Chapter One

The Helicopter Goes to War

While it may not be a scholarly comparison, the world’s military services have treated the helicopter the way a family might treat an amiable but very troublesome rich uncle. As devoted as helicopter proponents are, and as enthusiastic as the various military services purport to be about its capabilities, it is a sad fact that the helicopter as a weapon has often been neglected until a dire emergency requires its use. This has never been more true than today.

The mission, technology, budget, and service attitudes relating to the helicopter tend to be at variance until guns begin to fire in distant places. Then logistic issues are resolved—most often in a costly and sometimes counter-productive way—doctrinal differences are overcome, and the existing helicopter technology is flogged far beyond its intended capability to achieve the desired results. If these circumstances are sustained for a considerable period, there are improvements in every area, including logistics and doctrine but most importantly in technology, and the helicopter comes into its own. This occurs because the helicopter is usually underfunded in peacetime budgets but gets massive infusions of money when war comes. Unfortunately, once the emergency is overcome, the old conditions reinstate themselves, for a large number of reasons that are ingrained in the economics, culture, and differing doctrines of the military services.

The first of these reasons is the very nature of warfare, in which the cruelest system of arbitrage determines which weapons will be used where. The relative importance of the military helicopter increases in direct proportion to the difficulty of the terrain and the expertise of the enemy in guerilla-style operations. Helicopters were deemed of great importance in Vietnam, given the terrain and the enemy. They are absolutely indispensable in Iraq and Afghanistan for the same reasons. They will in all probability be indispensable in future “low-intensity conflicts” around the globe.

Helicopters are expensive to build, buy, and use. They are difficult to maintain and vulnerable to damage from enemy operations. Therefore, common-sense eco-
nomics dictate the use of fixed-wing aircraft first, wherever and whenever they can do the desired job.

The tendency to rely on fixed-wing aircraft in most situations stems from several causes. The first of these is the fact that helicopter operations against most enemies are possible only when air superiority is established by fixed-wing aircraft, which means that fixed-wing aircraft are already in the theater and available. The second is the latter’s greater speed, range, and resistance to damage and the fact that they are relatively less expensive to operate. A dismal third factor—less recognized because it is shameful—is that aviators in most services not only prefer fixed-wing aircraft to helicopters, but they discriminate against their rotary-wing colleagues.¹

It is a sad truth that the operators of fixed-wing aircraft are treated better in the vital career terms of prestige, rank, and promotion than are the operators of helicopters. This occurs in spite of the brilliant success that the helicopter has achieved in so many of its varied missions, from CSAR to assault operations far behind enemy lines.

Another reason for the repeated failure to synchronize helicopter development and employment is ingrained in the nature of the military services. As an example, we can briefly compare the attitudes of the United States Army and the United States Marine Corps toward the helicopter.

The United States Army gave birth to American airpower. Initially, a few balloons and a few airplanes were allocated to the Signal Corps, but over time, larger establishments came on the scene, such as the Army Air Service, Army Air Corps, and Army Air Forces. All were dedicated to providing support to Army ground forces. Unfortunately, it is the nature of people operating systems to wish to expand their use. In the case of aviation, it is almost irresistible to wish to go beyond the grunt duties of close air support to the more attractive (and in fact often more productive) mission of air interdiction, that is, the longer-range suppression and destruction of the enemy transport, supply, and personnel. Then there is the siren call of air combat, which always has greater appeal to pilots than dropping bombs at low altitude in a very hostile environment.

Marine Corps aviation followed a similar path and a similar goal, but with the intensity, focus, and adherence to the mission that characterize the Corps.

Doctrinal differences, politically muted as long as the air arm was part of the Army, came into the open when the United States Air Force became a separate service on September 18, 1947. While ostensibly still committed fully to the close air
support of ground troops, Air Force leaders genuinely believed that air interdiction was more effective. In contrast, the Marine aviators remained committed to close air support and became exemplars of its conduct.

As will be seen later, the course of world events affected all three of these services. By 1949, it was clear that there were going to be two superpowers armed with nuclear weapons—the United States and the Soviet Union. In the United States, the Air Force began to receive the preferred budgetary support that the United States Navy had enjoyed prior to World War II. The Air Force was now seen as the first line of defense and the Strategic Air Command (SAC) became the symbol of power, deterring the Soviet Union from fulfilling its stated desire to expand its influence.

These events were powerfully important from all viewpoints but had a particular effect upon the development of rotary-wing aircraft. Within the United States Army, three adverse conditions affected the helicopter. The first was the fact that budget cuts and the acknowledged priority of the Air Force forced the Army to go hat in hand to Congress, well aware that it would not receive adequate funds. The second was that many Army leaders liked the helicopter and welcomed its use but preferred to spend the limited budget on other weapons such as armor and atomic artillery. The third element was the inevitable fight that developed between the Air Force and the Army over roles and missions. The Air Force felt that it provided sufficiently for both interdiction and, when and where necessary, close air support and was determined to keep the Army from once again creating its own aerial striking power. The Army felt that it could better define when close air support was necessary and therefore always wanted to develop its own organic air power. Unfortunately for the Army, it had to defer to circumstances.

The Marines had always been indoctrinated with the value of close air support, dating back to the experience gained fighting insurgent forces in the pre-1941 Dominican Republic, Haiti, and Nicaragua. There the early techniques in dive-bombing were developed, and the concept of ultra-close air support became doctrine. After World War II, the Marines believed that close air support was still their main aviation mission and that helicopters could be adapted brilliantly to the role. The effort became well-defined when Lt. Gen. Roy S. Geiger, then commanding general of all Marine forces in the Pacific, observed the nuclear tests at the Bikini Lagoon in 1946. He wrote a letter stating, “It is quite evident that a small number of atomic weapons could destroy an expeditionary force as now organized, embarked, and landed.” General Geiger urged the commandant to “consider this a very serious and urgent matter” and that the Marine Corps “use its most competent officers in finding a solu-
tion to develop the technique of conducting amphibious operations in the Atomic Age.”

Geiger saw that future operations would have to be conducted from farther at sea, from more widely dispersed forces, and must necessarily be done with far greater speed and with much more ability to create rapid concentration of the forces that landed. The Marines have maintained this viewpoint, strengthening it over time, while the Army has vacillated, despite its own splendid demonstrations of expertise with the helicopter as a weapon system.

It must be emphasized that the very nature of warfare at land and at sea led to the development of specialized types of helicopters along with specialized doctrines for their use. The Navy saw enormous utility of vertical-lift vehicles, now extended to unmanned aerial vehicles (UAVs), from small ship decks and aircraft carriers. This had important implications for the Coast Guard and the Navy for rescue, anti-submarine operations, mine-laying and mine counter-measures, and even for use against a surface combatant such as the modern-day drug runner or pirate. These duties bring about many specialized design requirements, such as folding rotor blades, and add to the complexity of helicopter procurement. The Bell Boeing V-22 Osprey is a perfect example of this almost runaway growth in complexity. The other services that use it must accept these compromises despite their cost in utility and capability for their own missions.

Other nations followed somewhat similar paths in their development of the military helicopter and were affected by the experience gained in aerial warfare in both World Wars I and II. It is helpful then to sketch briefly two concepts of aerial warfare that emerged prior to 1945, both of which foreshadowed and influenced the future use of helicopters.

The first of these is the previously mentioned close air support, which was developed to a surprisingly sophisticated degree in World War I, given the general lack of radio communications. In World War II, close air support was vital in all theaters. It became the signature of the Luftwaffe and the German army in the early part of the war and was recognized by Joseph Stalin as being as vital as “air and bread” to Soviet soldiers. The Royal Air Force, and later, the U.S. Army Air Force (USAAF), for reasons we shall see below, had to learn about close air support the hard way when World War II started in 1939, and, amazingly enough, twice had to relearn the same lessons years later in the war.

The second important concept is the rise, at the very end of WWI, of the idea of “vertical envelopment,” that is, the use of airborne troops deployed behind enemy lines, and its subsequent use in WWII. While vertical envelopment never reached the importance of close
air support during that war, it was an impressive, useful, but sometimes costly discipline.

Perhaps the most important result of these two concepts is that they combined to create within most services a small cadre of leaders who saw the value of the helicopter but who could only occasionally bring their ideas to the forefront. It also created doctrinal divisions among leaders that were often tinged more with emotion than pure reason.

The Promise of Vertical Envelopment

The very first manned balloon flight was made by Jean-François Pilâtre de Rozier and François Laurent d’Arlandes in a Montgolfier balloon on November 21, 1783, in Paris. On the following December 1, Benjamin Franklin, comfortably ensconced in his carriage near the Tuileries, observed Jacques Alexandre Charles and Marie-Noel Robert carry out the first manned flight in a hydrogen balloon. One year later, Franklin, astutely watching the balloon mania sweeping Europe, made this prescient observation: “Where is the prince who can afford so to cover his country with troops for its defense, as that ten thousand men descending from the clouds, might not, in most places, do an infinite deal of mischief before a force could be brought to repel them?”

Continually frustrated by the English Channel, Napoleon Bonaparte is said to have considered using a fleet of 2,500 balloons to invade England and, as Franklin suggested, “do an infinite deal of mischief.” Fortunately for the would-be vertical envelopers, the wife of a pioneer balloonist, Sophie Blanchard, persuaded Napoleon that the winds were too fickle for such an endeavor. But the idea was there and remained through the years, especially to innovators such as Winston Churchill and Brig. Gen. William “Billy” Mitchell.

Churchill embraced a commando-style conception of the use of airborne warriors, envisioning dropping a handful at key places to disrupt communications and obtain information. Mitchell, fresh from his superb handling of airpower during the St. Mihiel offensive, had a larger vision.

At St. Mihiel, the largest air battle of World War I, almost 1,500 Allied aircraft were under his control. He used them effectively against about 500 German aircraft during the battle that raged for four days in mid-September 1918. Mitchell’s success gave him the credibility to propose on October 17 an even more imaginative plan to the commander of the American Expeditionary Forces, Gen. John “Black Jack” Pershing.
Pershing knew that the Germans were near collapse but did not want to offer an armistice that would end the war with the enemy still controlling much of France. Against the views of his French and British colleagues, Pershing wanted to continue the fighting by driving forward to campaign in the German heartland. He felt that this was the only way to avoid another war with Germany twenty years later.

Pershing knew that it would not be easy, particularly when the Germans reached their own territory, where their defense would be bolstered by their strong, long-established fortifications. He was particularly concerned that the retreating Germans might make a stand at the fortress city of Metz, and, although the term was not current at the time, the last thing Pershing wanted was to engage in “urban warfare.”

There is anecdotal evidence to suggest that Pershing was thus more receptive than he might ordinarily have been to Mitchell’s idea. His concept was to use parachute troops to open what he termed “a new flank” but would later be called “vertical envelopment.” Mitchell proposed that veteran troops of the First Division, the “Big Red One,” be swiftly provided with parachutes and large numbers of machine guns and parachuted behind the lines in the Metz sector from Allied bombers. Their task would be to seize the fortress of Metz and hold it until advancing Allied troops arrived.

The British and French, already bled dry, were exhausted and overruled Pershing, accepting the German request for an armistice. The war thus ended before his idea could be carried out, but he maintained his interest in the subject. Some small-scale U.S. Army parachuting experiments were carried out in the late 1920s. Mitchell also advocated the creation of powerful attack aircraft such as the very unsuccessful Boeing GA-X twin-engine, cannon-toting triplane that would have been used to support vertical envelopments.

The fiery, controversial Mitchell also backed R&D at McCook Field in Dayton, Ohio. There, under the guidance of a man whose contributions to aviation have been vastly overlooked, Maj. Edward L. Hoffman, development of the American parachute began. At McCook, Leslie L. Irvin designed a parachute using a ripcord to open the device. While this was satisfactory for individual bailouts, in a mass drop, the differences in timing when deploying the chute resulted in spreading the force over too large an area.

The first unofficial paratroop exercise in the United States was conducted at Kelly Field, Texas in the fall of 1928. Harking back to his 1918 idea, Mitchell had six fully armed parachutists dropped from a Martin bomber in a demonstration. But with Mitchell’s 1925 court-martial for insubordination and subsequent resignation, interest in the tactic declined.
The United States would not begin an official paratroop program until 1940. Italy was the first nation formally to adopt vertical envelopment as a tactic, and a 1927 Italian innovation, the “Salvatore” parachute, set the stage for more meaningful developments. The Salvatore parachute was deployed by the use of a static line attached to the parachute just prior to bailout. This was much safer and concentrated the grouping on the ground. The parachutists’ mobility was aided by a new development from Great Britain—the quick-release harness. By 1930, spurred by Benito Mussolini’s aggressive foreign policy, Italy trained some elite battalions in the art and carried out mass drops in North Africa.

The Soviet airborne forces were born in 1930 with exercises that would excite the interest of military men all over the world. The initial mass jumps were so successful that, by 1931, an airborne brigade had been created in the Leningrad Military District. In true Soviet style, the program was aggressively developed, with some 10,000 men being trained for use in twenty-nine airborne battalions. A positive doctrine of isolating and controlling the battlefield was developed simultaneously. In 1935 the Red Army made a mass jump of 1,200 men at Kiev; the vehicle was the Soviet four-engine bomber, the Tupolev TB-3 (ANT-6). The world was quickly deluged with film and photos of the “sky soldiers” sliding off the corrugated-skin wings of the huge bombers.

The exercise at Kiev was extolled by a future head of the Soviet state, Marshal of the Soviet Union Kliment Voroshilov, who said, “The use of paratroopers is a fine and intricate art, which is being developed by the Red Army not as a sport, but as a means of steeling personal courage, and as an important basis of our military power.”

Voroshilov proved to be wrong in this as he did in so many of his later military actions, for the Soviet Union used paratroops infrequently and sparingly during World War II. There were probably many reasons for this, including a shortage of aircraft, training difficulties, and the like. But it is more probable that there was a basic conflict between the initiative and independence required of a paratrooper and the brutal conforming discipline of the Red Army.

Germany, smarting under the terms of the Treaty of Versailles, was casting about for new ideas to level the playing field. These ranged from maintaining only casually disguised quasi-military units to investigating rocketry as an alternative to the artillery that the Versailles treaty limited. It was natural, then, that the concepts of vertical envelopment initiated by Mitchell and demonstrated by the Soviet Union would have appeal.
A man much admired for his courage, but derisively maligned for his slow speech (and, implicitly, slow thought processes), Kurt Student fought in World War I as a pilot. In 1934, he worked with Walter Wever and others in creating Hermann Goering’s pride, the Luftwaffe. As a major general, he developed Germany’s first parachute unit in 1938. This became the 7th Air Division, a closely guarded secret that became famous in April 1940, when Germany began an offensive that would eventually include Norway, Denmark, Belgium, the Netherlands, and France. Some four thousand paratroopers were dropped in a series of very successful operations. Student personally led the assault and was wounded in the head in the Rotterdam operation. The fit, well-equipped German paratroopers became symbols of Nazi prowess, but their losses were so high in the invasion of Crete in May 1941 that they were never used in large-scale parachute operations again.

As the war continued, the United States and Great Britain developed the concept of vertical envelopment on a greater scale. They used parachute troops, supplemented with men and equipment landed by gliders, in large-scale operations in the Mediterranean and European theaters.

As the Germans had found to their dismay in Crete, conducting large-scale vertical envelopment operations often resulted in high casualties. The United States employed both paratroops and glider forces during the invasion of France, in the abortive Operation MARKET GARDEN attack at Arnhem, and in the March 1945 Operation VARSITY. The latter, intended to secure the Rhine crossings, was the largest airborne operation in history, employing more than sixteen thousand paratroops. While the troops fought well and caused the Germans much harm, there were many casualties. Further, the troops were landed over a wide area and had difficulty concentrating as units.

It will be seen later that, as important as these operations were historically, they led indirectly to the formation of opposing opinions as to the value of the helicopter. Before examining this phenomenon, it is necessary to relate the extent of actual helicopter operations during World War II.

The Helicopter Goes to War

As may be seen in Appendix One, the progressive development of autogiros was key to the successful development of the helicopter. Historians now generally credit the Bréguet-Dorand 314 Gyroplane as the first successful helicopter, flying
on June 26, 1935. It apparently lacked development potential and was soon superseded by the work of Heinrich Focke in Germany and Igor Sikorsky in the United States. While autogiros were tested extensively by many armed forces around the world prior to 1939, they were, with very minor exceptions, still not sufficiently developed to be useful in active combat. The war greatly accelerated helicopter development, and there were dramatic instances of their use that forecast their future utility. (*Autogyro* is the generic term; *Autogiro* is the Cierva trade name. *Autogyro* was rarely used at the time. It was mostly pushed by E. B. Wilford, who had his own gyroplane that he didn’t want to be confused with Cierva and his licensees. It didn’t work. A few publications used *autogyro*, but *autogiro* was a near-universal term at the time.)

In Germany, the resurgent Luftwaffe found time and money to develop a wide series of helicopter types that ranged from the Nagler-Rolz series of portable, one-man helicopters through the imposing Focke-Achgelis Fa 223 to the successful but complex and perhaps overemphasized Flettner Fl 282 series. There were many other types proposed, including the jet-powered Wiener Neustadt Flugzeugwerke WNF 342 designed by Friedrich von Doblhoff. The late years of the war saw a flowering of exotic paper designs that included convertaplanes and vertical takeoff aircraft such as the Focke-Wulf Fw Triebflügel, which has become a favorite of speculative television documentaries on Nazi secret projects.

Considered by some to be truly the first successful helicopter, the Focke-Wulf Fw 61 gained international fame when it was demonstrated in Berlin’s *Deutschlandhalle* by renowned test pilot Hanna Reitsch in February 1938. The Fw 61 was a benchmark design, but Heinrich Focke was already at work on its successor, the Fa 223.

Focke had been forced out of Focke-Wulf, the company he had founded, for both political and business reasons. The German Air Ministry was interested in his helicopter, however, and assisted him in forming a new firm, Focke-Achgelis, with Gerd Achgelis, Focke-Wulf’s former chief test pilot. Together they created the larger Focke-Achgelis Fa 223, which used the same side-by-side rotor layout as the Fw 61.

A much larger aircraft, powered by a 1,000-horsepower BMW engine, the Fa 223 performed well and was considered by Adolf Hitler to have great promise for mountain warfare. While as many as 332 aircraft were ultimately ordered, only 47 were produced. The program had the usual development problems and was hampered by Allied bombing. During its testing, the Fa 223 set eight records for speed,
altitude, endurance, and distance and in September 1945 became the first helicopter to fly the English Channel. The type was also made in limited numbers in Czechoslovakia and France after the war.

The most successful German helicopter of World War II was designed by the prolific inventor, Anton Flettner, who had conceived a 2,200-pound, wire-guided, air-to-surface missile for Siemens-Schuckert during World War I. He was also distinguished by the fact that he was befriended by Heinrich Himmler and survived the perils of Nazi Germany even though his wife was Jewish.

Flettner experimented with helicopters during the 1930s and in 1935 created the Fl 184, which was a hybrid autogiro and helicopter design. Testing the Fl 184 led him to adopt a new rotor system termed the synchropter, consisting of twin contra-rotating intermeshing rotor blades, similar to the type now used by Kaman helicopters. This led in turn to the successful Fl 265 and then to the best German helicopter of the war, the Fl 282. Often credited as the first helicopter to go into mass production, the Fl 282 was actually built in small pre-production quantities, with perhaps fifty-four being built and only eleven reaching flight-worthy status.

Called the Kolibri (Hummingbird), the Fl 282 had a high top speed (for a helicopter) of 93 mph and a range of just more than one hundred miles. During tests as convoy-protection aircraft in the Aegean and Mediterranean seas, their performance—if not their maintenance characteristics—was so effective that an order for 1,000 production aircraft was placed, but Allied bombing prevented delivery of most.

Surprisingly, tests showed that the little helicopters were difficult for fighters to shoot down because of their ability to slow down and make sharp turns. Anton Flettner survived the war and was brought to the United States as part of Operation PAPERCLIP, the roundup of Nazi scientists and engineers.¹³

While the German helicopter efforts had been hampered by a lack of coordination, underfunding, and over-bombing, the United States was able to build swiftly on the focused efforts of Igor Sikorsky to bring his never-relinquished dreams of vertical flight to a successful conclusion. Sikorsky, as shown in Appendix One, had begun his rotary-flight experiments in 1908 but soon relinquished them to concentrate on large heavier-than-air craft. He distinguished himself by building the world’s first four-engine aircraft, the Russky-Vityaz (Russian Knight), which first flew on May 10, 1913. This led in turn to the Il’ya Muromets, the world’s first four-engine bomber.
Sikorsky left Russia after the Bolshevik Revolution, settling in the United States and in 1923 founding the Sikorsky Engineering Company. There he produced large and very efficient seaplanes that were used in a variety of roles, including that of pioneering airline transports. He never lost his interest in helicopters, however, and applied for a patent in 1931 for a helicopter that foreshadowed his VS 300. It featured a single lifting rotor and a much smaller vertical tail rotor intended to offset torque. As with almost every technical achievement in helicopters, the latter development was not without precedent. A Dutchman, Albert G. von Baumhauer, designed a helicopter with a vertical tail rotor, driven by its own independent 80-hp engine. It made unsuccessful attempts at flight for several years in the late 1920s.

In 1938, Sikorsky was backed by the United Aircraft Corporation to begin developing a line of rotary-lift aircraft. The firm he created would become the oldest and arguably the most successful manufacturer of helicopters in the world. Sikorsky later said, “It was most interesting, I would say thrilling, to resume a certain engineering development where it was discontinued thirty years earlier, not only in another country but even in a different hemisphere.”

Despite his statement that he was resuming development where he had left it three decades before, Sikorsky had remained au courant with helicopter development, traveling to Europe to witness flights of both the Focke Fa 61 and the Bréguet-Dorand 314 Gyroplane.

Sikorsky’s new design, the VS 300, was created in the spring of 1939, built during the summer, and ready for tests in the fall.

Although he felt he was clearly on the right track, he had to overcome many problems posed by the VS 300. The design was very similar to his 1931 patent and consisted of a simple steel structure supported by a three-wheel landing gear. The tubular steel frame lent itself to rapid modification, and over the next eighteen months its appearance would be changed many times, sometimes quite drastically.

A four–cylinder, 75-hp Lycoming engine, used by many light planes of the period, was mounted in the center of the structure, powering a twenty-eight-foot-diameter, three-bladed rotor. Sikorsky had opted for a utilitarian truck transmission and a series of belts and pulleys to drive the rotor. The Lycoming also powered the rear two-bladed anti-torque rotor.

Sikorsky had adopted the essential Cierva concept of cyclic control and had a collective control to alter the pitch of the three blades. He was the test pilot, sitting in an open cockpit immediately ahead of the engine. Instead of wearing the traditional leather jacket and white scarf, Sikorsky went to work as a test pilot the way he did as an engineer, in a topcoat and
fedora. The first flight took place on September 14, 1939, and as with so many predecessor helicopter experiments, the aircraft was tethered to the ground.

With dogged determination, Sikorsky pressed on, learning to fly the helicopter even as he constantly tried to both improve control and dampen the vibration that threatened to shake the machine apart. In the next sixty days there were improvements, with the tethered flights lasting as long as two minutes, but the program was set back in December when the VS 300 was tilted over by a gust of wind and its rotor blades were smashed.

After appearing in eighteen different configurations, including one that had three tail rotors, the antithesis of Sikorsky’s desire for simplicity, the VS 300 made its first free flight on May 13, 1940. The development was marred by some embarrassing incidents, including an occasion when Sikorsky was asked by Eugene Wilson, the vice chairman of United Aircraft, why the aircraft could seemingly fly in all directions except straight ahead. It is not certain how he received Sikorsky’s answer that “this was one of the secondary engineering problems on which we are still working.”

Fortunately, the problem was solved, and the performance of the VS 300 improved steadily so that by June 1940 it was flying for as long as fifteen minutes at a stretch. Sikorsky often served as the test pilot, setting an endurance record on April 15, 1941, by staying in the air for more than an hour. Two days later, the VS 300 was equipped with large, inflatable rubber floats and operated from both land and water, becoming the first amphibious helicopter.

The U.S. Army Air Corps was interested, assigning Capt. Franklin Gregory as the project officer. A former autogiro pilot, Gregory was at first discommoded by the vibration and control reactions of the VS 300 but soon became an enthusiastic advocate. (By 1944, as a colonel, Gregory would publish *Anything a Horse Can Do: The Story of the Helicopter*, perhaps the first paper clearly articulating the possibilities of helicopters as attack vehicles firing both machineguns and rockets.) He would lead the way in many helicopter projects.

In December 1940, the Air Corps and United Aircraft each put up $50,000 for the development of the first production aircraft, the Sikorsky XR-4 (in company terms, the S-47). On Pearl Harbor Day, December 7, 1941, the first XR-4 was rolled out. It made its first flight on January 14, 1942, with Charles Morris as pilot.

At this point in the helicopter’s development, the biggest uncertainty was whether or not it would (as theory indicated) autorotate safely to the ground in case of engine failure. (One of the most important features of the autogiro was its ability to autorotate, landing safely via the lift provided by the rotating blades. In the
autogiro, the lift is generated by wind passing upward through the blades. In the helicopter, the lift is generated by the force of air passing down though the blades, and this raised a question about its ability to autorotate.)

Some delicate testing proved that this was possible, which cleared the way for a demonstration on April 20 of its abilities for the armed forces. The prototype XR-4 showed a top speed of 82 mph, an altitude capability of at least five thousand feet, and the ability to maneuver in all directions and hover.

One month later, it arrived at Wright Field, Ohio, for further tests, after having flown 735 miles in stages from Bridgeport, Connecticut in sixteen hours and ten minutes flying time. It was the world’s first very long distance flight for a helicopter. Further tests resulted in an initial contract for three YR-4A and twenty-seven YR-4B helicopters for testing and training. This was quickly followed by an order for 100 R-4B production versions. Variants were already designed for multiple missions, including observation, reconnaissance and, presciently, MEDEVAC, with one litter rack fitted externally. Some were equipped with twin pontoons for ship-board use. Before the war ended, Sikorsky had produced more than 400 helicopters for the U.S. Army Air Forces, Navy, Coast Guard, and Britain’s Royal Navy.

The Beginning of Helicopter Air Rescue Operations

The R-4 made history in 1944 in association with one of the most efficient—and glamorous—fighting commands of World War II, the 1st Air Commando Group. The 1st Air Commandos were commanded by Col. Philip G. Cochran, whose deputy was the six-victory Flying Tiger ace, then Lt. Col., later Maj. Gen. John Alison.

The 1st Air Commandos had the highest possible backing for an American unit in World War II. The president of the United States, Franklin D. Roosevelt, had been impressed by the eccentric (to say the least) British Maj. Gen. Orde Wingate, who had conducted long-range jungle operations in Burma. Roosevelt indicated to the USAAF commander, Lt. Gen. Henry H. “Hap” Arnold, that he would like to see American air support supplied to Wingate’s troops. Arnold created a unit, eventually designated the 1st Air Commando Group, and gave them an unlimited charter to acquire the equipment they deemed necessary. In an unusual move, he appointed Cochran and Alison as “co-commanders,” knowing that they were close personal friends. But as Alison knew that a two-commander system would not work, he happily and voluntarily assumed the role of Cochran’s deputy.16
The two men made full use of their charter, shopping the Air Force inventory as if it were having a fire sale and acquiring an initial 380 aircraft—bombers, fighters, transports, and liaison aircraft. Then, when Alison learned that helicopters were coming off the production line, he asked for four Sikorsky YR-4Bs. This generated a conflict with the R-4 program manager, Frank Gregory, now a lieutenant colonel and fully aware that the pre-production YR-4B was a first-generation helicopter with both reliability and maintenance problems. Alison insisted, however, and the helicopters were flown in Curtiss C-46s all the way to the advance bases in Burma.

The 1st Air Commando Group soon became the vehicle by which Wingate’s troops—known popularly as the “Chindits”—made long-range penetrations of the Japanese lines in Burma. Wingate (who was killed in the crash of a North American B-25 on March 24, 1944) set up permanent fortified camps that were resupplied by air. The Chindit attacks disconcerted the Japanese and have been credited with effectively disrupting their planned 1944 invasion of India.

Sikorsky’s Model VS-316 served the Army as the R-4 and the Navy as the HNS-1. (Courtesy of U.S. Army Museum, Fort Rucker)
On April 21, 1944, a Vultee L-1 Vigilant liaison aircraft, piloted by T.Sgt. Edward “Murphy” Hladovcak, was shot down sixty miles behind enemy lines in Burma while carrying three wounded British soldiers. The four men managed to evade the Japanese soldiers who rushed to the crash site and eventually were spotted by a Stinson L-5 Sentinel. The L-5 brought word of their plight back to 1st Air Commando Headquarters at Lalaghat, Burma, and subsequently sustained them with air drops of food and water.

At that time, only one of the four YR-4Bs sent to Burma was still operational. 2nd Lt. Carter Harman was assigned the task of rescuing the four men. Harman, who was a reporter for the New York Times before the war, had volunteered for the Air Corps. Upon winning his wings in flying class 43-C, he became a flight instructor in primary training before becoming a member of the first class of five helicopter pilots in the United States Army Air Forces.

The YR-4B’s low 65-mph cruise speed and short 130-mile range prevented Harman from beginning the rescue operation until he arrived at the forward operating strip code-named Aberdeen, the 1st Air Commando base, on April 25. The jungle’s heat and humidity degraded the performance of the YR-4B’s Warner radial engine, which already had a dubious reputation for reliability.17

Realizing that there was not enough time remaining for him to fly each of the four men back to base, Harman decided to use a liaison plane to do the shuttling. He designated a sandbar in a nearby river as a rendezvous spot. Harman then flew from the sandbar to where Hladovcak was tending to the three wounded British soldiers.

On the twenty-fifth, he made two trips from the sandbar to the rescue site, bringing out a badly wounded British soldier each time. Just as he landed on the second trip, the overheated Warner engine seized, and Harman had to spend the night on the sandbar, hoping that neither he nor Hladovcak and the remaining British soldier would be discovered.

The next morning, the cranky Warner started and Harman ferried out the third British soldier. He returned to get Hladovcak just as what appeared to be Japanese troops began running out of the tree-line about one thousand feet away. Harman made a hasty takeoff and flew Hladovcak all the way back to Aberdeen. They found out later that the soldiers charging into the clearing were friendly Chinese soldiers.18

Harman thus established one of the noblest traditions in warfare, that of using helicopters in CSAR operations. And it is quite fitting that this tradition for helicopters would be established in concert with the great tradition of special force operations begun by the 1st Air Commando Group.
Unfortunately, these traditions were unable to overcome the budgetary, doctrinal, and philosophical arguments that would preclude an orderly, structured development of the helicopter and that began in 1947 and extend until this day in the U.S. military services. In the next chapter, we will see how these arguments play out against a historical background of developments related to vertical flight.