



Airborne (Tom Clancy's Military Reference)

By Tom Clancy

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They are America's front lines--serving proudly in forward areas around the world. Representing the very best from the Army and Air Force, the Airborne Task Force is an unstoppable combination of manpower and firepower. Now, Tom Clancy examines this elite branch of our nation's armed forces. With pinpoint accuracy and a style more compelling than any fiction, the acclaimed author of **Executive Orders** delivers an fascinating account of the Airborne juggernaut--the people, the technology, and Airborne's mission in an ever-changing world...*Two Tom Clancy "mini-novels"--real world scenarios involving the airborne task force*Airborne's weapons of the 21st century, including the Javelin anti-tank missile, the fiber-optically guided N-LOS fire support system, and the Joint Strike Fighter*18 weeks: Life in an Airborne Alert Brigade*Exclusive photographs, illustrations, and diagramsPLUS: An in-depth interview with the incoming commander of the 18th Airborne Corps, General John Keen

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Editorial Review

About the Author

A little more than thirty years ago **Tom Clancy** was a Maryland insurance broker with a passion for naval history. Years before, he had been an English major at Baltimore's Loyola College and had always dreamed of writing a novel. His first effort, *The Hunt for Red October*, sold briskly as a result of rave reviews, then catapulted onto the *New York Times* bestseller list after President Reagan pronounced it "the perfect yarn." From that day forward, Clancy established himself as an undisputed master at blending exceptional realism and authenticity, intricate plotting, and razor-sharp suspense. He passed away in October 2013.

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For Staff Sergeant William P. Tatum, III (Company E, 313th Military Intelligence Battalion), who gave his life during the JRTC 97-1 Deployment of the 1st Brigade of the 82nd Airborne Division on October 8th, 1996, at Fort Polk, Louisiana. He died as he had lived, doing the job for which he had trained and prepared. Staying ready so that the rest of us might go about our lives. His friends, family, and fellow All Americans love and miss him.

Acknowledgments

Once again, this is the place where I get to introduce you to some of the folks who made this book a reality. We'll start with my long-time partner and researcher, John D. Gresham. Once again, John traveled the country, met the people, took the pictures, spent nights in the field losing sleep and eating MREs, and did all the things that ensure readers feel like they are there for all the action. Also, we have again benefited from the wisdom, experience, and efforts of series editor Professor Martin H. Greenberg, as well as Larry Segriff, and all the staff at Tekno Books. Laura Alpher is again to be praised for her wonderful drawings, which have added so much to this series. Tony Koltz, Mike Markowitz, Eric Werthiem, and Jerome Preisler all need to be recognized for the outstanding editorial support that was so critical and timely. Once again, thanks go to Cindi Woodrum, Diana Patin, and Roselind Greenberg, for their continued support in backing the rest of us in our many efforts.

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for the many other unnamed “All Americans” who took the time to show us the vital things that they do, we say, “Airborne!” We need also to acknowledge the vital support of folks out at the supporting bases who gave us so much information. These included Major General Michael Sherfield and his entire JRTC staff at Fort Polk, and Major Rob Street at Fort Benning. Thanks also to Brigadier General Steven A. Roser, who opened up the 437th Airlift Wing’s aircraft, personnel, and facilities for our inspection.

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Foreword

“Airborne ... all the way!” This is both a greeting and a response that you often hear in and around XVIII Airborne Corps Headquarters at Fort Bragg, North Carolina. There’s a lot more in this simple phrase than meets the eye. It’s an insight into what I like to call the “Contingency Culture,” inherent in being a member of the XVIII Airborne Corps. More on that later, but first let me say some things about our past. The history of the Corps is replete with examples of courage, dedication, and professionalism. The saying above was born in the tradition of its Airborne leaders. In particular, their personal high standards of duty, dedication,

and the Airborne spirit itself. These were men with a vision for what airborne forces could do for America, as well as how they could help free half a world that was then enslaved under the rule of a handful of ruthless dictators and warlords.

These were truly extraordinary men. The great leaders that started the XVIII Airborne Corps back in World War II are names that ring through the history of our Army and history itself. Included were the likes of General Bill Lee (the father of the Airborne forces and first commander of the 101st Airborne Division), General Matthew Ridgway (the first commanding general of the XVIII Airborne Corps), General James “Jumpin’ Jim” Gavin (the legendary wartime leader of the 82nd Airborne Division), and General Anthony McAuliffe (the on-scene commander of the 101st Airborne during the “Battle of the Bulge”—“Nuts!” was his answer to a German demand for his unit’s surrender). They, and many others like them, were there at the very beginning, and started the long, proud tradition that you hear ringing through the greetings from various units of the XVIII Airborne Corps. Cries like: “Air Assault, sir!” (from the 101st Airborne Division [Air Assault]); “All the Way, sir!” (the 82nd Airborne Division’s greeting); “Climb to Glory, sir!” (for the 10th Light Division [Mountain]); and “Rock of the Marne!” (the battle cry of the 3rd Infantry Division [Mechanized]). There is a ton of tradition in these phrases to be sure. The men and women who utter those battle cries today are even more impressive.

The leadership of our military for many years has been rooted in the duty, honor, and devotion of officers produced by the Airborne. Names like Palmer, Westmoreland, Wickham, Lindsay, Stiner, Foss, Shelton, and so many, many others. They set the standards that made airborne forces something our national leaders could trust, and were leaders in whom soldiers could believe. Just how those young troopers felt is shown in a personal memory of mine. Recently, while rummaging through some of my late father-in-law’s (H. R. Patrick) personal possessions, I came across a Bible that he had kept as a member of the 82nd Airborne Division during World War II. Issued to troops prior to entering combat, there was a place in the center of these Bibles where one could keep important information, both personal and professional. In one section, there was a place for unit information. One spot asked for the company clerk’s name. My father-in-law listed (I believe) a Technical Sergeant Hill. It then asked for his commander’s name, which clearly meant his *company* commander. However, PFC Patrick had penned in “Gen. Gavin.” Think about that. This means that a soldier at the bottom of the 82nd’s organization felt a direct connection to his division commander. I am told that the entire division felt that General Gavin was their “personal” commander, such was his leadership style, and such was their trust and confidence in him. These are the types of leaders that this unit and others in the XVIII Airborne Corps have continued to produce. Men and women with the vision to see the future, but the personal integrity and leadership to touch the individual soldier in the field.

These standards of duty and dedication continue today in *all* the units of XVIII Airborne Corps. Certainly the original Airborne spirit lives on. However, that spirit has been transformed into a broader definition which for lack of a better term I refer to as the “Contingency Culture.” This term fits today’s XVIII Airborne Corps in every way imaginable. What this implicitly means is if you are in one of the units of the Corps, and there is a crisis somewhere in the world, then you will be one of the first to deploy in defense of America’s national interests. In addition, you must be ready. Intense and rigorous training is the lot of an XVIII Airborne Corps soldier, whatever his or her specialty. It also means that your rucksack is always packed and you are man or woman enough to carry it whenever called. Since the end of the Vietnam and Cold wars, this response to crisis has included such places as Grenada, Panama, Kuwait, Iraq, Somalia, Haiti, and many others that never made the evening news. Life in the XVIII Airborne Corps is tough and demanding with a lot of time away from home and loved ones. However, the “Contingency” lifestyle also provides much in the way of satisfaction and pride for those who choose to embrace it fully. It is this pride in doing a hard job well that keep standards high and morale rock-solid in our Corps.

The units of XVIII Airborne Corps are wide and varied. This variety insures that the Corps can rapidly

embark on almost any kind of operation required by our national leadership. These units include a heavy armored /mechanized force (the 3rd Infantry Division [Mechanized]), rapidly deployable light infantry (the 10th Mountain Division), instantly deployable forced-entry forces (the 82nd Airborne Division), highly mobile heliborne units (the 101st Airborne Division [Air Assault]), and numerous other equally qualified units. Along with combat force, the XVIII Airborne Corps can also deploy its units with a humanitarian and peace focus. Many of these capabilities come from the forces already mentioned, as well as from our “total force” mix of active, reserve, and National Guard units, which gives us a “rainbow” of skills to bring to any kind of crisis that might break out around the world. For this reason, the units of XVIII Airborne Corps have become the force of choice when our great country calls. There is a saying around the Corps that “... when trouble breaks out somewhere in the world, the phone rings first at Fort Bragg.” I think that says it all.

This book describes those units, along with the traditions, standards, dedication, and a view to the future of the XVIII Airborne Corps. The flexibility and agility of these units clearly define the Corps as the “force of choice” now and in the future. A future, I might add, that is less clear than the exciting times that we have so recently passed through as a nation and a world. Tom Clancy’s book *Airborne* lays this out in detail for the reader. I think you will find it both interesting and informative.

“Airborne ... all the way!”

Gary E. Luck

General, U.S. Army (Retired)

Introduction

The idea of airborne forces probably started with, of all people, Dr.

Benjamin Franklin of Philadelphia. What prince of a kingdom, he wondered, could defend himself (and that kingdom) against a few thousand soldiers who might descend upon his country from balloons? Okay, it probably was a long way from being a practical concept in the late 18th century. But the guy who, according to legend, discovered electricity with a key and a kite, among many other achievements that we know are facts of history—whatever you may believe—he sure enough came up with the germ of a good idea.

In more conventional terms though, the idea was more than sound. Nobody, certainly no enemy of ours, can put troops everywhere. They only have so many assets to use, and have to distribute them in some way or other that will *never* be perfect. Our job, as *their* enemy, is to hurt them most efficiently by striking where they are weak—by putting our assets where they don’t have many, and doing that quickly and decisively. Better yet, grab something important *really* fast. Something that the enemy cannot do *without*, because they probably can’t even cover all of their most important assets and still hold the places they know you *will* attack with your heavy troops. This knowledge is key to why airborne troops are credible in today’s world.

It’s called seizing the initiative. What uniformed officers call “the initiative” is nothing more than knowing that you have a choice of things to do, and your enemy knowing that as well. Better yet, it usually means that you can conduct your operations while your enemy must wait and react to whatever you choose to do. This is the inherent advantage of the offensive. The more time your enemy worries about what you can do rather than what he can do is money in the bank for the good guys. And that’s before you really do anything bad to him. The spirit of attack is the key to military operations today, and always will be. If you’re sitting still and waiting, your forces are probably sitting ducks, waiting to be served up by your enemy.

The 82nd Airborne Division is the Army’s counterpart to the United States Marine Corps, still a subsidiary organization of the United States Navy. The Marines are mainly light infantry troops who attack from the sea with the Navy in direct support. The Airborne strikes from the sky, carried there and supported by the United States Air Force. Both organizations are elite because they have to be. They do dangerous things. When the

Marines hit a beach, whether by amphibious tractor, landing craft, or helicopter, they are coming in light in weapons. But while the Marines have a friendly sea at their back, and the “Big Blue Team” of the U.S. Navy in direct support, the Airborne goes in just about naked. How naked? Well, imagine yourself dangling from a parachute under fire. Rather like a duck in hunting season, except that you’re slowly coming straight down, and at least a duck can maneuver. Your unit lands scattered; not as a cohesive fighting formation. Your first job is to get organized—under fire from an organized foe—so that you can begin to do your job. Your weapons are only what you can carry, and tough, fit trooper that you are, you can’t carry all *that* much. It is a formidable physical challenge.

In September 1944, Allied paratroopers jumped into Eindhoven, Nimegen, and Arnhem (in Nazi-occupied Holland) in a bold attempt to bring an end to the Second World War by carving open a path through the German lines. This was designed to allow the rapid passage of the British XXX Corps into the German rear areas, cracking the enemy front wide open. It was a bold and ambitious plan, and it went so wrong. Remembered as a failure, Operation MARKET-GARDEN was, in my estimation, a gamble worth taking. Laid on much too quickly (just a week from first notice to the actual jumps) and executed without full and proper planning and training, it very nearly succeeded. Had that happened, millions of lives in German concentration camps might have been saved. As it was, one battalion of paratroopers from the British 1st Airborne Division held off what was effectively an SS armored brigade at Arnhem Bridge (the famous *Bridge Too Far*) for the best part of a week in their effort to save the mission. Outnumbered, heavily outgunned, and far from help, they came close to making it all work.

What this tells us is that it’s not just the weapons you carry that matter, but also the skill, training, and determination of the troopers who jump into battle. Elite is as elite does. Elite means that you train harder and do somewhat more dangerous things—which earns you the right to blouse your jump boots and strut a little more than the “track toads” of the armor community. It means that you know the additional dangers of coming into battle like a skeet tossed out of an electric trap at the gun club, and you’re willing to take them, because if you ever have to do it, there will be a good reason for it. The Airborne doesn’t have the weapons to do their job with a sabot round from four clicks (kilometers) away. They have to get in close. Their primary weapons are their M16 combat rifles and grenade launchers. For enemy armor they carry light anti-tank weapons. There are lots of people around the world with old Soviet-designed tanks to worry about, and Airborne forces have to train for that threat every day. As you might imagine, life in the 82nd can be hard!

However, that just makes them more enthusiastic for the life they have chosen for themselves. Visit them at Fort Bragg, and you see the pride, from the general who commands to the lieutenants who lead the troopers, to the sergeants who lead the squads and the new privates who are learning the business. You see a team tighter than most “old world” families. The senior officers, some of whom come in from other assignments in “heavy” units, almost always shed ten or fifteen years off their birth certificates and start acting like youngsters again. *Everybody* jumps in the division. In fact, everybody wants to jump and wants to be seen to jump. It’s the Airborne thing. You’re not one of the family if you don’t at least pretend to like it—and you can’t lead troopers like these if you’re not one of the family. These officers command from the front because that’s where the troopers are, and there is no rear for the Airborne. They walk with a confident strut, their red berets adjusted on their heads just so, because it’s an Airborne “thing.” They are a proud family.

The most recent nickname for the 82nd is “America’s Fire Brigade.” If there’s a big problem that the Marines can’t reach from the sea, or one that is developing just too rapidly for the ships to move in quickly enough, the Airborne will be there first. Their first job is likely to be seizure of an airfield so that heavy equipment can be flown in behind them. Or they might be dropped right onto an objective, to do what has to be done—hostage rescue, a direct attack on a vital enemy asset—with instant speed and lethal force, all of them hoping that they hit the ground alive so that they can organize, move out, and get it done fast, because speed is their best friend. The enemy will unquestionably be surprised by their arrival, and if you can

organize and strike before he can organize to resist, you win. The idea is to end it as quickly as possible. It's been said that no country has ever profited from a long war. That's probably true. It is certainly true that no soldier ever profited from a long battle.

That's why Paratroops train so hard. Hit hard. Hit fast. End it quickly. Clear the way for other troops and forces. Move out and prepare for the next one. Do these things and perhaps the next enemy will think twice. Maybe they will watch the sky and wonder how many of the red-beret troopers might be just a few hours away, and decide it isn't worth the trouble. Just like nuclear weapons and precision-guided munitions, Airborne forces are a deterrence force with power, mass, and ability to make an opponent think about whether his ambitions are really worth the risk and trouble. Think about that as you read on. I think that you will find, as I did, that the Airborne is as credible as they head into the 21st century, as they were in the Normandy Beachhead in 1944.

—Tom Clancy
Perigine Cliff, Maryland
February 1997

Airborne 101

And where is the prince who can so afford to cover his country with troops for its defense, as that ten thousand men descending from the clouds might not in many places do an infinite deal of mischief before a force could be brought together to repel them?

Benjamin Franklin

It is hard to believe that even a man with the wisdom and foresight of Benjamin Franklin could have envisioned the idea of paratroopers and airborne warfare in the 18th century. Back then, just the idea of floating under a kite or balloon would have seemed somewhat daft to most people. Yet something sparked the imagination of this most American of Colonial-era men. As with so many other things, he saw the future of warfare, although it developed beyond even his amazing vision.

Even today, the idea of jumping out of a perfectly good airplane strikes most people, myself included, as just short of insanity. Nevertheless, airborne forces have become and remain one of the most important branches of the world's armed forces. The reason is simple. Airborne forces have the ultimate advantage of shock and surprise. They are able to strike from any direction, at any place and time. Nobody can afford to cover an entire country with troops to guard every vulnerable point. Therefore, the potential of being surprised by airborne forces is inherently something to worry about. For the actual victims of such an assault, that worry turns to actual dread. History teaches the value of surprise and shock in warfare, and the development of airborne forces in the 20th century is perhaps the ultimate expression of those effects. One minute you are enjoying a quiet night at your post, the next you are fighting for your life against a foe who may be behind you, coming from a completely unexpected direction. Numerous German accounts from the defense of Normandy and Holland in 1944 tell the same story. The possibility of soldiers dropping out of a clear sky to attack you can provide a powerful reason to lose sleep and stay alert.

Airborne forces are hardly an American development. Actually, the United States was one of the last major

powers to develop paratroop units. Prior to that, Germany, Italy, Russia, and Great Britain had all organized and committed airborne forces to battle. Nevertheless, the U.S. made up for its late start, and eventually conducted some of the largest and most successful airborne operations of all time. Today, despite their high costs, these same nations (and many others) continue to maintain some sort of airborne force. The reasons are obvious. The ability to reach into another nation's territory and suddenly insert a military presence is just the kind of policy option that decision makers might want in a time of crisis. Think back to the 1976 Entebbe hostage rescue by the Israelis, the 1989 Panama invasion, or the initial Desert Shield deployments to Saudi Arabia in 1990.

Unfortunately, keeping such a capability alive and viable is expensive. Airborne troops need special training, equipment, and a force of transport aircraft to deliver them to their targets. Also, the personnel in airborne units are among the best qualified and motivated in the military, thus depriving other branches and services of skilled leaders and technicians that are badly needed. As early as World War II, senior Army leaders were concerned that the airborne divisions were skimming off the cream of their best infantry. A private in an airborne unit might well be qualified to be a sergeant and squad leader in a regular infantry formation. Still, those same Army leaders recognize a need for a hard-tipped force to smash an opening into enemy territory and lead the way in. That force is the airborne.

Modern airborne forces are part of the small group of elite units used by the United States and other nations in the highly specialized role of "forced entry." This means forces assigned, specially trained, and equipped to lead assaults into an enemy-held area, then hold open the breach until reinforcements arrive to continue the attack. Today, these units usually fall into one of three different categories. They include:

- **Amphibious Forces:** These include sea-based units such as the United States Marine Corps (USMC) Marine Expeditionary Units—Special Operations Capable (MEU [SOC]) and the Royal Marine Commando brigades. Riding aboard specially designed amphibious ships and equipped with landing craft and helicopters, they provide the ability to loiter for a long time and hold an enemy coastline at risk.
- **Air Assault Units:** Air assault units are helicopter-borne forces that enable a commander to reach several hundred miles/kilometers deep into enemy territory. First developed in the 1950s by the U.S. Marine Corps, these units are capable of lifting battalion or even brigade-sized infantry forces deep into enemy rear areas to establish strong points, blocking positions, or even logistical bases. Usually land-based in a nearby host nation, they also can be based aboard aircraft carriers, as was done during Operation Uphold Democracy in Haiti in 1994.
- **Airborne Units:** Airborne (parachute/air-delivered) forces are the final, and most responsive, forced-entry units available to national-level decision makers. They can be rapidly tasked and dispatched to virtually anywhere the anti-air threat level is tolerant to transport aircraft. When combined with strategic airlift and in-flight refueling aircraft, they allow the early deployment of ground forces across almost any distance.

In the United States, we have formed our airborne forces into several different types of units. A small percentage are concentrated into the various Army special forces units, like the famous Ranger battalions. Most of our airborne capabilities are found in a single large formation, the 82nd Airborne Division at Fort Bragg, North Carolina. Built around three airborne brigades (each based around a reinforced parachute regiment), it is a force with almost twenty thousand jump-qualified personnel. Everyone from the two-star divisional commander to the public-affairs file clerk is certified to make parachute jumps into a potential combat zone. Once upon a time, there were several dozen such units in the world's armies. Today, though,

only the 82nd is really set up to make a division-sized jump into hostile territory.¹

This is more than just an idle boast. The 82nd was about to make such a jump into Haiti when they were recalled in the fall of 1994. Three full airborne brigades were ready to drop into a country in just a few hours, and bring a dictator to heel, had that been necessary.

Today, in maintaining the capacity to rapidly deploy overseas, the 82nd actually combines the capabilities of several major services and commands, including the U.S. Transportation Command (TRANSCOM) and their organic Air Mobility Command (AMC). The 82nd also derives a great deal of its training and transportation from the Air Force's Air Mobility Command (AMC). Like so many of the capabilities of today's military, there is almost always more to a unit than you see on CNN. So read on and I'll try and show you the varieties of units and qualities that make up the 82nd's legendary history and deadly combat potential.

Airborne Technology

Mother Nature probably deserves the credit for inventing airborne delivery. Puff on the ripe flower head of a dandelion and a hundred elegant parachutes dance away on the wind, each carrying a freight of seed. Evolution has taught countless species of plants and animals the lessons of lift and drag, embodied in an endless variety of superbly designed aerodynamic structures. From bald eagles to butterflies, nature was the original aerodynamic engineer, with endless generations to perfect what man today does with computers, wind tunnels, and composite structures.

A "chalk" of paratroops drops from the rear of a C-17A Globemaster III heavy transport.

OFFICIAL U.S. AIR FORCE PHOTO VIA McDONNELL DOUGLAS AERONAUTICAL SYSTEMS

It's a long way from a dandelion pod to the modern transport aircraft and parachute systems that make the idea of FEDExing an airborne unit overnight to the other side of the world possible. Still, the same physical principles apply to both problems.

Man has dreamt of flight from the very beginning of recorded time. Still, it wasn't until the coming of the 20th century that the basic technologies allowed these dreams to become reality. The first was the transport aircraft. As opposed to fighters and bombers, whose armament constitute their payloads, the transport aircraft is the flying equivalent of a tractor-trailer truck. It is this aircraft which makes airborne operation possible, because without aerial transport, paratroopers are just extremely well-trained infantry.

The other technological development that made the airborne a viable force was the parachute, which required decades of evolution to reach the point where it could reliably deliver a man or vehicle safely to the ground. In fact, not until the 1950s was it really perfected. It is worth a look at these systems to better understand their significance in the development of airborne warfare.

Transport Aircraft

If you have any knowledge of aviation history, you know that General Billy Mitchell was the first American with a real vision of the military uses of airpower. Even before the opening of World War I, he was pondering just what airplanes might do for the Army. The limited payload, range, and speed of early aircraft probably made it unlikely that, at first, he really thought much about dropping armed troops on an enemy. What we know of his nascent visions shows airpower as a tool of coercion, reconnaissance, and overmatching destruction, not necessarily as a delivery service for ground forces and their equipment. Even his experiences in World War I seem to have limited his thinking until 1918, when he began to plan a primitive airborne operation. By the standards of the time it was a stunning scheme: an airborne assault by

parachute infantry behind the German lines. He proposed dropping a force of soldiers from the U.S. 1st Division onto Metz and several other fortress towns to help breakthroughs by Allied forces in the spring of 1919. While the end of World War I occurred before Mitchell could carry out his plan, the seed of airborne warfare had been planted in the American military. As a historical footnote, the young officer assigned to study and plan Mitchell's assault concept was Louis Brereton, who later was to command the 9th Air Force and the 1st Airborne Army during World War II.

It is a matter of historic record that it only took a few years of development to adapt the airplane from a fairground novelty into a combat weapon. Despite the forward thinking of men like Mitchell, the only major military mission that the airplane did not conduct during the Great War is the one that is of interest to us here: personnel, equipment, and supply transport. In their zeal to become a combat arm, the early air force personnel concentrated their efforts upon procuring better models of pursuit (i.e., fighter), bomber, and reconnaissance aircraft.

Even today, most airpower advocates still prefer to think in terms of bombers and fighters striking offensively at an enemy, not the seemingly mundane supporting roles of transport and reconnaissance. Yet it is these last two roles that most ground unit commanders find the most worthwhile. This has been the essential debate for over seven decades. Does airpower support ground operations, or supersede them? Wherever your opinion, it is important to remember that airpower is more than just a killing force in warfare. Everyone, even those leaders wearing USAF blue, needs to remember that airpower's essential value comes from the exploitation of aviation's full range of possibilities. Even those missions important to mere mortals who walk and fight down in the mud.

After the First World War it took the vision of men who wanted to make peacetime aviation into a profitable business to cause the birth of real transport aircraft. The first of these efforts took the form of high-speed mail planes, which brought the dream of quick coast-to-coast mail service to reality. As soon as that concept was proven, the idea of doing the same thing with people came into being. You have to remember that coast-to-coast rail service took a minimum of four to six days in the 1920s. Given a propeller-driven aircraft of sufficient range, reliability, and safety, one could potentially reduce that to a day or two. With such aircraft, profitable airlines were possible. One of the first of these aircraft was the famous Ford Tri-Motor, which arrived in 1926. Called the "Tin Goose," it made regional travel (say, between New York and Boston) in a day not only possible, but routine. European designs like the German Junkers Model 52 (Ju-52) brought similar benefits to airlines overseas.

A portrait of General Billy Mitchell, the father of American Airpower.

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While an excellent start, these early airliners still failed to meet the real requirements of commercial airlines. Slow speeds, low ceiling limits, short range, and small payloads were just a few of the aircraft limitations that commercial operators felt had to be overcome to make aviation a viable industry. The breakthrough came in the form of two new designs from builders who should be familiar to almost any aviation enthusiast: the Boeing and Douglas Aircraft companies. At the time, these West Coast companies were pale shadows of their current corporate structures. In the 1930s, these two upstart manufacturers changed the world forever with their new ideas for large transport aircraft. The first new design, the Boeing Model 247D, appeared in 1933, and was the model that every modern transport aircraft would follow in the future. Features like all-metal construction, retractable landing gear, and a top speed of over 200 kn/381 kph made the 247D an overnight success for United Airlines, which had ordered the first sixty produced.

With the Boeing production line completely saturated by orders from United, other airlines like American

and TWA turned to Douglas, in Long Beach, California, to build a competitor. From this came the famous “DC” series of commercial transports, which would continue through the jumbo jets of today. The original Douglas design, the DC-1, was a significant improvement over the 247D, with better speed, range, and passenger room. Then, in 1935, Douglas came up with the classic piston-engined transport airlift aircraft of all time: the DC-3. DC-3s would be built in larger numbers than any other transport aircraft in history, quickly becoming the backbone of the growing airline industry. By 1938, over eighty percent of American airline traffic was being carried by DC-3s. Additionally, DC-3s were license-built all over the world, even in the Soviet Union (as the Lisunov LI-2) and Imperial Japan (as the L2D Tabby).

Thus, when World War II came, the DC-3 naturally donned war paint and became the C-47 Dakota.² The Dakota served in the air forces of dozens of nations, with some 9,123 being built in the U.S. In fact, the large Army Air Force/Royal Air Force fleet of C-47s was one of the major factors that made the invasion of Europe possible. By being able to move large numbers of personnel, equipment, and supplies efficiently and safely by air, the Allied forces in 1944 had a level of operational mobility and agility that remains a model even today. All because of a simple, basic transport aircraft with two good engines, a highly stable flying design, and a structure that was practically indestructible. By way of example, the DC-3 hanging in the National Air and Space Museum in Washington, D.C., has more than 56,700 flying hours, and was retired in 1952! Other DC-3/C-47 airframes have served even longer. Some updated versions, equipped with everything from turboprop engines to GPS satellite navigation systems, are still going strong today, more than sixty years after coming off the production line.

What made aircraft like the 247D and DC-3 so revolutionary in their day was the integration of a number of new and emerging technologies. Technologically they had more in common with today’s jumbo jets than they do with the wood-and-canvas contraptions that had come before them. Their technical innovations included flush riveting, monocoque construction, turbo-supercharged radial engines, pressurized cabins, radios, and the first generation of modern aerial navigation instruments. These aircraft represented a technical Rubicon which, once crossed, could make commercial air transportation as viable and profitable a business as any railroad or trucking company.

Now, don’t let me mislead you into thinking that transport aircraft alone won the Second World War and made victory easy. It needs to be said that the thousands of C-47s and other transport aircraft that the Allies produced were just barely adequate for the rudimentary (by current standards) tasks that they were assigned, and had many shortcomings. The C-47 was only capable of carrying about two dozen paratroops out to a range of several hundred miles from their home bases. Older designs, like the Ju-52s (affectionately known as “Iron Annies” by their crews) used by the Germans, were lucky to carry half that many. Also, World War II-era transport aircraft were terribly vulnerable to enemy action. Lacking armor and self-sealing fuel tanks, they were death traps if they encountered antiaircraft fire (AAA) or enemy fighters. Finally, they were poorly configured for the job of dropping any cargo bigger than a large equipment “bundle.” Their side-opening cargo doors made carrying anything larger than a jeep difficult at best, and dropping that same jeep by parachute simply was not possible.

The classic Douglas DC-3/C-47 Dakota, the outstanding transport aircraft of the Second World War.

*OFFICIAL U.S. AIR FORCE
PHOTO FROM THE COLLECTION
OF ROBERT F. DORR*

This shortcoming in heavy equipment delivery led to the development of specially designed gliders, which could be towed behind a transport or bomber aircraft, then released to land gently (it was hoped!).

By the end of the Second World War, the technical problems of building improved transport aircraft to support airdrop operations were clearly understood. The drawdown of U.S. forces following the war restricted new military developments to just a few key programs, and it was some time before these new airlifters could come into service. Commercial development of airliners flourished, creating designs like the Douglas DC-6 and Lockheed Super Constellation (known by their military designations as the C- 54 and C-121 respectively). These, though, were primarily passenger aircraft, and did not have any real improvements in cargo handling or stowage. Until the coming of the new generation of postwar military transports, older aircraft like the C-47 would continue to soldier on, flying the Berlin Airlift and fighting their second major war in Korea.

When the first of the new-generation transport aircraft finally arrived in the late 1940s, they were known as “Flying Boxcars.” The primary builder of these unique aircraft was Fairchild Republic, which designed them to be modular haulers of almost any kind of cargo or load. The Flying Boxcars were composed of a cockpit section with a high wing and two engines in tandem booms, with rudders and elevators running between them. Between the booms the cargo was carried in large pods equipped with powered rear doors and ramps. This meant that the cargo section could have a large rear door to load, unload, and drop cargo, vehicles, artillery pieces, and paratroops. Several variants of the Flying Boxcar were produced, the ultimate version being the Fairchild C-119.

Flying Boxcars were the backbone of the aerial transport fleets of the U.S. and its allies for over a decade. They dropped French paratroops into Dien Bien Phu and Algeria, acted as flying gunships, and even snagged early reconnaissance satellite film containers from midair. Still, the Flying Boxcars suffered from the inherent weaknesses of all piston-engined aircraft: limited speed and lifting power, as well as relatively high fuel consumption. This meant that for airdrop operations, they could only work within a relatively small theater of operations, albeit a larger one than the C-47. The dreams of U.S. Army leaders for projecting combat power directly across the oceans from American soil would have to wait for a major development of some sort. They did not have long to wait.

A formation of three C-119 “Flying Boxcars,” which fulfilled the bulk of America’s medium lift needs in the 1950s.

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Down at Lockheed in Marietta, Georgia, there was a dedicated group of engineers who saw the early potential of jet-powered transport aircraft. Developers of the classic Super Constellation-series airliners, they were now dabbling with an interesting hybrid powerplant: the turboprop. Turboprop engines coupled the new jet turbines with the well-proven technology of high-efficiency propellers. The result was an aircraft powerplant with great power and superb fuel efficiency. When combined with the new generation of airframes coming off the Marietta line, the result was the classic medium transport aircraft of our generation: the C-130 Hercules. While this is a tall claim, it is sufficient to say that over four decades after it first entered production, new C-130 variants are being brought into service.

A Lockheed C-130H Hercules lands during an exercise in Fort Polk, Louisiana. The Hercules has been the standard medium transport for most of the world for a generation.

JOHN D. GRESHAM

Good as the Hercules was, though, it only whetted the appetite of Army and Air Force leaders to expand the capabilities that they wanted from their fleet of transport aircraft. The coming of the Cold War had shown

them that they needed airlifters with high subsonic speed (Mach .7 or better), intercontinental range, and a cargo/payload capacity which would make the movement of whole ground units with all their equipment possible. While the Hercules lacked the high speed and long range that Air Force and Army leaders craved, the C-130 was a giant step forward in combining the desirable characteristics of the new jet/turbine engines with advanced airframe designs. When the Air Force bought the Boeing KC-135 in the 1950s as its first real jet transport (an airborne refueling tanker), it had almost none of the cargo-carrying capacity desired by Army leaders, who were interested in moving forces rapidly and efficiently to a crisis zone.

It took another ten years before a true heavy transport with high subsonic speed and intercontinental range would become a reality. By the mid- 1960s, though, the wishes of everyone in the U.S. armed forces were finally fulfilled in the form of the Lockheed C-141 Starlifter. The Lockheed Marietta engineers took an ambitious requirement for large payload, long range, and high cruising speed, and then combined those features with the ability to be able to slow down to speeds (around 130 kn/241 kph) that would allow paratroops to be safely deployed over a drop zone. The Starlifter did all of this, and still continues to do so today, with seven-league boots and a cargo capacity that can accommodate much of the basic equipment of the U.S. Army's various units.

Good as the C-141 was, the leadership of the Army and Air Force wanted even more. A lot more. Specifically, they wanted to be able to transport every piece of gear in the Army inventory. This requirement involves what is known as "outsized cargo," and includes everything from main battle tanks to the Deep Submergence Rescue Vehicle (DSRV) submarine used to recover the crews of sunken submarines. Also, America's experiences during the Cold War of the 1960s were beginning to show a need for being able to rapidly move large conventional units overseas from U.S. bases. The result became the most controversial cargo aircraft of all time; the Lockheed C-5 Galaxy. When it first rolled out of the hanger in Marietta, the C-5 was the largest production aircraft in the world.⁴ Everything about this new airlifter was big, from the cargo compartment (at 13.5 feet/4.1 meters high, 19 feet/5.76 meters wide, and 144.5 feet/43.9 meters long, more than big enough to play a regulation basketball game while in flight!) to the landing gear system. It was this massive increase in size over the Starlifter that led to so many of the problems that were to hound the Galaxy for the next few years. On an early test flight, one of the wheels on the main landing gear came loose, careening down the Dobbins AFB runway. There also were structural problems and bugs with the avionics.

A Lockheed Martin C-141B Starlifter in the pattern at Charleston AFB, South Carolina. The Starlifter is currently being phased out, and replaced with the new C-17A Globemaster III.

JOHN D. GRESHAM

These troubles, along with the heavy inflation of the late 1960s and early 1970s, caused severe escalations in the price of the C-5 program. So much so that it nearly bankrupted Lockheed, requiring a costly and controversial bailout loan from the federal government (eventually repaid with interest!) to save the company. While the C-5's list of problems may have been long, so too was its list of achievements. It proved vital to the evacuation of Vietnam in 1975, despite the loss of one aircraft. By the end of the 1970s, most military and political leaders were wishing that they had bought more Galaxies, whatever the cost. They got their wish later on, thanks to an additional buy of fifty C-5Bs during the early days of the Reagan Administration.

A Lockheed Martin C-5 Galaxy heavy transport aircraft. The largest production aircraft in the world when introduced, the C-5 fleet will continue to serve well into the 21st century.

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PHOTO FROM THE COLLECTION

In spite of the obvious worth of the C-5 fleet, though, it was costly to operate and maintain. A single Galaxy can require an aircrew of up to thirteen for certain types of missions, which makes it expensive from a personnel standpoint. Even worse, the C-5 uses huge amounts of fuel, whether it is carrying a full cargo load, or just a few personnel. Finally, Lockheed was never really able to keep its promise to make the C-5 able to take off and land on short, unimproved runways like the C-130. If you talk to Lieutenant General John Keane, the current commander of XVIII Airborne Corps (a primary customer for airlift in the U.S. military), he will lament the shortage of C-5-capable runways around the world. Not that anyone wants to retire the existing Galaxy fleet. Just that any new strategic airlifter would have to do better in these areas than the C-5 or C-141. It would have to be cheaper to operate, crew, and maintain, and would have to combine the C-5's cargo capacity and range with the C-130's short-field agility.

This was an ambitious requirement, especially in the tight military budget climate under President Jimmy Carter in the late 1970s. The foreign policy of his Administration was decidedly isolationist, giving the world the impression that America was turning inward and not concerned with the affairs of the rest of the world. This policy came crashing down in 1979, with the storming of the American embassy by "student" militants in Tehran, and the invasion of Afghanistan by the Soviets. Suddenly, there was the feeling in the U.S. that we needed to be able to project power around the world, and to do it quickly. Unfortunately, the drawdown of the U.S. military following Vietnam had left few of the kinds of transportation assets required to do such a job. Clearly the Carter Administration had failed to understand the nature of international relations in the post-Vietnam era, and America's place in it. The United States would have to work hard to again be credible in the growing disorder that was becoming the world of the 1980s.

Even before Ronald W Reagan became President in 1981, work had started to rebuild America's ability to rapidly deploy forces overseas. The Navy and Marine Corps quickly began to build up their fleet of fast sealift and maritime prepositioning forces.⁴ On the Air Force side came a requirement for a new strategic airlifter which would augment the C-5 in carrying outsized cargo, and eventually replace the aging fleet of C-141 Starlifters. The new airlifter, designated C-X (for Cargo-Experimental), drew on experience the Air Force gained from a technology demonstration program in the mid-1970s. During this program, called the Advanced Medium Short-field Transport (or AMST for short), the USAF had funded a pair of unique technology test beds (the Boeing YC-14 and the McDonnell Douglas YC-15) to try out new ideas for airlift aircraft. Some USAF officials had even hoped that one of the two prototypes might become the basis for a C-130 re-placement. However, the sterling qualities of the "Herky Bird" and the awesome lobbying power of then-Senator Sam Nunn of Georgia dispelled that notion. Instead, the technologies demonstrated by the AMST program were incorporated into the request for proposals for the C-X, which was awarded to Douglas in 1981.

Despite the excellent proposal submitted by Douglas and the best of government intentions, the C-X became a star-crossed aircraft. Delayed by funding problems and the decision to procure additional C-5s first, this new bird seemed at times as if it would never fly. In spite of all this, by the mid- 1980s there was a firm design (now known as the C-17 Globemaster III) on the books, and the first prototype was under construction. The new airlifter was designed to take advantage of a number of new technologies to make it more capable than either the C-141 or C-5. These features included a fly-by-wire flight control system, an advanced "glass" cockpit which replaced gauges and strip indicators with large multi-function displays. The Globemaster also made use of more efficient turbofan engines, advanced composite structures, and a cockpit/crew station design that only requires three crew members (two pilots and a crew chief). The key to the C-17's performance, though, was the use of specially "blown" flaps to achieve the short-field takeoff-and-landing performance of the C-130. By directing the engine exhaust across a special set of large flap panels, a great deal of lift is generated, thus lowering the stall speed of the aircraft. In a much smaller

package which can be operated and maintained at a much lower cost than the C-141 or C-5, the Douglas engineers have given the nation an aircraft that can do everything that the earlier aircraft could do, and more.

Along with the building of the C-17 force, the Air Force is updating the inter-theater transport force built around early versions of the C-130, especially the older C-130E and -F models. Naturally, the answer is another version of the Hercules! The new C-130J is more than a minor improvement over the previous models of this classic aircraft, though. By marrying up the same kind of advanced avionics found on the C-17 with improved engines and the proven Hercules airframe, Lockheed has come up with the premier inter-theater transport for the early 21st century. Already, the Royal Air Force (RAF), Royal Australian Air Force (RAAF), Royal New Zealand Air Force (RNZAF), and the U.S. Air Force (USAF) have signed up to buy the new Hercules, with more buyers already in the wings. This means that there will easily be versions coming off the line in 2004, when the C-130 celebrates its fiftieth year of continuous production!

A McDonnell Douglas C-17A Globemaster III in flight. Hugely expensive, this is the most capable airlift aircraft ever built.

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PHOTO VIA McDONNELL

*DOUGLAS AERONAUTICAL
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One other aspect of deploying personnel and equipment by air that we also need to consider is airborne refueling. Ever since a group of Army Air Corps daredevils (including Carl "Tooe" Spatz and several other future Air Force leaders) managed to stay aloft for a number of days by passing a fuel hose from one aircraft to another, aerial refueling has been a factor in air operations. Air-to-air refueling came into its own over Vietnam, where it became a cornerstone of daily operations for aircraft bombing the North. Later on, in the 1970s, in-flight refueling of C-5s and C-141s became common. This was especially true during the October 1973 Arab-Israeli War, when a number of European countries would not allow U.S. cargo aircraft to land and refuel. This meant that tankers based along the way had to refuel the big cargo jets so that they would be able to make their deliveries of cargo into Ben-Gurion Airport nonstop. Today, Air Force cargo flights utilizing air-to-air refueling are commonplace, but then it was cause to rethink the whole problem of worldwide deployment of U.S. forces.

For much of the past thirty years, the bulk of the USAF in-flight refueling duties has been handled by the KC-135. But while highly capable, the -135 has one problem. It can either give away fuel, or deploy to an overseas theater, *but not both at the same time*. Given the need of airborne tanker aircraft to support intercontinental deployments by U.S. forces and still get there themselves, the USAF envisioned a new kind of refueler in the late 1970s. While based on a commercial airliner, the new tanker would be capable of carrying a much larger fuel load than the aging -135s. In addition, a heavy load of palletized cargo and personnel would be carried, to assist USAF units in deploying to bases overseas. Finally, it would be capable of itself being tanked in flight, as well as being able to refuel other aircraft from either the USAF "flying boom" system, or the more common U.S. Navy/NATO "drogue and probe." The result was the McDonnell Douglas KC-10 Extender, of which sixty were bought in the 1980s. Today, the surviving fifty-nine KC-10s are the crown jewels of the Air Mobility Command's tanker fleet. Closely held and lovingly maintained, they may be the key to successfully deploying our forces into remote overseas locations in the future. However you view the tanker force, though, it is important to remember that U.S. forces will go nowhere without a well-prepared and adequately equipped force of airlift/tanker aircraft and qualified crews.

A McDonnell Douglas KC-10A extender aerial tanker aircraft preparing to refuel another KC-10. These aircraft are the key to Intercontinental deployments by the U.S. Armed Forces.

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