

Chapter 1

HISTORY OF SMOKEJUMPING



LESSON PLAN OUTLINE

PROGRAM: SMOKEJUMPER

LESSON: HISTORY OF SMOKEJUMPING

OBJECTIVES: To provide a detailed history of smokejumping.

INTRODUCTION: This unit is intended to provide instructors and trainees a detailed outline of the history of smokejumping. The smokejumper project has been a success since it's beginning in 1939 and has weathered many challenges in an effort to maintain the programs flexibility, efficiency, and effectiveness in support of the wildland fire program.

I. EARLY EXPERIMENTS

In 1917, the U.S. Forest Service started using aircraft in California for fire detection. This was the first use of aviation in Fire Management. The 1920's found attempts being made to drop water and foam on fires in 5 gallon tin cans, paper bags, and in 8 gallon oak beer kegs attached to a parachute. The results were disappointing but the dreams continued to grow with the development of technology. Aerial photography was implemented in 1925 and free falling supplies to firefighters was first employed on fires in 1929. During this same period, non-emergency parachute jumps were occasionally being made in the military and by thrill seeking barnstormers.

In 1934, T.V. Pearson from the Intermountain Region (R-4) of the Forest Service proposed the use of parachutes as transportation for firefighters. A professional parachutist, J.B. Bruce, made a few demonstration jumps but the response from the Washington Office was disfavor able.

In 1935, The Washington Office founded the Aerial Fire Control Experimental Project. Located in California, the project conducted experiments in dropping water and chemicals on fires from aircraft. These fire retardants proved impractical, but improvements in cargo delivery by parachute helped set the stage for later experiments with parachute jumping.

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In the spring of 1939, The Aerial Fire Control Experimental Project directed all of its efforts into parachute jumping. Led by David Godwin, the Project was moved to Winthrop, Washington. Beach Gill and Frank Derry from the Eagle Parachute Company were hired as consultants. Seven experienced jumpers and two local men were added to the project crew. During the summer of 1939, approximately 60 live jumps were made successfully into rough terrain on the Forests near Winthrop.

II. BEGINNING OF THE PARACHUTE PROJECT

1940—This was the first operational season for the Parachute Project. A crew of six smokejumpers was established in Region 6 at Winthrop, Washington and a crew of seven was established in Region 1 at Moose Creek, Idaho. Frank Derry was hired as an instructor-rigger for both bases. In June 1940, Major William H. Lee, of the U.S. Army visited the Region 1 jumper training camp at Seeley Lake, Montana. He later incorporated Forest Service techniques in the establishment of the U.S. Army Airborne. Major Lee commanded the 101st Airborne during World War II and became known as “father of the Airborne Troops.”

On July 12, 1940, Rufus Robinson and Earl Cooley made the first fire jump in Region 1 over Martin Creek on the Nezperce National Forest. On August 10, 1940, Francis Lufkin and Glen Smith bailed out over Bridge Creek on the Chelan National Forest in Region 6. Nine fires were jumped that year and their early suppression saved an estimated \$30,000, or three times more than the entire cost of the project.

On July 15, Chet Derry made the first rescue jump in history on a plane crash in the Bitterroot National Forest.

1941—In 1941, the entire parachute project was centralized at Missoula, Montana. It was less expensive to dispatch jumpers from Missoula to other Regions than to maintain permanent facilities in those Regions. Missoula was chosen because it was the home of Johnson’s Flying Service, the private contractor supplying aircraft and pilots for the project.

A total of 16 jumpers trained at the Ninemile training camp, 20 miles west of Missoula. After training, eight jumpers were sent on project work to Moose Creek on the Nezperce National Forest. Eight more were sent to Big Prairie on the Flathead National Forest, and the rest remained at Ninemile.

A serious outbreak of fires in Region 6 was the only real fire threat in 1941 and again only nine fires were jumped. Still, the program accounted for considerable savings in fire suppression costs and more than proved its worth.

III. WORLD WAR II YEARS 1942-1945

1942—The Second World War depleted the supply of qualified personnel available for smokejumping. In 1942, only five jumpers returned to smokejumping from the previous year. Thirty-three jumpers trained at Ninemile that year, but only a few of them had any previous fire experience. These jumpers were stationed at Ninemile, Moose Creek, Big Prairie, and Seeley Lake. Francis Lufkin set up an air cargo program at the Twisp Ranger Station near Winthrop, Washington and continued this operation until 1945. During this time, he also helped with jumper training at the Ninemile Center.

1943—By spring of 1943, the personnel shortage had reached a critical stage. Only five jumpers were available including the instructor. The most strenuous recruiting efforts yielded only four jumpers whose youth or minor physical defects had kept them out of the military. In the meantime, a number of inquiries had been received from individual 4-E (conscientious objector) draftees in public service camps. The end result was that 70 smokejumper candidates from the Civilian Public Service trained at Ninemile. The same year the project trained 25 personnel from the U.S. Coast Guard, the Canadian Air Observers School, and the U.S. Air Force for pararescue work.

In 1943, the Parachute Project expanded to other regions. New bases were established at McCall, Idaho (R-4) on the Payette National Forest and at Cave Junction, Oregon (R-6) on the Siskiyou National Forest. Each base received one squad of smokejumpers from Region 1.

1944—The Civilian Public Service smokejumper program was expanded in the spring of 1944 to 110 men. The number of jumpers assigned to each of the three regions was proportionately increased. Training of the inexperienced and most of the experienced jumpers was conducted at the Ninemile training facility in Region 1. The Smokejumper Project was officially adopted by the Forest Service in 1944 and was no longer considered to be in trial stages. Consequently, a number of National Forests reduced their ground forces and relied totally on smokejumpers.

1945—Continued expansion of the C.P.S. program and returning war veterans increased the number of jumpers to 220. Training was conducted at Ninemile and the jumpers were stationed at Missoula, Montana and Cave Junction, Oregon. During the severe fire season of 1945, smokejumpers proved to be an invaluable firefighters.

Members of the 555th Battalion of Black Paratroopers were trained in timber jumping and firefighting to combat Japanese balloon fires. This was done at Pendleton, Oregon by instructors from Missoula. The 555th was stationed at Winthrop and from that base 98 paratroopers and 10 Forest Service jumpers were dropped on the Dean Creek Fire. The expected Japanese incendiary balloon

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menace did not materialize but the 300 paratroopers were used as suppression crews on large fires through west. These paratroopers were and are referred to as the “Triple Nickel”.

In addition to the 55th, 14 military pararescue jumpers were trained in rough terrain jumping in 1945.

IV. REGION 1

1946—With the end of the war the Civilian Public Service jumper program was discontinued. In 1946, there were 164 jumpers in Region 1. Eight-four percent were war veterans and 40 percent of the total were college students.

1947—Regions 4 and 6 developed training centers of their own. A smokejumper base was established in Region 3 to serve the Gila National Forest. A crew of nine jumpers set up operations at the Demming Airport in Demming, New Mexico. The Canadian government conferred with personnel at Missoula and began development of a smokejumping project of their own. Region 1 trained 20 military jumpers that fall.

1949—Four jumpers from Missoula flew to Washington D.C. in a Ford Tri-Motor and made a demonstration jump on the White House lawn. The fire season of 1949 was extreme. Twelve smokejumpers and a District guard (former jumper) were fatally burned on the Helena Forest’s Mann Gulch Fire. Feasibility tests were conducted in the use of helicopters for smokejumper retrieval at Moose Creek Ranger Station.

1951—This year marked the beginning of the West Yellowstone Base with a crew of five jumpers and the Grangeville base with a crew of eight jumpers. In late August, 61 Region 1 jumpers were sent to Cave Junction as a booster crew.

1952—The Region 3 crew (increased to 18) moved from Demming to Silver City, New Mexico.

1954—President Eisenhower dedicated the new Aerial Fire Depot facilities in Missoula, Montana. These facilities are still in use, although have gone several makeovers.

1955—The Region 3 crew was made up of 12 jumpers from Region 1, 3 from Region 4, and 3 from Region 6.

1958—The Region 3 crew was increased to 24 with 8 jumpers coming from Region 4 and the rest from Region 1.

1959—129 jumpers were stationed at Missoula, 16 at Grangeville, 24 at Silver City, and 5 at West Yellowstone. Missoula trained 17 experienced smokejumpers

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that were recruited by the Bureau of Land Management in Fairbanks, Alaska. This marked the beginning of the BLM smokejumpers.

Two jumpers, a Forest Supervisor, and the pilot of a Ford Trimotor died in an airplane crash at Moose Creek, Idaho.

1960—A career development plan was adopted for forestry students who desired field training. They were given refresher training, then assigned to a Forest, and were subject to recall for fire duty. This marked the first year that 20 jumpers were detailed to Alaska in June.

1961—The number of jumpers increased to 171.

1962—West Yellowstone increased in number from 5 to 9.

1963—On August 4, 105 jumps were made on 35 fires, a record for the Region for one day.

1964—Pararescue personnel from the Air Force X-15 project were given rough terrain jump training in Missoula which continued through 1967.

1967—New facilities at West Yellowstone were built and the base was manned with 13 jumpers.

1970-1971—Numbers were reduced from 190 to 170 within Region and use of jumpers as organized ground crews increased due to budget cuts nationally and the need for ground crews.

1974—Region 3 and West Yellowstone had record fire seasons. Fireline explosives were used on a fire for the first time by jumpers.

1975-1985—Jumping activity varied depending on the season. Jumpers were used as boosters to Alaska and to support Silver City, New Mexico. Project crews were based at Plains, Lincoln, Condon, and Hamilton for a period of time and the first women were trained in Region 1 in 1982.

1986-1995—1988 was extremely busy with fire activity throughout the Region, especially around West Yellowstone. Booster crews were brought in from around the west. The rest of the years varied in activity.

1996-2001—Silver City continues to be a spike base operation of Region 1. Movement of jumpers around the west is common and the fire season of 2000 is extremely busy with several days of dry lightning igniting numerous fires. Ed Ward is named the new base manager at Missoula. Greg Anderson remains in charge at West Yellowstone and Jerry Zumalt leads the Grangeville Base.

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V. REGION 4

1943—5 jumpers were trained at Missoula, Montana and sent to the Intermountain Region at McCall, Idaho on the Payette National Forest. A Travelaire owned by Johnson's Flying Service and piloted by Pen Stohr, was used for dropping jumpers.

The first fire jump out of McCall was made on August 14, 1943, by John Furguson and Lester Gohler at the head of Captain John Creek. The spotter, Stewart "Lloyd" Johnson, served as the McCall base foreman through the summer of 1953.

1947—C.C.C. buildings were moved in for smokejumper operations and training facilities were built. McCall trained 50 jumpers in 1947.

1948—10 jumpers were positioned at Idaho City, Idaho with James "Smokey" Stover in charge. Stover remained in charge when the based was moved to Boise, Idaho and retired in 1973.

1955—McCall contributed 3 jumpers to the 18 jumper Region 3 crew for the first time.

1957—Francis "Del" Catlin became the unit manager and served to 1977.

1958-1964—A laundry building and three barrack buildings were constructed as well as a new loft building. A new kitchen was built in 1964.

1965—On July 9, a Johnson's Flying Service Twin Beech crashed while dropping cargo. McCall squadleader Ken Salyer and pilot "Skip" Knapp were killed.

1974—McCall assigned 15 jumpers to the Alaska detail crew for the first time.

1977—Harry Roberts became the McCall unit manager and served until 1984.

1980—The Boise smokejumper based was closed and McCall became the base for Region 4.

1984—Neil Davis became the McCall base manager and is still in place in 2001.

1985-2001—McCall maintains 70-80 smokejumpers and during the years when numbers were reduced due to budget, Alaskan BLM smokejumpers were detailed down in August to supplement the numbers. One turbine DC-3 and two Twin Otters compliment the base and allow for movement around the Great Basin with several sites opened as spike base operations. Level of activities varied throughout this time period with peak activities in 1994, 96, and the 2000 season.

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VI. REGION 5

1944--Jumpers from Cave Junction, Oregon were dropped on fires on the Sequoia National Forest. This was the first use of smokejumpers in California.

1957—A permanent base was set up in Redding, California. The new base was administered by the Shasta-Trinity National Forest. A crew of 26 jumpers were trained at Cave Junction.

1959—A spike base at the Columbia, Cal. Airport was used to cover the High Sierras. The first use of jumpers in Yosemite National Park occurred this year.

1960—“Fifty jump” pins were earned by Redding jumpers for the first time. Activity was very busy through November.

1962—This was the first year of the detail or “retread” program. New jumpers were selected from Region 5 forests and detailed to the jumper base. These individuals underwent an intensive training program that included smokejumper training, leadership and instructor training, hydraulics, and advanced fire behavior. At the end of the season, these retreads would return to their original units. They would be regular jumpers for only one season.

1963—The “retread” program was initiated this year. Jumpers that had previously trained via the detail program received a 5 day refresher, returned to their home unit, then were called in when activity increased and additional jumpers were needed.

1970—The first fatality associated with parachuting occurred on June 3, 1970. The accident was attributed to a poor exit and a misrouted static line. Redding jumpers were used as twenty person crews when initial attack activity decreased.

1974—This was the last year of the “retread” program.

1976—The crew increased to 41 jumpers.

1979—Two groups of beginning jumpers were trained this year. The first session was in Redding and the second was a combined session in Missoula.

1981—Tragedy struck Redding when on May 11 a Forest Service aircraft crashed into the paracargo building at the base killing the four people on board. The ensuing fire completely wiped out the Redding jumpers equipment, bft, and facilities. Temporary quarters were set up in the aircraft maintenance hanger and equipment was borrowed from other Regions. The jumpers were back in operation by June 10.

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1983—This was the third and final year of operation in the hanger as new facilities were nearing completion and the move took place in the spring of 1984 when the new facility was completed.

1984-2001—The number of jumpers at Redding stayed around 45. Fresno was used as a spike base operation on several occasions. A diverse workforce with female jumpers was established. Jumpers were used not only in fire, but for a variety of forest projects, prescribed fire, and tree climbing. 1999 was a enormous year for Northern California and Redding was boosted with a total of close to 200 jumpers. They were used as 20 person crews and on numerous initial attack fires.

VII. REGION 6

1939—Smokejumper training was initiated at Winthrop, Washington.

1943—Region 6 established a base at Cave Junction, Oregon.

1944—Smokejumpers from Cave Junction made the first fire jumps in Region 5.

1945—Winthrop, Washington was the location for the North Cascades Smokejumper Base. It was reestablished as a permanent base.

1948—Training facilities were constructed at NCSB, but were destroyed by floods.

1949—Training facilities were reconstructed at NCSB. Eight jumpers were stationed at Cave Junction, Oregon.

1950—Spike bases were staffed in eastern Oregon.

1954—The NCSB crew expanded to 32 jumpers.

1956—Northeast Oregon jump crews were moved to LaGrande, Oregon.

1957—Cave Junction trained the original Redding Crew.

1958—A tragic crash of a USFS Twin Beech claimed the lives of the pilot and three Winthrop jumpers. The crash was attributed to severe air turbulence while dropping cargo.

1964—A smokejumper unit was established at Redmond, Oregon. The original crews came from Cave Junction and Winthrop which now had 41 jumpers.

1970—A record setting year for fire activity in Region 6. NCSB and booster crews made a record 1,066 jumps on 223 fires.

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1971—Smokejumper operations were initiated in Region 8 by a crew from Cave Junction.

1974—The LaGrande Fire Control Center became an independent smokejumper unit.

1977—Redmond set a record for number of fires jumped with over 160 fires taken action on.

1981—NCSB was reduced to 11 jumpers and Redmond was increased to 60 in a “centralized effort”. Redmond became a core base and NCSB was a satellite base. Cave Junction was closed.

1982—LaGrande jump base was closed. Redmond absorbed some of the jumpers from this closure.

1983-2001—The number of smokejumpers in Region 6 was established at 55, with 35 jumpers at Redmond and 20 at Winthrop. Those numbers varied depending on severity budgeting. The first female jumper was successful in 1983 within the Region with several making it through training during the 90’s. Activity within the Region varied during the period with peaks in 90 and 94. Booster activity increased with travel a norm.

XIII. BLM ALASKA

1959—The Alaska Fire Control Service was implemented in 1939 and suppressed fires on a limited basis. During World War II, the AFCS and the military suppressed fires in Alaska. Smoke from these fires was a hindrance to flight and was considered a threat to national security. The AFCS was absorbed by the BLM in 1946. An extreme fire season in 1957 prompted the BLM to consider using smokejumpers in Alaska. The BLM activated a smokejumper unit with 17 jumpers. A Fish and Wildlife Service DC-3 was used and a loft facility was constructed.

1962—Along with other activity, four men were used during the summer to jump from helicopters and clear helispots at section corners so that engineers could survey at a faster rate. This program continued through 1966.

1963—Inexperienced jumpers were trained for the first time in Fairbanks.

1965—A separate base was established at Anchorage. Anchorage was a base until 1972. McGrath was also used as a spike base.

1966—A jumper was killed while making a letdown from a tree.

1970—New loft facilities were built at Ft Wainwright near Fairbanks.

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1972—Alaska jumpers were given functional responsibility of air cargo operations.

1974—Smokejumper operations were moved to Ft Wainwright.

1976—Fireline explosives were first tested by BLM jumpers in 1976.

1978—The Alaska crew was expanded to 69 jumpers. A loft building was moved to the Ft Wainwright site.

1979—Ram-air parachutes were first tested in Alaska.

1980—Alaska jumpers were sent to Grand Junction, Colorado to support initial attack activity in the Great Basin.

1982—Fire suppression under BLM control was reorganized into a single statewide entity—the Alaska Fire Service. The Ram-air parachute was first used on fires.

1983—Alaskan jumpers were increased to 100. A total of 1,725 fire jumps were made in Alaska. Ram-air parachutes were first used in the Great Basin on fires.

1984-2001—The Ram-air parachute evolved with a drogue system of deployment. Activity varied throughout this period, however fire suppression policies within the state continues to decrease the lands needing full suppression. Boise is established as a separate BLM base to cover the Great Basin. Mike Clarkson leaves Fairbanks to head up that operation.

VIII. EQUIPMENT

1939—The main parachute canopy was a 30 ft. diameter backpack, manufactured by the Eagle Parachute Company. The reserve was a 27 ft. chest pack. Both chutes were constructed so that they would face into the wind automatically. They could be turned but had negligible forward speed. Both chutes were activated by ripchords. A one-piece heavy canvas suit was tried first. A lighter, two-piece, felt padded suit proved to be more practical. A wire mask was fitted on a leather football helmet to protect the head. A cotton webbing, quick attachable harness was used. The outfit also included a wide leather and elastic belt to guard against back and abdominal injuries during parachute opening. Leather ankle braces were used over the logger style boots. One trouser leg of the suit had a pocket to carry a rope for tree letdowns.

1941—The static line was adopted.

1942—Frank and Chet Derry invented the Derry slotted chute. These slots increased stability, turning speed, and forward speed.

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1945—The FS-1 parachute was first used. This chute was a 28 ft. flat circular canopy with 7 foot Derry slots, 7 gores apart. These chutes were manufactured by the Irving Parachute Company.

1953—Drawings for crepe paper streamers were made. The Missoula Aerial Equipment Development Center was founded. It was later changed to Missoula Equipment Development Center and then to Missoula Technology Development Center (MTDC) which was the focal center for development of smokejumper equipment.

1954—The FS-2 parachute was first used incorporating “slots and tails”. This canopy was nearly identical to the FS-1 except that it had material extensions on the back three gores.

1956—The FS-5, a 32 ft. flat canopy with 7 ft. slots and tails was first used. The H-3 harness was also incorporated.

1960—The FS-5A was introduced. This canopy was identical to the FS-5 except that it had 10 ft. steering slots. A white nylon jump suit was adopted. Fire shelters were made available but were not required until 1978.

1963—This was the first year that D-bags were used. This greatly reduced the opening shock experienced by jumpers.

1969—The FS-9 was an experimental canopy. The final version was designated the FS-10.

1970—The FS-10, a military style 35 ft. parabolic canopy was adopted. It had a 7-TU modification in back that gave it more forward and turning speed than the FS-5A. The FS-10R reserve was adopted in conjunction with the FS-10.

1977—The FS-11 was an experimental chute which went through testing, but never made the cut.

1978—The anti-inversion netting was first used on Forest Service personnel parachutes. This netting practically eliminated the possibility of inversion type malfunctions, the primary type of malfunctions for Forest Service parachutes.

1980—The FS-12, a 32 ft. flat circular, multiple porosity parachute was adopted. It also had Russian style turning slots with the addition of two large drive windows.

1983—The Ram-air parachute system became operational for BLM jumpers.

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1997—After several versions of the Concept 7, the FS-14 was adopted as the Forest Service parachute. It has three sizes, small – medium – large, which are 28 ft., 30 ft., and 32 ft. in diameter. A size chart was developed for use depending on weight of the jumper. The new design allows for much quicker flat turns with a forward speed of 10 miles per hour.

IX. AIRCRAFT

Stinson (1939)—the first aircraft ever purchased by the Forest Service. It was a five-place, high wing, single engine, airplane used at Winthrop, Washington during the experimental jumping of 1939.

Curtis Travelair (1940-1969)—This airplane carried four jumpers. It had high wings and a single engine.

Ford Tri-Motor (1941-1969)—This airplane carried eight jumpers and their cargo. It was large, slow flying, high winged, and had three engines—one on each wing and one on the nose.

UC-64 Noorduyn-Norseman (1945-early 50's)—This was a high wing, single engine aircraft that carried four jumpers and cargo.

DC-3 (1944-1970's)—A large low winged, two engine aircraft that was capable of carrying up to 16 jumpers.

DC-2 (50's and 60's)—This was slightly smaller than and similar to the DC-3. It carried 12 jumpers and cargo.

Twin Beech (early 50's-early 70's)—The twin beech had low wings, twin engines, and carried four jumpers and cargo.

Turbo Porter (1966-1968)—Used in McCall and Grangeville, it carried four jumpers. This was a high wing, single turbine engine airplane.

Twin Otter (1968-present)—The twin otter has high wings, twin turbine engines, and can carry eight to ten jumpers. It is an excellent STOL aircraft for backcountry strips.

Lockheed Lodestar (1957-58)—Used in Redding, California. This aircraft had high wings and twin engines. It carried four jumpers and cargo.

C-46 (1960-1970)—This airplane was similar to the DC-3. It had a much bigger belly, carried 32 jumpers and was primarily used in Region 1 and 5.

B-26 (1973)—This was only used in Alaska.

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Fokker (Late 50's)—Use was limited to West Yellowstone.

Beaver (60's)—This was a high winged, single engine aircraft. It was owned by the Forest Service and carried four jumpers. Only one fire jump in Region 1 was every made out of the Beaver.

Cessna 206 (Late 60's-80's)—This is a high winged single engine aircraft that carried two jumpers and cargo.

Caribou (1972-early 80's)—This was a high winged, twin reciprocating engine airplane capable of carrying 20 jumpers. It had a large rear door exit and was used primarily in Region 1.

Volpar (1974-late 80's)—The volpar is an extended twin beech with turbine engines and carried eight jumpers and cargo. It lost its' status when one went upside down while doing a practice jump in Alaska. Fortunately, it uprighted with enough elevation to return to base and land.

Grumman Goose (1960-early 70's)—It had high wings, twin engines, and can land on ground or water. It was only used in Alaska and could hold four jumpers.

Bell 212 (April 1976)—This was a twin turbine engine helicopter that was only tested and never used for jumping.

Aero Commander (1959-1975)—This was a high winged, twin turbine engine aircraft capable of carrying only two jumpers.

Beech 90 (1978-early 90's)—This was also called the King Air 90, a small twin engine, low winged airplane capable of carrying four jumpers. The Forest Service owned one and was used at several bases.

Beech 99 (1974-early 90's)—This was a low winged, twin turbined, fast airplane capable of carrying six to eight jumpers. The Forest Service owned one and was used at several bases.

Beech King Air 200 (1974-early 90's)- This was a twin turbined, fast airiplane similar to the 99, but with a high T tail. It carried six to eight jumpers and cargo.

Sky Van (1976)—This was a twin turbine, high winged airplane with a large rear exit door. After a one-season trial it was not used again.

Banderanti (1983-late 90's)—This was a Brazilian made aircraft similar to the Beech 200 with twin turbines capable of carrying eight jumpers and cargo.

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Casa 212 (1981 to present)—The Casa was a Spanish built aircraft, high winged, twin turbined, with a large rear opening door. Exits are done from a side door. Capacity is eight jumpers and cargo.

AT-11 (1966-1967)—Use was limited to Redding, California.

TDC-3 (mid 80's to present)—Two Forest Service DC-3's were converted over to twin turbines. The airframe was taken totally apart and the fuselage was extended with the turbines added. This airplane is capable of carrying 20 jumpers at over 200 knots. Contract TDC-3's were introduced in the 90's.

Sherpa C-23A (90's to present)—Developed by the Shorts Brothers of Ireland, this short winged, twin tailed, twin turbines aircraft is capable of carrying 12 jumpers and cargo. It is boxy in design with 30% of its' lift capacity coming from the fuselage. Exit is side door.

Dornier 228 (90's to present)—This fast, twin turbined aircraft is capable of carrying 10 jumpers. It has an inflight door allowing the airplane to fly in excess of 200 knots until time to go into jump configuration.

Grand Caravan (90's to present)—The high winged, single turbined aircraft was tested in the 70's, but didn't get totally evaluated until 1999 out of Grangeville. It proved capable of carrying six jumpers and cargo.