the planning group that included Lieutenant Colonel Herring and Major Mitchell from HMR-161, Lieutenant Colonel Harry W. Edwards, the rifle battalion commander, and Lieutenant Colonel George G. Pafford, the shore party

*HMR-161 pilots and crewmen attend a pre-mission brief for Operation Blackbird, the first major night helicopter troop lift. Careful planning and rehearsals were conducted to test the feasibility of night helicopter operations; after action reports noted it was possible in an emergency, but Blackbird was the only night belift actually carried out.*

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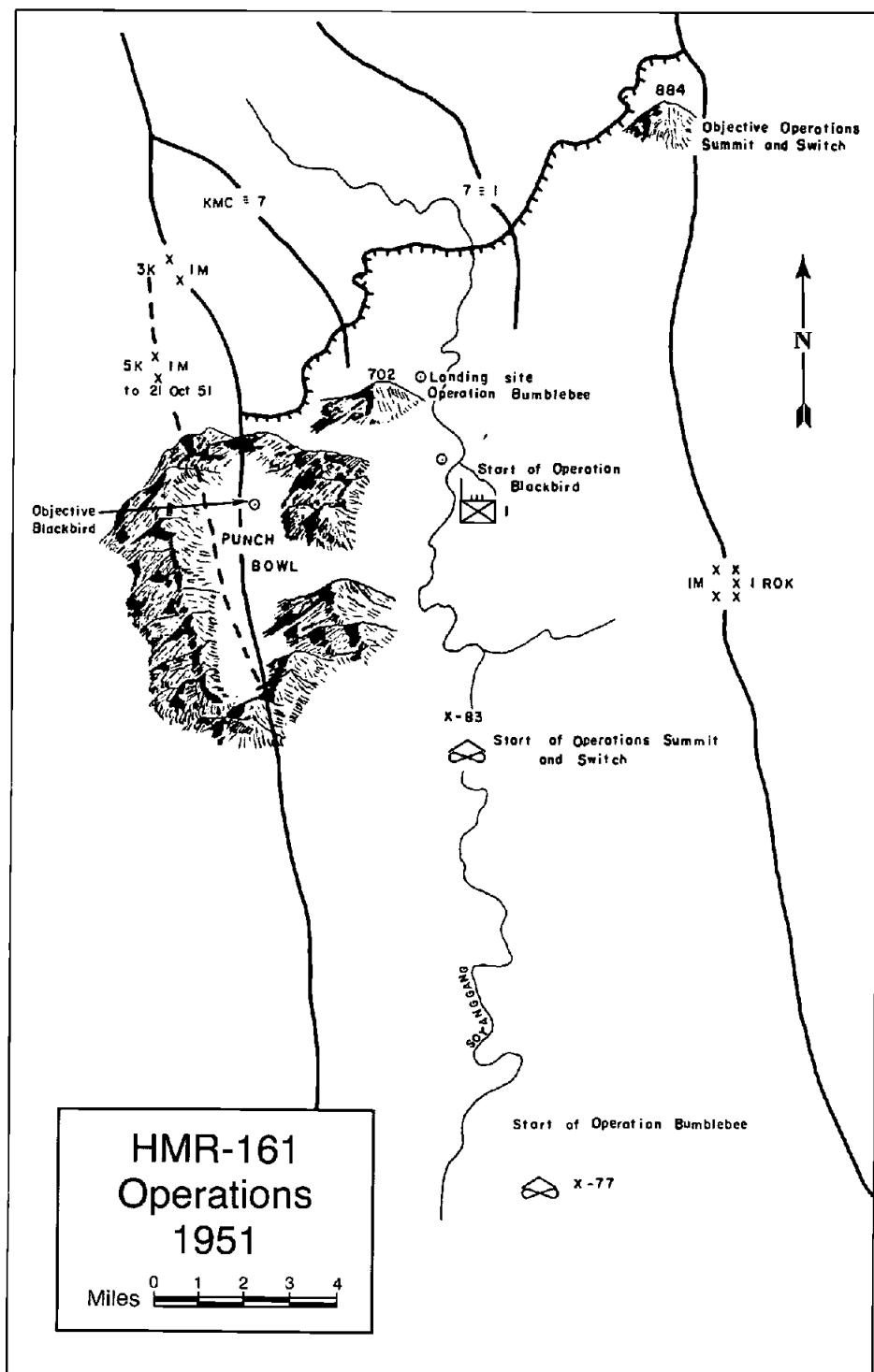
battalion commander. Bumblebee was planned as if it were an amphibious operation. Assignment and loading tables were carefully constructed, detailed arrival and departure schedules were prepared, and helicopter loading and unloading serials were established with each person assigned a specific spot in the heli-

copter, and order of embarkation and debarkation charts were distributed. Lieutenant Brokaw recalled that this time eight troops, carrying only small arms and limited ammunition loads, were squeezed in and only one pilot flew each helicopter to test if such "surge loading" was practical in an emergency. Familiarization classes

and rehearsals were held on 10 October.

Operation Bumblebee kicked off at 1000 on 11 October. Twelve HRS-1 helicopters, working at about 30 second intervals and flying nap of the earth 15-mile routes, carried 958 passengers and more than 11 tons of supplies from airfield X-77 to Hill 702 using 156 individual flights in a total elapsed time of a little more than six hours. Two debarkation zones, Red and White, were used. In each, passenger manifests were used to control loading. The men moved from an assembly area to the "standby" box to the "ready" box and then into the helicopter. If any serial was short, additional passengers were summoned from a nearby "casual" area. At the offload spots shore party personnel "vigorously assisted the passengers by grasping their arms and starting them away from the aircraft." The first man out was the team leader and the last man out checked to see if any gear was adrift. Guides furnished by the ground units hurried the debarking men on their way to keep the landing zones clear for the oncoming waves. Bumblebee made the stateside headlines, but more importantly for the Marine Corps it was a giant step toward turning vertical envelopment theory into reality.

Four days later, the helicopters of HMR-161 again demonstrated their flexibility by mounting Operation Wedge, a short notice lift of 10 tons of ammunition and the evacuation of two dozen seriously wounded South Korean soldiers. Upon learning that a Republic of Korea unit was surrounded and in need of ammunition and medical assistance, Major Mitchell led six HRS-1 helicopters to the rescue. Captains Albert A. Black and James T. Cotton each made four flights into the embattled landing







HMR-161 Historical Diary Photo Supplement, Nov-Dec51

*Troops load on board an HRS-1 at Airfield X-77 during Operation Bumblebee in October 1951. The Bumblebee troop lift was actually made to test contingency plans in case Chinese Communist forces cracked the Minnesota Line.*

zone. At the end of this ad hoc operation IX Corps commander, Major General Claude F. Ferenbaugh, USA, personally thanked each pilot for his effort in support of an allied nation.

While the main focus of effort was defense of the main line of resistance, several incidents behind the lines led to the use of HMR-161 helicopters for antiguerrilla activities. The first of these, Operation Bushbeater, used helicopter-borne teams to sweep the Soyang River Valley in late October. Unfortunately, the uneven terrain and lack of emergency power combined to make this operation the most costly in Korea in terms of aircraft lost. Three HRS-1s went down on 22 October while trying to insert ground units

using knotted ropes for debarkation due to rough terrain. The pilots had difficulty maintaining station at the specified landing site. It was virtually impossible to hover above the ridge because inconsistent wind conditions sometimes caused the sudden loss of ground effect. When an aircraft is near the surface a thick layer of air builds up between the rotor and the surface. This cushion is known as "ground effect," and it creates additional lift. The loss of ground effect requires quick action by the pilot, who must either add power or go into motion before the helicopter plummets. Most pilots were able to avert a crash by gaining forward speed, making an abrupt turn, or diving into the valley. Unfortunately, three helicopters were

unable to take such actions and crashed; two were lost and the third badly damaged its tail rotor; fortunately, only one man was injured. The follow-on salvage operation became another pioneering effort. Supervised by Major Edwin E. Shifflett, and led by Technical Sergeant Thomas M. McAuliffe, Marine working parties were able to dismantle the injured aircraft so all usable parts and one airframe could be recovered. Major Mitchell used his HRS as a "flying crane" to lift out an entire fuselage secured by ropes and harnessed to his cargo hook. Despite the initial setback, the operation continued when more suitable sites were used. Forty insertions were made and more than 200 men landed. Post-crash investiga-

tors determined that similar operations should continue but only after a careful study of the proposed terrain and evaluation of existing atmospheric conditions.

Several other heliborne anti-guerrilla operations followed. Operation Rabbit Hunt used helicopters for systematic patrols of the vast wilderness area behind the main line of resistance. This operation was not unlike those mounted by the 1st Marine Division to control the An Hoa Basin southwest of Da Nang in the Republic of Vietnam 15 years later. Operation Houseburner was mounted on 26 October to deprive enemy irregulars hiding behind

friendly lines of much-needed shelter as winter approached. Two helicopters each carried four-man destruction teams armed with demolitions, flamethrowers, and incendiary grenades. Initially, one ship provided cover while the other hovered and sprayed the target area with a flammable mixture prior to dropping incendiary grenades. Later, both helicopters landed and let the destruction teams do their work from the ground. Operation Houseburner II used four helicopters to destroy 113 dwellings on the last day of the month. This action also featured the first extended firefight between helicopters and ground

troops when an airborne automatic rifle team engaged an enemy position. Although the helicopter itself was not armed, this incident was probably the forerunner of the helicopter gunship.

Operation Switch, the relief and replacement of a full regiment at the frontlines, was the largest helicopter effort so far. On 11 November, nearly 2,000 combat loaded troops swapped positions between Hill 884 (unofficially dubbed "Mount Helicopter" because so many helicopter lifts took place there) and airfield X-83 in about 10 hours. Standard operating procedures included a three-plane flight that dropped off the advanced helicopter support team to supervise operations at the landing zone, departure teams controlled operations at X-83, and naval gunfire kept enemy heads down during flight operations.

Operation Farewell on 19 December saw the rotation of one battalion for another and marked the last flight by HMR-161 commanding officer Lieutenant Colonel George Herring. After that flight, he departed Korea to assume duties as commanding officer of HMX-1 at Quantico. His replacement was that unit's previous commander, Colonel Keith B. McCutcheon. The holder of an advanced degree in aeronautical engineering, McCutcheon had been a proponent and pioneer of Marine close air support during World War II before learning to fly helicopters. Major Mitchell remained as squadron executive officer.

After only two months in the combat, HMR-161 had logged more than 1,200 flight hours comprising more than 1,000 sorties to deliver 150 tons of supplies and carry out 192 medical evacuations. The "flying windmills" of HMR-161 participated in morale building as

*A helicopter-borne Marine destroys a potential enemy guerrilla hideout during Operation Rabbit Hunt. In addition to troops on the ground, Marine demolition crews on board helicopters sprayed gasoline on huts serving as enemy cover and then set them ablaze with phosphorus grenades.*

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*Col Keith B. McCutcheon, left, shakes the hand LtCol George W. Herring, the departing commanding officer of HMR-161. The squadron's last troop lift under Herring was dubbed "Operation Farewell" in his honor.*

well as tactical operations: they delivered large cakes so the front-line Marines could celebrate the Marine Corps birthday on 10 November; on Thanksgiving they brought turkey dinners to the front; a heavy snow storm interrupted plans for Christmas feasts, but the arrival of several United Service Organization entertainers around the new year helped raise morale. The New Year also saw implementation of an additional duty that would last until the end of the war. After ice destroyed a bridge spanning the Imjin River, one HRS-1 and its crew were dispatched on a weeklong rotation to the United Nations Command advanced headquarters at Munsan-ni to ferry United Nations peace delegates to and from Panmunjom.

Colonel McCutcheon's first full

month as squadron commander was the most ambitious helicopter-borne effort thus far; HMR-161 flew the most missions (820) in a single month so far and logged the most combat missions (506) in a single month during the entire war. Three major efforts were launched in January 1952—Muletrain, Changie-Changie, and Mouse Trap. Each exercised a different capability. Muletrain and Changie-Changie were assault support (helicopter-borne resupply and troop transport), while Mouse Trap was an exploration of tactical vertical envelopment. Operation Muletrain (named for a popular song of the day) called for the complete supply of a battalion located on the main line of resistance for one week. The destination was once again Hill 884.

McCutcheon's squadron used a "flying crane" technique developed by Major Charles E. Cornwell whereby the HRS-1s mounted underslung nets carrying about 850 pounds and controlled from the cockpit to deliver cargo rather than pallets as had been previously done. Tentage, stoves, rations, fuel oil, and ammunition comprised the various loads. Four helicopters, operating on a rotating basis, were so effective that they actually flew in more cargo than could be handled by the shore party during the first week of January; 219 loads equaling 150,730 pounds were ferried about 10 miles from the supply dump to Mount Helicopter.

Operation Changie-Changie (pidgin Korean-English meaning "exchange") was a troop lift that



National Archives Photo (USMC) 127-N-A159212

*Marines in Korea for the first time are moved into frontline positions the "modern way." Instead of climbing the steep trails, and spending hours to reach the ridges' crest, helicopters airlift troops in a matter of minutes.*

began on 10 January. The essential difference between this troop movement and previous ones was that this time the helicopters flew into company-sized positions located within a few hundred yards of the frontline. In addition, the 35-man 1st Air Delivery Platoon took over helicopter ground support operations, relieving the hard-pressed 1st Shore Party Battalion of that duty. This realignment of missions was more in line with each unit's stated missions; First Lieutenant William A. Reavis' 1st Air Delivery Platoon was thereafter tasked "to prepare and deliver supplies by air, whether by parachute, air freight, or helicopter." Operation Mouse Trap, conducted from 14 to 17 January, tested the ability of Marines to launch a counter-guerrilla reaction operation on short notice. The squadron was not notified until just after midnight to be prepared to mount a two-company lift by mid-morning on the 14th. The operation went off with only minor difficulties

and was so smooth that three similar lifts were made by the 17th.

For the most part, HMR-161 ceded deep search and rescue operations to VMO-6. The most

notable such mission occurred in early February when the Eighth Army-Fifth Air Force Joint Operations Center requested help to bring back a fighter pilot and helicopter crew downed in enemy territory. Two previous attempts had been turned away by the time Major Mitchell's HRS-1 departed X-83 for airfield K-50 where it would pick up fighter escorts. Diverted enroute, the helicopter landed on the cruiser *Rochester* (CA 124) for a pre-flight brief before setting out. Fighter planes strafed the valley and surrounding ridgelines as the helicopter neared the crash site, but no activity was spotted so Mitchell reluctantly aborted the mission. The techniques used on this mission became standard operating procedure even though the rescue attempt had come up empty.

February 1952 was a harbinger of trouble on the horizon. Another relief in place, Operation Rotate, was successfully conducted on 24th. That same day, however,

*Hot chow is served at the HMR-161 forward operating base near the Punchbowl; after finishing their meal, Marines go through the wash line. Living and working conditions were primitive, but the hard-working ground crews carried on.*

Department of Defense Photo (USMC) A133622







HMR-161 Historical Diary Photo Supplement, Jan52

*The Marine metal shop was located at K-18 airdrome near Kangnung in central Korea. This major maintenance facility served HMR-161 which was flying from the forward strip X-83 at Chodo-ri, behind the Minnesota Line.*

Captain John R. Irwin was enroute from Seoul to X-83 when he encountered severe vibrations. After putting down to locate the trouble, he was amazed to discover the broken remnants of his tail assembly lying in the snow. Four days later, Captain Calvin G. Alston's HRS-1 began to buck and jerk without warning. Suspecting he had been hit by enemy fire, Alston set down to inspect the damage. Like Irwin, he quickly found that a broken tail assembly was the culprit. Similar accidents outside the combat zone prompting the Chief of Naval Operations to ground all HRS-type aircraft until the problem could be isolated, analyzed, and corrected. The squadron was not able to resume normal operations until after new tail assemblies for each aircraft

were installed in mid-March.

After the end of the fighting at the Punchbowl, VMO-6 continued to support the 1st Marine Division flying from Sinchon in the X Corps sector of the East-Central Front. Indicative of the changing roles for light utility helicopters, the squadron listed four HO3S-1s and four HTL-4s in October 1951, but only one HO3S-1 remained on the rolls by March 1952 while the number of HTL-4s had increased to 10. The wisdom of combining helicopters and fixed-wing aircraft within observation squadrons was confirmed by combat experience. A well-defined division of labor between the fixed-wing airplanes and helicopters of VMO-6 had evolved since the early days of the war. The nimble OY were best suited for reconnaissance, artillery spotting, and airborne control of close air support while the helicopter niche combined combat search and rescue and medical evacuation. Transportation and administrative flights were divided

*Sikorsky representative, Louis Plotkin, left, explains the intricacies of an HRS-1 aircraft engine to HMR-161 pilots. Representatives of the Bridgeport, Connecticut, company accompanied the squadron to Korea not only to assist with technical problems, but also to report on how the aircraft performed in combat.*

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HMR-161 Historical Diary Photo Supplement, Jul52

*In March 1952, the 1st Marine Division moved from the Minnesota Line located in central Korea to the Jamestown Line in western Korea. HMR-161 likewise relocated its forward*

*base to A-17 (Yongpu-ni), while the rear echelon's maintenance facility was moved to A-33 not far from the massive supply base at Ascom City outside the capital of Seoul.*

about equally between fixed-wing and rotary-wing aircraft. Unfortunately, hopes for all-helicopter observation squadrons still were considered impractical. As time passed, HTL-4s gradually replaced the aging HO3s-1s, and by February 1952 the one remaining Sikorsky was no longer flying combat missions. The helicopter section's priorities gradually changed to reflect the new tactical situation as well. Positional warfare placed more emphasis on ground support and administrative missions while deep combat search and rescue had become the bailiwick of Navy and Air Force helicopter detachments. In September 1951, medical evacuation and combat search and rescue had been at the top of the list, but by

March 1952 the new priorities were: evacuation of wounded; reconnaissance and observation; liaison and transportation; administrative and resupply flights; and combat search and rescue, in that order. The vulnerability of helicopters was an early concern, but this proved not to be the case as few helicopters were lost and the number coming back with bullet holes became all too common to merit special mention.

Between October 1951 and March 1952, the helicopter section logged 2,253 total flights (1,277 combat and 976 non-combat missions), including 637 medical evacuations to deliver 1,096 seriously wounded men. Most transportation flights involved bringing distinguished visitors to the front.

Among them was Dr. Charles Mayo of the famed Mayo Clinic who visited units of the 1st Medical Battalion. Liaison flights included transportation of the Commandant of the Marine Corps, and Fleet Marine Force, Pacific, and IX Corps commanders. The bulk of the administrative and resupply flights went for medical support; the delivery of fresh whole blood or plasma, medicine, and medical records. After the frontlines stabilized, very few search and rescue missions were called for. Only seven such missions were flown between 1 October 1951 and 15 March 1952.

The helicopter section's only combat casualty during that time occurred when Captain David T. Gooden's HTL-4 was shot down as

it wandered past friendly lines during a medical evacuation mission on 7 February. Neither the pilot nor the helicopter could be recovered due to their location behind enemy lines.

## Defending the Jamestown Line

With both sides roughly equal in manpower and firepower on the ground, the frontlines remained unchanged during the winter of 1951-1952. In March, the United Nations Command decided to realign its forces. The 1st Marine Division moved from its positions along the Minnesota Line on the East-Central Front to the Jamestown Line astride the Pyongyang-Seoul corridor on the western flank. This move initiated the so-called "outpost war" which lasted from March 1952 until July 1953 during which no significant changes of territory occurred. The major

actions of the outpost war included those at "Bunker Hill" in August 1952, a temporary incursion of the main line of resistance at the "Hook" in October 1952, tough fighting for positions "Berlin" and "East Berlin" in early 1953, the "Nevada Cities" (Outposts Reno, Carson, and Vegas) battles in March 1953, and the last fight at "Boulder City" just before the armistice in July 1953.

Although the generally flat terrain of western Korea simplified logistical challenges, the Jamestown Line was no tactical bargain. Terrain and diplomatic conditions prohibited defense in depth and severely hampered the ability of Marine commanders to maneuver or commit reserve forces in case of a Communist breakthrough. The 35-mile Marine sector was the longest defensive zone held by any Eighth Army division. The low-rolling hills on the Marine side

of the line were dominated by the high ground on the far side of no-man's-land held by the Communists. To make matters worse, the Imjin River, with only four crossing points, ran behind the main line of resistance. Major waterways separated the line at two points, and a diplomatic demilitarized "neutral corridor" from Munsan-ni to Panmunjom divided the defensive zone. The United Kingdom's 1st Commonwealth Division anchored the Marine flank on the northeast at the Samichon River, where the 38th Parallel crossed the Jamestown Line. From there the main line of resistance generally traced the Imjin for about 10 miles until it intersected that river; the main line then followed the south bank of the Imjin estuary to where the Han River joined the Imjin, and across the Han an isolated defense sector was located on the Kimpo Peninsula. The main line of resistance was extremely vulnerable and had to be protected by a series of combat outposts scattered throughout no-man's-land. The scrub-covered, low-lying areas that predominated the Marine sector were subject of year-round enemy observation and flooding each spring. Overall, the Jamestown Line was a tactician's nightmare.

In late March, the 1st Marine Division moved 180 overland miles from the Punchbowl to Munsan-ni, an urban rail junction located near the Imjin River about 30 miles from Seoul. Lieutenant Colonel William T. Herring's VMO-6 and Colonel McCutcheon's HMR-161 began displacing from Sinchon in mid-March and had completed their respective moves by the end of the month. Each took up residence at separate landing fields near the 1st Marine Division's command post. The VMO-6 airstrip (A-9) was located in the

*His predecessor, Maj William G. MacLean, right, welcomes LtCol William T. Herring on board as the new commanding officer of VMO-6. A graduate of the Naval Academy, Herring served as the commanding officer of Marine Fighter Squadron 111 and operations officer of the 4th Marine Aircraft Wing during World War II.*

National Archives Photo (USMC) 127-N-A133046





Department of Defense Photo (USMC) A134463

*A badly wounded Marine receives life-sustaining plasma and will be flown to an advance medical care facility in the dark. Night evacuations were hazardous affairs because early helicopters lacked instrumentation and back lighting.*

village of Tonggo-ri about three miles south of the division command post. The airfield was quickly named Bancroft Field to honor the first Marine helicopter pilot killed in action. HMR-161's forward flight echelon was located at Yongpu-ni's A-17, while its rear echelon including advanced maintenance personnel was at airfield A-33 (Taejong-ni, a well-developed airdrome that served the massive Eighth Army supply base known as Ascom City, which should not be confused with airfield K-5 located at Taejon in south-central Korea).

For the most part, VMO-6 continued flying missions as before with medical evacuation as its

number one priority. During this time the squadron's executive officer, Major William G. MacLean, Jr., developed a plan to station evacuation helicopters, crews, and maintenance personnel at the command post of the centrally located, frontline infantry regiment on weeklong rotations. This "forward evacuation echelon" was on-call around-the-clock and could reach any part of the frontline within a few minutes, cutting evacuation time in half thereby keeping severely injured men within what the surgeons called "golden minute"—the period during which immediate treatment could save a man's life. These operations began

in June, and they included the first routinely scheduled night evacuations. The normal forward evacuation echelon complement was five officers, nine enlisted men, and two helicopters. In addition, close liaison with American and other allied nations' medical stations and hospital ships was maintained. Other missions performed by VMO-6's helicopter section were liaison flights and visual reconnaissance. The former usually brought important visitors to the front while the latter flew commanders along the main line of resistance and offered high altitude glimpses into enemy territory.

Major General John T. Selden,



the commander of the 1st Marine Division, required that a strong defensive line be established but was still nervous because it would be difficult to quickly reinforce the Jamestown Line. Accordingly, two existing "fallback" lines, Wyoming and Kansas, were strengthened, and a series of rapid deployment exercises by the division reserve regiment were planned. Primary among them were those conducted by HMR-161 in the spring and summer of 1952.

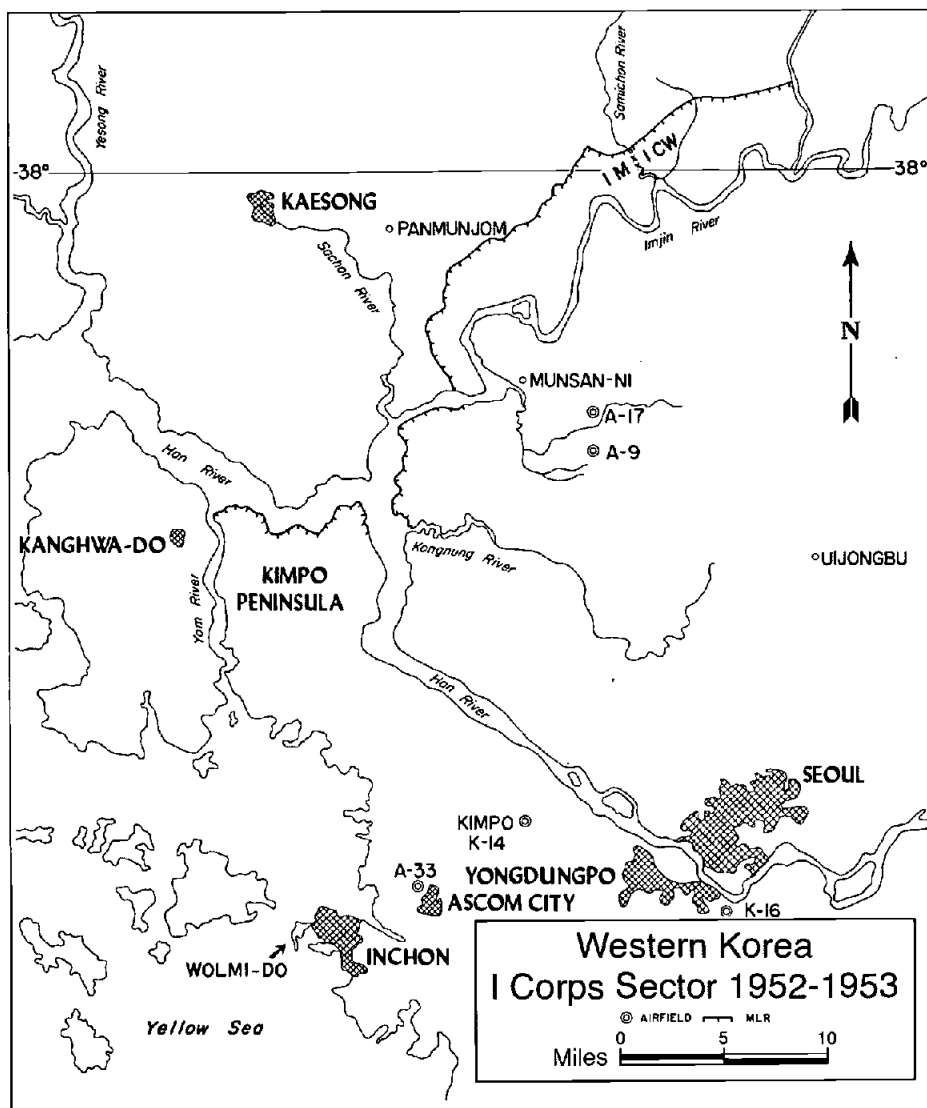
The first test of the ability to move across water obstacles was Operation Pronto. On 5 April, a 662-man battalion and about 10,000 pounds of supplies were transported from Munsan across

the Han River to the Kimpo Peninsula. Ironically, Operation Pronto was both the longest distance and the shortest notice helicopter-borne troop lift so far. Colonel McCutcheon was not notified until about 0210 in the morning, yet, the first helicopter lifted off only about three-and-a-half hours later. The initial wave carried specialists from the 1st Air Delivery Platoon to two landing zones. Thereafter, nine helicopters (seven of them manned by pilots fresh from the United States) were used. The hour-long round trips were almost 60 miles because of flight restrictions in the vicinity of the Panmunjom "neutral corridor." The squadron logged 99 flights in

more than 115 flight hours with a total elapsed time of 14 hours, an all-time high. After the operation, Colonel McCutcheon noted: "This airlift . . . proved that a Marine transport helicopter squadron can successfully operate as an 'on call' tactical tool." The operation was carried out with only minimal liaison between flight and ground units and virtually none of the detailed planning previously employed. Helicopter operations, which only a few months earlier made front-page news in the United States, had by that time, become routine.

An intermittent series of troop lift exercises were interspersed with several tactical and logistical operations over the next year and a half. Pronto was promptly followed by two-day Operation Leapfrog, the helicopter-borne exchange of one South Korean Marine battalion for another on 18 and 19 April. Operation Circus, the lift of a U.S. battalion closed out the month. All operations, except for emergencies, were discontinued on 27 April after the Chief of Naval Operations grounded all HRS-1s due to structural problems. By the middle of May, HMR-161's helicopters were back in action. Two more short notice troop lifts, Operation Butterfly and Ever Ready, were conducted in June and a third, Operation Nebraska, took place in November. The last such exercise was Operation Crossover II held the following spring.

Although combat search and rescue was not a primary mission of HMR-161, one dramatic episode occurred in late May. Two helicopters were dispatched from A-17 to look for a downed Navy pilot near Hapsu, North Korea. During the airborne search, the HRS-1 flown by Major Dwain L. Lengel and Captain Eugene V.







National Archives Photo (USMC) 127-N-A134367

*LtCol John F. Carey, left, bids farewell to his predecessor as commanding officer of HMR-161, Col Keith B. McCutcheon; both men had previously commanded HMX-1 at Quantico. McCutcheon made his reputation as a close*

*air support advocate in the Pacific and eventually commanded all Marines in Vietnam; later he was slated to become the first active duty Marine aviator to receive a fourth star but illness intervened.*

Pointer with crew chief Technical Sergeant Carlyle E.J. Gricks on board lost flight control due a combination of low speed and high altitude. Flying low to the earth, the helicopter was unable to gain enough power to maneuver around a stump. The aircraft crashed and no one was seriously injured, but the would-be rescuers now needed to be rescued. The crew quickly moved to a pick up location but had to wait almost two days due to bad weather. Squadron mates Captain Robert J.

Lesak, First Lieutenant Wallace Wessel, and Technical Sergeant Elmer DuBrey flew the rescue mission. It was a complicated pick-up procedure. In order to keep from repeating the previous crash, Captain Lesak had to keep his aircraft in motion to stay aloft. This required the downed crew to grab a trailing rope ladder as the HRS passed overhead. Fortunately, the rescue was a success, if not a frustrating one.

One of the primary purposes of rushing HMR-161 to Korea was to

test vertical envelopment concepts as they applied to amphibious operations under wartime conditions. This was not possible at first due to geographic restrictions when the Marines manned the East-Central Front. The move to western Korea brought the Marines close to the sea, but initial operational tempo and subsequent grounding of the HRS-1s delayed the opportunity until June. At that time as series of Marine landing exercises (MarLExs) were held at a rate of about two each month for

the remainder of 1952 with two more held the following year. Although there were minor variations in each MarLEx, they generally followed a similar pattern: a detachment of a half dozen HRS-1s from HMR-161 would lift one battalion of the division reserve from one small island to a larger one during a simulated amphibious assault. The purpose of these exercises was twofold. First, tactics and techniques were perfected with each passing exercise as lessons were learned and assimilated. Second, aircraft and ground personnel became familiar with the standard operating procedures for helicopter-borne operations. The

main problems were the lack of an escort carrier and helicopters. Untested Marine amphibious doctrine envisioned individual transport helicopter squadrons and rifle battalions embarked on board escort carriers during the movement to the amphibious objective area. Once there, the helicopters would conduct one portion of the ship-to-shore movement then be on call to deliver supplies and evacuate casualties until the beachhead was secured and operations could safely move ashore. The trouble was that the Navy did not have enough carriers or crews to implement this policy, and no escort carrier was readily available

to support most MarLEx operations. In addition, the demands on HMR-161 prohibited the entire squadron from participating in the exercises.

MarLEx I was held on 10 and 11 June with its announced purpose to gain experience in vertical envelopment as part of an amphibious operation. Because no escort carrier was available, the island of Sung Bong-do about 40 miles southwest of Inchon would stand in for the missing ship. Nearby Tokchok-to, a five-mile-long island with two broad sandy beaches located about six miles southeast, was selected as the objective. As was standard practice, helicopter

*An HRS-1 helicopter of HMR-161 approaches the escort carrier Sicily (CVE 118). The Marine transport squadron experimented with the newly developed concept of vertical*

*assault in the many landing exercises conducted during the Korean War.*

National Archives Photo (USMC) 127-N-A134628





1st Air Delivery Platoon Historical Diary Photo Supplement, Feb53

*Col Harry N. Shea, right, commanding officer of the 11th Marines, briefs from left, 1stLt Donald L. Seller, Commanding Officer, 1st Air Delivery Platoon, 1stLt William B. Fleming, Executive Officer, 1st 4.5-inch Rocket*

*Battery, Capt Edwin T. Carlton, Commanding Officer, 1st 4.5-inch Rocket Battery, and LtCol John F. Carey, Commanding Officer, HMR-161, prior to a fire mission in support of Korean Marines.*

support teams descended from hovering helicopters using rope ladders to prepare landing zones. Seven aircraft delivered 236 fully equipped troops the first day and another 236 the following day. Unfortunately, the exercise did not go well. Communications were unsatisfactory, and the time required to land troops by helicopter was "too great in comparison to the time needed to land troops . . . by boat." It was decided to use a closer island the next time to reduce the strain on the helicopters and the time in the air. MarLEX II was held later that month. This time Soya-do, two

miles from Tokchok-to, was used as the simulated carrier. Four instead of seven aircraft were used to lift 235 men, and the exercise was deemed a success.

The Marines finally got to train with an actual aircraft carrier in September. The escort carrier *Sicily* (CVE 118) was available to support MarLEX VII. This exercise offered the most realistic test of amphibious doctrine as envisioned by planners at Quantico. On 1 and 2 September, the bulk of HMR-161's 12 HRS helicopters were used to lift 964 troops from the carrier deck to Landing Zones Able and Baker on Tokchok-to.

Five more MarLEX operations were held in 1952. They were followed by a six-month break, then two more amphibious exercises were held in the summer of 1953 before the ceasefire took effect.

On 30 July, HMR-161 received a request to launch a humanitarian effort in support of the U.S. Army and South Koreans. More than 600 American soldiers and about 150 Korea civilians had been stranded by flash flooding of the Pukkan River. Six Marine helicopters flew to the rescue. This spur-of-the-moment evacuation was made without written orders or advanced scheduling. The squadron mounted 182

flights over about three hours. The squadron after action report noted: "The average load was five men and gear [but we lifted] as many as nine small children complete with dogs and chickens . . . in one trip . . . . The Army and Air Force . . . marveled at the expeditious way our helicopters carried out the operation."

The month of August saw a change of command when Lieutenant Colonel John F. Carey, yet another veteran of HMX-1, replaced Colonel McCutcheon as commanding officer of HMR-161. September was the busiest month of the war for HMR-161. The squadron flew 1,195 missions. Included in that total were the largest aerial supply operation thus far, the first of many regularly scheduled helicopter-borne troop rotations, the only amphibious exercise supported by an aircraft carrier, and the tactical lift of a rocket artillery battery.

The first of two large logistical support operations took place from 22 to 26 September. Operation Haylift was designed to completely support a frontline regiment for five days. Included in the

loads were rations, water, ammunition, fortification material, and fuel. These supplies were carried internally or suspended below the helicopter frame in wire baskets and cargo nets. The distance from loading zone to landing was about 20 miles, depending upon which loading zone was used. The 1st Service Battalion supplied Loading Zone Able while the 1st Ordnance Battalion did so at Loading Zone Baker; air delivery platoon personnel supervised loading operations and shore party personnel unloaded the incoming aircraft. More than 350,000 pounds of cargo and 75 passengers were lifted despite rainy weather. This effort tripled the output of Operation Muletrain, the previously biggest logistical operation. Operation Haylift was summed up in a single sentence in the squadron report: "No unusual problems were encountered and the operation progressed smoothly and continuously throughout."

The use of helicopters to rotate troops between the rear and the front had become routine by the summer of 1952. So much so that the 1st Marine Division initiated

regularly scheduled replacement operations intended "to effect the relief of a unit on the MLR and return the relieved unit to a rear area as expeditiously as possible," using the codename "Silent Redline." Silent Redlines were conducted at the rate of about one per month during the rest of the year, but were only intermittently used the following year due to tactical considerations (the 1st Marine Division was either off the line or heavily engaged). The first of these began on 11 September with the lift of a Korean Marine battalion. Because these operations were carried out under enemy observation, if they came under direct fire squadron aircraft were directed to seek landing spots in defilade and maintain communications while the ground troops debarked and sought the best defensive terrain. Ten aircraft, each carrying six men or five men and a crew-served weapon, transported 1,618 troops in an overall time of six-and-one-half hours during Silent Redline I.

By the summer of 1952, the strategy in Korea had developed into positional warfare and artillery began to dominate tactical thinking. Unfortunately, the Chinese actually began to outgun the Americans as a result of massive Soviet aid that furnished excellent weapons and plenty of ammunition, and in western Korea the enemy controlled the Taedok Mountain spur which gave them superior observation of the United Nations lines. The Marines countered by adopting mobile artillery tactics using multiple gun positions. One innovative solution came about as the result of a cooperative effort between the pilots of HMR-161 and the artillerymen of the 11th Marines. A particularly valuable weapon was the towed multiple rocket launcher. The problem was that these

*Two rocket battery crewmen prepare the launcher for action as an air deliver platoon signalman assigned by HMR-161 to direct incoming cargo-carrying aircraft to the landing site loads a rocket round into the tube.*

1st Air Delivery Platoon Historical Diary Photo Supplement, Feb53



mobile rocket launchers were vulnerable because their back blast kicked up dust and debris that was visible from the Communist side. The rapid insertion of light artillery into defiladed positions followed by a rapid withdrawal, however, would allow the Marines to land, set up, fire a barrage, and then leave before enemy counterbattery fire could pinpoint the target. Experiments at Quantico, Virginia, and Camp Lejeune, North Carolina, proved the feasibility of lifting a 4.5-inch rocket launcher along with a skeleton crew and a small amount of ammunition in a single load. On 19 August, HMR-161 put this theory into practice during Operation Ripple. Rehearsals in Korea tested new delivery methods using a variety of external hooks and release mechanisms, but there was some trouble during the initial lift of the 1st 4.5-inch Rocket Battery. The problems were solved that night and additional operations the following day went much more smoothly. Colonel Carey was able to recommend that helicopters were suitable for rocket launcher transportation, and Operation Ripple was followed by several more similar tactical operations over the next few months. These were the only operations in which helicopters were directly responsible for putting rounds on the target. As such, they were the distant forerunners of the "fire base" concept that became a tactical mainstay in Vietnam.

Beginning in October, one helicopter and a standby crew were assigned to Marine Aircraft Group 12 on a rotating basis to provide air-sea rescue and administrative transportation. As a result of heavy fighting at the Hook the squadron logged the most medical evacuations that month as well, 365. During the month, the squadron



HMR-161 Historical Diary Photo Supplement, Dec52

*Transport squadron's "HR-69" helicopter is decked out as Santa Claus to deliver toys and food on Christmas Day 1952. Although the visionaries at Quantico, Virginia, before the Marines received helicopters foresaw almost every possible use for rotary-winged aircraft and made up a potential task list, it is doubtful that this humanitarian mission appeared on that list.*

also began receiving Sikorsky HRS-2 helicopters. Although a newer model, the HRS-2 offered no significant increase in performance because it used the same engine as the HRS-1; the main differences were that the HRS-2 was about a foot shorter and a few inches closer to the ground. Operation Nebraska, conducted on the 13th, tested the ability of HMR-161 to move troops from one phase line to another. Ten helicopters lifted one rifle battalion and a heavy mortar platoon (820 men) in only two-and-one-half hours comprising 169 individual flights.

Activities in December included Operations Crossover, the movement of a reserve rifle battalion from the Wyoming Line to the Kansas Line; Silent Redline III, the by-then standard helicopter-borne rotation of a frontline battalion by one from the reserve area; MarLEX

XII-52, the last amphibious exercise of the year; and Operation Santa Claus during which helicopter HR-69 was made up to look like jolly old Saint Nicholas as it delivered toys and food to about 100 orphans adopted by the squadron. Also during the month, Colonel Carey flew out to the newly arrived Danish hospital ship *Jutlandia* to test its helicopter-landing platform and to familiarize the crew with helicopter landing procedures. The cold, damp weather and fog continued to interfere with flight operations, but new hangars eased the maintenance burden to some degree. Although few of the shivering mechanics would have believed it at the time, conditions on the Jamestown Line were far superior to those encountered on the East-Central Front the previous year.

January 1953 witnessed the use of HRS helicopters as "flying squad



cars" as they carried members of the 1st Military Police Battalion searching for Communist infiltrators. On the 23d, fire was exchanged between the airborne Military Police and guerrillas on the ground. Three enemy troops were killed while the helicopter suffered only minor gunfire damage.

February hosted the largest helicopter supply operation in Korea, Operation Haylift II. While Haylift I the previous September had supported one frontline regiment for five days, Haylift II was twice as ambitious. This time, two frontline regiments would receive helicopter-transported Class I (rations), III (fuel), IV (construction materials), and V (ammunition) supplies for five days, from 23 to 27 February. The planning and execution of Haylift II was similar to its forerunner, but on a much larger scale. And, this one would take place in much more difficult weather conditions. One hundred

and thirty tons per day were required to support both regiments, but this total was actually exceeded on the first day. The unloading time per load was less than one minute. On 25 February, HMR-161 brought in more than 200 tons, a record. By the third day, the supply build-up had actually surpassed the ability of the ground logisticians to cope with it. Fortunately, emergency requests for ammunition by other units lessened the backlog. Ground fog on the last two days slowed operations. Still, the final results were impressive, 1,612,406 pounds lifted without the loss of crew or aircraft. February also saw records set for the number of combat hours (765), total flight hours (1,275.5), combat flights (575), and total flights (1,183), and the gross lift of more than two million pounds that month was the largest of the entire war for HMR-161.

Sadly, that month also ended

HMR-161's streak of not losing a man. On the 12th, a three-plane flight departed A-33 for Pusan to rendezvous with a carrier that was to take them to Japan. Along the way the HRS-1 carrying Captain Allen W. Ruggles and Technical Sergeant Joe L. Brand, Jr., became separated and crashed into the sea about 25 miles south of Pusan. The cause was believed to have been mechanical failure, but this was never confirmed because there were no survivors and wreckage was never located.

On 15 March, Colonel Owen A. Chambers took over HMR-161. Ten days later, a second HRS-1 went down with three crewmembers on board. Major Doil R. Stitzel was making a test hop out of Ascom City with mechanics Master Sergeant Gilbert N. Caudle, Jr., and Sergeant Richard L. Parsell when their aircraft suddenly lost power, crashed, and burned. All three men were lost.

Only two major operations were conducted that spring, both were troop lifts from the reserve area to the Jamestown Line, Operation Crossover II and Silent Redline VI. On 27 March, all HRS-2 helicopters with more than 200 flight hours were grounded because of rotor blade problems. This was a precautionary move due to stateside incidents, and no HRS-2s in Korea were lost to this cause.

Beginning on 26 April, HMR-161 participated in Operation Little Switch, the six-day exchange of prisoners of war. The United Nations released 6,670 North Korean and Chinese prisoners while the Communists returned only 684 captives, including 15 Marines and three Navy corpsmen. From the middle of the month, HMR-161 provided transportation from Freedom Village near Munsan-ni to Panmunjom for various international delegates and

*A helicopter from HMR-161 prepares to lift bundled supplies from the 1st Air Delivery Platoon area to frontline troops. The air delivery platoon signalman holds the book while the other Marine holds the net in a hook-up position.*

1st Air Delivery Platoon Historical Diary Photo Supplement, Feb53





American negotiators. During the actual prisoner exchange, helicopters stood by to transport the seriously ill or wounded Marines from Panmunjom to one of three hospital ships, the *Consolation* (AH 15), the *Haven* (AH 12), or

the *Jutlandia*, riding at anchor in Inchon harbor. Four Marines had to be evacuated.

In May the 1st Marine Division came off the line for the first time since the Masan interlude ended in January 1951. While this represent-

ed a relief from the rigors of combat, it was not exactly a time of rest and relaxation. The division staff ordered HMR-161 to get busy on the first Marine landing exercise of the New Year (MarLEx 1-53). On 13 May, after careful plan-



VMO-6 Historical Diary Photo Supplement, Nov52

## Sikorsky HO5S

The HO5S helicopter, developed from Sikorsky's S-52 design begun in 1948, was the purpose-built replacement observation helicopter for the HO3S. The S-52 was first conceived as a compact two place machine, but it eventually incorporated recommendations from the fighting front under the designation S-52-2. The HO5S was more compact than its predecessor and featured several new design features to overcome technical problems identified in the HO3S. Forty-eight HO5S-1s were ordered for the Marine Corps in 1951 and accession began in January 1952.

Although its theoretical performance statistics appear only marginally better than its predecessor, the HO5S was actually a much-improved aircraft that addressed many of the HO3S's shortcomings. The HO5S was the first U.S. helicopter fitted with all-metal blades, could mount two stretchers internally, and was much more stable on the ground due to its low center of gravity and four-wheel landing gear. The most unique practical innovation was a hinged, two-piece, forward-mounted observation bubble. Opening the left seat side of the bubble allowed access to the cabin interior for two stretcher-borne patients. In addition, the HO5S could carry three combat-loaded men over short distances.

By the time of the armistice in 1953, almost all VMO-

6 helicopters were HO5Ss. Unfortunately, plans to replace light airplanes with HO5S helicopters in Marine observation squadrons had to be put on hold due to performance problems and structural defects that came to the fore in Korea. It was decided that the Marine Corps needed a machine that offered better stability and easier in-flight control in addition to a more powerful engine. Thus, instead of becoming the backbone of Marine observation squadrons, the HO5S was actually replaced by the Kaman HOK beginning in 1954; the later aircraft remained in operational service for the next decade until was it in turn replaced by the Bell UH-1 Iroquois ("Huey"), which remains the designated Marine observation and utility helicopter to this day. Marine observation squadrons were equipped with fixed-wing airplanes after light helicopter squadrons were created during the Vietnam-era.

### Aircraft Data

**Manufacturer:** Sikorsky Division of United Aircraft Corporation

**Power Plant:** 245 hp Franklin O-425-1 engine

**Dimensions:** Length, 27' 5"; height, 8'8"; rotor, three 33' metal blades

**Performance:** Cruising speed, 96 mph

**Lift:** Pilot and three passengers or two internal stretchers



Department of Defense Photo (USMC) A169730

*A seriously wounded Marine near the Jamestown Line is loaded on board a Sikorsky HO5S-1 helicopter from VMO-6. By 1953, the HO5S-1, which was designed to remedy short-*

*falls of the HO3S-1, had become the Marines' primary medical evacuation aircraft.*

ning and rehearsals, HMR-161 brought a battalion landing team to Yongdong-ni, a beach area southwest of Seoul. This exercise was followed in June by a special helicopter assault demonstration as part of the rehearsal for MarLex II-53. Similar to the previous amphibious exercise in scope and purpose, MarLex II-53 actually turned out to be the last major amphibious exercise during the Korean War. The squadron returned to the lines on 10 July and thereafter continued routine operations delivering supplies to various outposts and transporting mail and

personnel until the ceasefire was declared on 27 July 1953.

The Korean Conflict had finally ended, but HMR-161 was not yet homeward bound. Immediately after the guns cooled off, HMR-161 would support a massive prisoner of war exchange and then enter a period of "watchful waiting" before returning stateside.

The intervening 16 months between the move to the Jamestown Line in March 1952 and the armistice in July 1953 were busy ones for the helicopter section of Marine Observation Squadron 6. The last of the venerable HO3S-1s

(Bureau of Aeronautics number 124343) departed VMO-6 in April 1952. Bell HTLs carried the load throughout the spring until the arrival of replacement helicopters that summer. The first of the new Sikorsky HO5S-1 helicopters arrived in July. This new machine, the first helicopter equipped with all metal rotor blades, was a three-seat utility aircraft that mounted a three-bladed overhead main rotor and a two-bladed tail rotor. Powered by a 245-horsepower Franklin engine, it could carry a 750-pound load at a cruising speed of 96 miles per hour. The



## The Innovators

The first rotary-winged flight machines were children's toys believed to have been developed in China. Just after the end of World War I a rotary-winged airplane, the autogiro, was developed and gained some popularity during the Jazz Age. True helicopter technology, however, did not really take off until just before World War II. Pre-war helicopter enthusiasts in France, Italy, Spain, and Germany spread their gospel throughout Europe and on to the United States. Of the early American designers, three stand out: Igor I. Sikorsky, Frank N. Piasecki, and Arthur M. Young. Each of these men left an indelible mark on U.S. helicopter development, and their legacy lives on in the aircraft used by current Marine aviators.

### IGOR I. SIKORSKY

America's preeminent helicopter advocate, pioneer, and designer was a Russian émigré who moved to the United States to escape communism. He did not invent, nor was he the first to fly, a helicopter. He did, however, formulate a solution to movement stability for rotary-wing flight that has since evolved into the most popular modern helicopter configuration—a single, large, horizontal, overhead rotor stabilized by a small,

vertical, anti-torque tail rotor with forward movement controlled by varying the main rotor's pitch while using the tail rotor to determine direction. Igor Ivanovich Sikorsky developed a wide variety of helicopters that became versatile aircraft equally suited for both commercial and military use, aircraft able to perform unique tasks on land, at sea, and in the air. After World War II, Sikorsky worked closely with the U.S. Marine Corps to adapt his helicopters to military use, a symbiotic relationship between manufacturer and user that carried on even after his death. Today, Igor Sikorsky is rightfully considered the "Father of American helicopters."

Although long interested in rotary-wing flight, Sikorsky actually first gained fame for his multiple-engine aircraft designs. Born in Kiev, Russia, on 25 May 1889, his interest in, and aptitude for, aeronautical engineering became evident early in his life. He began experimenting with flying machines and the principles of aerodynamics prior to entering the Russian Naval Academy. After three years, Sikorsky left St. Petersburg to study in Paris and then returned to his homeland to attend Kiev Polytechnic Institute. He returned to Paris a second time to learn more about rotary-winged flight.

*Inventor Igor I. Sikorsky, the father of American helicopters visits HMX-1 at Marine Corps Air Station Quantico, Virginia. In the background is an HO3S-1 heli-*

*copter, one of the first two "Whirlybirds" assigned to the U.S. Marine Corps.*

National Archives Photo (USMC) 127-N-A322389



He built his first helicopter, a wooden box mounting two horizontal propellers powered by a 25-horsepower motorcycle engine, upon his return to Kiev in 1909. He could never get this machine to fly and concluded that the technology of the day was not adequate, but he also remained convinced that in time rotary-winged aircraft would surpass fixed-wing airplanes as flying machines. Sikorsky continued his experiments using engine-powered sleighs until he turned to designing multiple-engine airplanes. In 1913, he designed and built the world's first four-engine airplane. Thus, he embarked upon a new career path for the next 40 years.

Driven from Russia by the Bolshevik Revolution, a nearly penniless Igor Sikorsky fled to the United States by way of France. In America he eked out a living teaching mathematics and consulting part time. Among his projects was a proposed, but never adopted, trimotor bomber for the U.S. Army. After much hardship, he was able to live the American dream when he converted a Long Island, New York chicken farm into the Sikorsky Aero Engineering Company in 1923. Six years later, the company joined Boeing, Pratt & Whitney, and Chance Vought in forming the United Aircraft and Transportation Corporation. These humble beginnings comprised the genesis of one of America's most successful aviation enterprises. Sikorsky's first successful U.S. design—an all-metal, twin-engine transport, the S-29A—established his reputation for building aircraft noted for their ability to withstand hard landings on rough surfaces, poor weather conditions, and continuous operations with only rudimentary maintenance. By far his most successful airplane to that time was his eight-passenger, high-wing, twin-engine S-38 amphibian. Although designed for commercial use, 16 variants bearing Bureau of Aeronautics "RS" designations were purchased by the U.S. Navy, some of which saw service with the Marine Corps. Sikorsky next turned to large, long-range, four-engine, transoceanic passenger planes. His successive S-40, -41, and -42 models gained fame as the "American Clippers," large flying boats that plied their trade for Pan-American Airways in the Caribbean and across the Pacific Ocean. Economic troubles forced the shutdown of United Aircraft's Sikorsky Division in 1938, but this setback fortuitously once again whetted his long-standing interest in rotary-winged aircraft.

Heartened by technological progress and spurred into action by recent European developments—notably Germany's spectacular public exhibitions of Heinrich Focke's Fa-61—Sikorsky went back to developing helicopters. By 1939 he had created the VS-300, an ungainly looking contraption consisting of a sprawling bare metal frame mounting a single main rotor for lift and a small-tail rotor for control. Although this "flying bed-spring" was not aesthetically pleasing and performed more like a bucking bronco than a steady workhorse, it became the first practical American helicopter after its

initial free flight on 13 May 1940. Not long thereafter, the U.S. military became interested in helicopter development. In early 1942, Sikorsky won an unofficial competition by producing the VS-316. This two-place, single-main rotor helicopter was given the military designation R-4 (R-1, -2, and -3 were competing designs by other manufacturers). It was soon followed by improved versions labeled R-5 and R-6. By the end of the war more than 400 Sikorsky helicopters had been built. The U.S. Navy procured its first Sikorsky helicopter, an Army R-4 given the designation HNS upon transfer in October 1943. Sikorsky-built helicopters have been a mainstay of naval aviation ever since. Marines currently fly the Sikorsky three-engine CH-53E heavy-lift transport helicopter, one of the largest helicopters in the world.

#### FRANK N. PIASECKI

Frank Piasecki, the son of an immigrant Polish tailor born in 1919, was considered the "wonder boy" of early helicopter development. By his 21st birthday he already held degrees in mechanical engineering from the University of Pennsylvania and aeronautical engineering from New York University. He began working as a mechanic for Kellet Autogyro while a teenager then became a designer with Platt-LePage after college before branching off on his own. Piasecki developed the second successful American helicopter using castoff auto parts and an outboard motor. He endeared himself to Marine helicopter proponents with his theories of how tandem rotors could support very large or heavy loads, an innovation that promised to make ship-to-shore movement of complete units and bulky equipment when other machines of the day could lift only a pilot and one or two others. Piasecki co-founded P.V. Engineering Forum, a consortium of aircraft designers interested in rotary-wing flight and was the driving force behind that firm's most successful project, the PV-3. The PV-3 was a large, elongated, bent fuselage, tandem rotor transport helicopter; the first of a series nicknamed "Flying Bananas." The PV-3 was unique because the Flying Banana was rated for eight passengers as well as a crew of two. After its first flight in 1945, the Navy purchased 22 PV-3s (designated HRP by the Bureau of Aeronautics). The HRP quickly established the practicality of tandem rotors for heavy lift, and orders for improved models quickly poured in. Piasecki's notable early success was the famous H-21 Workhorse, which was used by the Air Force as a rescue craft and by the Army ("Shawnees") to haul troops and cargo. The P.V. Engineering Forum became the Piasecki Helicopter Corporation in 1947, then a division of Vertol Aircraft, which in turn became a division of Boeing Aircraft. Venerable Boeing-Vertol CH-46 Sea Knight assault helicopters, lineal descendants of the first Flying Banana have been the backbone of Marine helicopter aviation for more than four decades and continue to serve with the fleet to this day.



## ARTHUR M. YOUNG

The brilliant, but somewhat eccentric, scion of a wealthy Pennsylvania family, Arthur M. Young invented a rotor stabilizer bar that allowed two-bladed rotors to power light utility helicopters. His invention enabled Bell Helicopter Corporation to produce the two most prolific helicopter models in history, each of which remained in production for more than 30 years.

Young began developing his idea while employed by Lawrence D. Bell's aircraft company, the same firm that produced the first U.S.-built jet (the P-59 Bell Airacomet) and the first supersonic aircraft (the X-1 rocket plane). After 15 years of building models and researching rotary-winged flight, Young perfected his revolutionary new concept. He knew that Sikorsky's tail rotor concept eliminated torque, but he wanted to improve flight stability and reduce weight. His solution was a small counter-weighted stabilizer bar linked directly to the rotor that functioned like a flywheel, a device that kept the rotor blades independent from the movement of the fuselage. In 1941, he assigned his patents to Bell Aircraft with an agreement to oversee the production of a few prototype Model-30 helicopters. The first of these rolled out at Gardenville, New York, in December 1942, and then made its first untethered flight the following June. The second prototype looked like an automobile with its fully enclosed cabin and four wheels. That aircraft was the first helicopter used to trans-

port a doctor on an emergency call, and it also rescued a pair of fishermen stranded on an ice floe in 1945. The third prototype featured an advanced instrument panel, a bare metal tubular tail boom, and a distinctive Plexiglas bubble canopy.

Building on the lessons learned while improving the early models, Young next developed the first full production Bell helicopter labeled the Model-47. This machine, first flown on 8 December 1945, was the first helicopter certified for sale by the Civil Aeronautics Administration. It was quickly adopted as a training aircraft by the military under the Army designation H-13 and the Navy designation HTL. The Navy Department purchased 10 HTL-1s for evaluation in 1947. A dozen HTL-2s followed in 1949, with nine HTL-3s the next year. The HTL-4 was virtually identical to the HTL-3 except for some internal mechanical improvements. Eventually, nine variants of the HTL saw naval service, and the Navy purchased more than 200 of them between 1947 and 1958. The Model-47 was so successful that the last HTLs were not stricken from the Marine Corps flight line until 1962, and H-13s were still in service with the U.S. Army well into the Vietnam War.

Modern-day Marines fly two descendants of the HTL, the Bell UH-1N Huey Twin utility helicopter and the heavily armed AH-1W Super Cobra attack helicopter. Both have rendered yeoman duty thus far and are slated to continue naval service for the foreseeable future.

most unique feature of the aircraft was a removable forward canopy that allowed access for two stretchers inside the cabin. This latter feature protected injured passengers from the elements while enroute to advanced medical care, a significant improvement over both the HO3S and HTL models. The HO5S also possessed superior flight characteristics that made it a good reconnaissance and observation aircraft. Unfortunately, its underpowered engine and some structural defects limited the aircraft's performance. By the end of July, VMO-6 mustered eight HO5S-1s in addition to nine HTL-4s. Plans called for the HO5S to completely replace the HTLs as soon as possible. The number of HTLs steadily declined as time passed until only one HTL-4 remained when the ceasefire was declared a little over a year later.

Throughout the remainder of its

tour, VMO-6 had a reputation for being a "happy ship." In the words of commanding officer Major Wallace J. Slappey, Jr.: "Morale was extremely high. . . . The squadron was loaded with gung-ho personnel. Pilots were actually stealing flights from one another. . . . The engineering department was outstanding, working round the clock. . . . Every man pulled his weight by simply knowing what needed to be done and doing it willingly."

From April 1952 until the armistice in July 1953 the helicopter section of VMO-6 averaged about 600 missions per month, usually flying out between 200 and 300 wounded. More than 1,000 missions were mounted in two different months during the summer of 1952 with the single month record of 721 non-combat missions flown in September. Squadron records for combat missions (375) and medical evacuations (428) were

achieved in October 1952 during intense fighting at the Hook when the Communists made their only successful, albeit temporary, penetration of the Jamestown Line. In May 1953, the helicopter section was reorganized into three echelons: a liaison and medical evacuation flight assigned to the 1st Marine Division command post; the squadron headquarters and most aircraft located at airfield A-9; and a maintenance crew in addition to any "down" aircraft stationed at Ascom City (A-33). In May and June, HO5S-1 helicopters from VMO-6 served as standby plane guards in support of the MarLex I and II amphibious exercises.

Two HTLs and five HO5S-1s suffered major damage due to operational mishaps or crashed due to mechanical failures during the squadron's stay in western Korea, and all HO5S-1s were grounded in July 1953 because of numerous

## Aviator and Aircraft Losses in Korea, 1950-1953

### Crews Killed

1stLt Arthur R. Bancroft  
 TSgt Joe L. Brand, Jr.  
 MSgt Gilbert N. Caudle, Jr.  
 Capt David T. Gooden  
 1stLt Robert A. Longstaff  
 1stLt Charles B. Marino  
 Sgt Richard L. Parsell  
 Capt Allen W. Ruggles  
 Maj Doil R. Stitzel

### Helicopter Losses

Date	Unit	Type	BuAer No	Cause
12 Sep 50	VMO-6	HO3S-1	122514	Operational mishap
25 Sep 50	HU-1 (USN)*	HO3S-1	122720	Enemy fire
29 Sep 50	VMO-6	HO3S-1	Unknown	Operational mishap
9 Nov 50	VMO-6	HO3S-1	Unknown	Operational mishap
3 Dec 50	VMO-6	HO3S-1	Unknown	Enemy fire
27 Jan 51	VMO-6	HTL-4	Unknown	Operational Mishap
12 Mar 51	VMO-6	HO3S-1	122518	Operational mishap
13 Apr 51	VMO-6	HO3S-1	122517	Enemy fire
19 Apr 51	VMO-6	HTL-4	128638	Operational mishap
24 Apr 51	VMO-6	HTL-4	128632	Enemy fire
25 Aug 51	MAG-33	HTL-3	124566	Operational mishap
28 Aug 51	VMO-6	HTL-4	128633	Operational mishap
17 Sep 51	VMO-6	HTL-4	128902	Operational mishap
22 Sep 51	VMO-6	HO3S-1	124342	Operational mishap
28 Sep 51	HMR-161	HRS-1	127802	Operational mishap
22 Oct 51	HMR-161	HRS-1	127789	Operational mishap
22 Oct 51	HMR-161	HRS-1	127792	Operational mishap
12 Jan 52	MAMS-12	HO3S-1	122528	Mechanical failure
21 Jan 52	HMR-161	HRS-1	127797	Operational mishap
23 Jan 52	VMO-6	HTL-4	122521	Operational mishap
7 Feb 52	VMO-6	HTL-4	128892	Enemy fire
1 Mar 52	HMR-161	HRS-1	Unknown	Structural failure
14 Mar 52	VMO-6	HTL-4	128625	Operational mishap
17 Mar 52	VMO-6	HTL-4	128887	Operational mishap
27 May 52	HMR-161	HRS-1	127784	Operational mishap
12 Feb 53	HMR-161	HRS-1	127798	Mechanical failure
25 Mar 53	HMR-161	HRS-1	127822	Mechanical failure
18 Jul 53	VMO-6	HO5S-1	130112	Enemy fire

\* U.S. Navy helicopter "on loan" to VMO-6 with one Navy pilot and one Marine crewman on board.

stateside tail boom failures. The only combat loss occurred on 18 July 1953 when an HO5S-1 piloted by First Lieutenant Charles B. Marino was hit by enemy antiaircraft fire while on an artillery spotting mission. The helicopter lost control and crashed killing both the pilot and the artillery observer. This was the last helicopter-related combat casualty in Korea.

## Ceasefire

At 1000 in the morning on 27 July 1953, the United Nations and Communist delegations sat down inside Panmunjom's "Peace Pagoda" to sign the formal ceasefire agreement that would bring an end to the fighting in Korea. The deed was done in only a few minutes, and the guns fell silent a half-day later, at 2000 that evening. It was, however, an uneasy peace. Neither side fully trusted the other. The fighting had stopped, but few believed the war was really over.

The Marines did not stand down and were not going home to march in any victory parades as they had in 1945. Instead, the 1st Marine Division was ordered to organize post-armistice battle positions and to establish a "no pass" line south of the Demilitarized Zone. The Marines were also charged with assisting in the final prisoner exchange of the war, Operation Big Switch. This would be a high-profile undertaking that would be conducted under the watchful eyes of the international press. Anticipating many of the former prisoners would need medical assistance, helicopters from HMR-161 stood by to carry litter patients or those too weak to travel by ambulance to the U.S. Army 11th Evacuation Hospital at Freedom Village near Munsan-ni. Seriously injured men were taken directly to the hospital ships by

helicopter or were air evacuated to Japan by fixed-wing transport planes.

Even at this late date, Marine helicopters in Korea were called upon to perform another mission never dreamed of by the early planners at Quantico. This time the HRSs of HMR-161 provided the best solution to a tangled diplomatic knot. The Marines were responsible for the safety of non-repatriated enemy prisoners, Chinese and North Koreans, who did not want to return home and would instead be placed in the custody of a neutral country, India. The problem was that Syngman Rhee, the president of the Republic of South Korea, refused permission for Indian troops to enter his country. In the words of General Mark W. Clark, USA, the United Nations field commander: "We had to go to great lengths to live up to our pledge . . . that no Indian troops would set foot on South Korean soil. Therefore, we set up an airlift operation, which carried more than 6,000 Indians from the decks of our carriers off Inchon by helicopter to the Demilitarized Zone. It was a major undertaking which just about wore out our helicopter fleet."

Marine Helicopter Transport Squadron 161 carried on in Korea for almost two more years. Its HRS-2s and -3s transported cargo, personnel, and medical evacuees until orders to prepare to leave Korea arrived in late February 1955. The squadron moved from A-17 to Ascom City and the helicopters flew to Iwakuni, Japan, to prepare for the sea journey. On 12 March, HMR-162 officially assumed responsibility for supporting the 1st Marine Division in Korea. By that time part of the squadron had already departed on board the amphibious cargo ship *Seminole* (AKA 104) and the remaining per-

sonnel, helicopters, and gear were stowed on board the aircraft carrier *Wasp* (CV 18) when it bid goodbye to the Far East and sailed for Marine Corps Air Station Kaneohe, Hawaii, on 26 March 1955.

Following the ceasefire, VMO-6's helicopter section continued to provide liaison, observation, and medical evacuation for the 1st Marine Division. The squadron also supported training exercises. The last HTL-4 departed in August 1953, and all HO5S-1s were back in action by October. The squadron reached a helicopter milestone of note when Major John T. Dunlavy flew VMO-6's 55,000th flight hour in Korea during an HO5S-1 test hop on 14 May 1954. The squadron began standing down on 4 February 1955, and finally departed Korea when four separate increments sailed from Inchon for San Diego in April 1955.

## Contributions

The final accounting showed nine Marine pilots and aircrew men lost their lives during helicopter operations in Korea, four due to enemy fire. Helicopters proved to be generally more resilient and far less vulnerable to enemy fire than most thought possible prior to the test of combat—only six (all from VMO-6) of more than two dozen helicopters destroyed during the war were shot down while an uncounted number suffered some damage at the hands of the enemy but returned to base for repairs. The helicopter section of VMO-6 flew 22,367 missions including 7,067 medical evacuations in 35 months of combat flying. During its time in the combat zone, HMR-161 logged 19,639 flights (4,928 combat and 14,711 non-combat), transported 60,046 people, evacuated 2,748 seriously wounded, and offloaded

7,554,336 pounds of cargo.

Marine Observation Squadron 6 was awarded a individual U.S. Presidential Unit Citation and shared two others as an organic component of senior commands. In addition, the squadron received a Navy Unit Commendation, an Army Distinguished Unit Citation, and three Korean Presidential Unit Citations for its actions in Korea. Marine Helicopter Transport Squadron 161 was recognized for its participation as a component of commands that were awarded one U.S. Presidential Unit Citation, a Navy Unit Commendation, and one Korean Presidential Unit Citation.

Some notable early Marine helicopter pilots met mixed fates after their combat service. First Lieutenant Gustave Lueddeke succumbed to poliomyelitis not long after returning to HMX-1 at Quantico, Virginia. Major Armond Delalio was killed during a test flight when his specially configured HRS caught fire and crashed at Patuxent River Naval Air Station, Maryland. First Lieutenant Lloyd Engelhardt and Captain Gene Morrison each commanded Marine Medium Helicopter Squadron 161 as lieutenant colonels in the 1960s. Morrison, in fact, got to put into practice the helicopter combat tactics and techniques he pioneered in Korea when he led the squadron during its deployment to Vietnam in 1965. Brigadier General Edward C. Dyer and Colonel Keith B. McCutcheon both sat on the influential Hogaboom Board that restructured the Fleet Marine Force in 1956. The board recommended that all Marine divisional equipment be air transportable and entire assault battalion landing teams be helilifted ashore to secure beachheads using vertical assault techniques. Captain Victor Armstrong and Colonel Mc-



HMR-161 Historical Diary Photo Supplement, Nov-Dec51

*HMR-161 conducted its first aerial medical evacuation on 13 September 1951. Although medical evacuation was a secondary mission, the squadron carried more than 2,000 seriously wounded men to various locations for advanced medical care. Its sister helicopters of VMO-6 evacuated more than 7,000 during 35 months of combat flying.*

Cutcheon both rose to the highest aviation post in the Marine Corps. McCutcheon was the director of aviation on the eve of the Vietnam era and then later both he and Armstrong held the post of deputy chief of staff (air) as major generals—McCutcheon from 1966 to 1970 and Armstrong in 1975. Lieutenant General McCutcheon was actually slated to become the first Marine aviator to wear four stars on active duty until he was tragically felled by cancer immediately after commanding Marine forces in Vietnam.

Much like that first Marine HO3S that guided the rescue party to the mired amphibious jeep in the marsh at Quantico in 1948, VMO-6 and HMR-161 led the way for helicopters in the other

Services. The United States Army owes a salute to the Marines for conceptualizing and testing the principles of modern airmobile warfare. The Army had long been interested in rotary-winged aircraft and actually used some primitive helicopters during World War II. The Marine Corps, however, pioneered doctrine, employed full helicopter units in combat, and developed hands-on tactical concepts in Korea. *Phib-31*, written at Quantico, Virginia, before the Marines even had a helicopter squadron, is arguably the forerunner of today's airmobile doctrine. According to Air Force historian Robert F. Futrell: "Army officers were [so] impressed by the utility of Marine helicopters in Korea [that] General Ridgway asked the De-



partment of the Army to provide four Army helicopter transport battalions, each with 280 helicopters." His request was significantly scaled down (to only two companies), but within a decade the Army went on to create an airborne division whose assault elements could be helilifted into combat. The Navy and the Air Force took their cues from VMO-6

whose light utility helicopters performed search and rescue, medical evacuation, liaison, and reconnaissance—missions that closely paralleled the needs of those Services.

Today the legacy of those early helicopter pioneers of HMX-1, VMO-6, and HMR-161 lives on within the Marine Corps as well. Marine skeptics were silenced by

*Col Keith B. McCutcheon became one of the most versatile and best-known Marine aviators during his career. He was an innovator and theoretician as well as a doer, and, like his hero MajGen Roy S. Geiger, he commanded both air and ground units in combat.*

National Archives Photo (USMC) 127-N-A132705



helicopter performance in combat, and helicopters thereafter became a full partner in naval aviation rather than the "stepchildren" they had previously been. It is a tribute to the dedication, bravery, and skill of Marine helicopter air and ground crews in Korea that helicopters are vital components of the modern Marine air-ground team. Current Marine helicopter pilots are mounted in the direct descendants of those simple rotary-winged machines that traversed the Korean skies from 1950 to 1953: Bell UH-1 "Hueys" and AH-1 Sea Cobras were sired by the HTL "eggbeaters," the tandem-rotor Boeing-Vertol CH-46 Sea Knights are advanced developments of Frank Piasecki's HRP "flying banana," and the massive Sikorsky CH-53 Sea Stallions evolved from the much smaller HO3S-1 "pinwheels." Currently, the tilt-rotor Boeing MV-22 Osprey is making true the vision of designer Frank Piasecki about the future of rotary-winged flight voiced a half century earlier: "The most dramatic progress will be increased speed of vertical-lift aircraft. This will come from two directions: helicopter designers will add speed to their machines; conversely, airplane designers will add vertical-lift capabilities to their high-speed aircraft. The result will be a blending of flight into machines fully capable of both helicopter flight as we know it and high-speed flight."

While we cannot be certain exactly what the future holds, we can safely state that vertical assault and rotary-winged assault support will remain mainstays of Marine Corps doctrine well into the 21st century. With this in mind, we should always remember this is due to the achievements of the Korean "whirlybirds" that led the way.



## About the Author

Lieutenant Colonel Ronald J. Brown, USMCR (Ret), is a freelance writer, a high school football coach, and an educational consultant. The author of several official histories (*A Brief History of the 14th Marines*, *With Marines in Operation Provide Comfort*, and *With Marine Forces Afloat in Desert Shield and Desert Storm*), he was also a contributing essayist for the best-selling book, *The Marines*, and was the sole author of *A Few Good Men: The Fighting Fifth Marines*. After almost four years active duty from 1968 to 1971, Brown returned to teaching high school for the next three decades; intermittently, he served as an activated reservist traveling to Korea among other places. He is a combat veteran of both the Vietnam and Persian Gulf conflicts. He spent 20 years as a reservist with Mobilization Training Unit DC 7, the Reserve unit that supports the History and Museums Division. Lieutenant Colonel Brown commanded the training unit before retiring from the Marine Corps Reserve in 1996. He is the author of an earlier pamphlet in this series, *Counteroffensive: U.S. Marines from Pohang to No Name Line*.



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