

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
NORTHERN REGION



ADDRESS REPLY TO
REGIONAL FORESTER
AND REFER TO:

FEDERAL BUILDING,
MISSOULA, MONTANA

F
STUDIES
Aerial Control
Parachute Jumping

March 8, 1941

F-23

FOREST OFFICERS:

A copy of the 1940 report on the parachute project, including tentative plans and job descriptions for 1941, is being forwarded for your library. This report should be useful in answering questions on the use of parachutes, asked of you by the public. One of the values of the parachute project is to emphasize to the public the need for speed in the delivery of skilled firefighters to all fires, early enough to prevent damage and high costs. The principle is the same whether the men go on foot, horseback, by motor vehicle or parachute.

It should be made clear to everyone that the plans for 1941 are tentative only, since we have absolutely no assurance there will be any funds for the project. The availability of funds depends entirely upon action by Congress.

Job descriptions and classifications have not yet been approved by Civil Service, therefore no publicity should be given to the proposed salary rates. However, they may be used to supply information to guards or other employees who may be interested in applying for parachute work.

The report may serve as a guide to those of you who may in the future be in a position to call for parachute firefighting service on your unit.

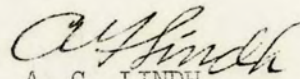
There is also being forwarded for your library, an informational description of the aerial delivery of firefighting supplies and equipment in Region One. This should also be regarded as a source of information to answer questions to the public. It will serve too, as a guide to better field understanding of the parachute delivery techniques. This is essential to making aerial supply service a fully integrated and understood part of fire control service of supply.

Both these documents may serve as the basis for local press

F. O.

releases if desired. Please omit from such press releases, any specific reference to salary or classifications; also avoid any statement which would indicate we are certain of having a parachute project in the future. You may, however, include the statement that plans for expanding the project are ready, so we will be ready to go if Congress appropriates the funds.

Very truly yours,



A. G. LINDH,
Assistant Regional Forester,
Division of Fire Control.

Enclosures

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December 10, 1940

REPORT ON AERIAL FIRE CONTROL ACTIVITIES

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By
Merle Lundrigan, Project Leader

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OUTLINE FOR WRITE-UP AERIAL FIRE CONTROL PROJECT, 1940-REGION ONE

PARACHUTE JUMPING

Introduction as to plans for purchase of equipment, the personnel,
the training, the application and work projects.

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AERIAL FIRE CONTROL PROJECT - 1940 - REGION ONE

Parachute Jumping

Tentative plans were made from tests conducted in 1939 and Region Six plans for 1940. They developed or selected equipment, jumping technique, recruitment standards and training plans used in Region One in 1940. Financial estimates were made for the aerial fire control project based on eight jumpers.

Region Six was allotted F.Y. 1940 funds for the purchase of equipment for Regions One and Six.

Obtaining Supplies

All jumping equipment was purchased by Region Six for Region One from their bid specifications. The purchase of loft equipment was made locally. Other supplies and small equipment were purchased as needed during the season.

The radios were purchased by Region Six on bids through the Forest Service Radio Laboratory.

Recruiting Personnel

The recruitment plan had as its objective the obtaining of only the most skilled and experienced firegoers and fighters. Further, the recruits were to be well qualified as fire suppression crew foremen. They were required to be between 21 and 35 years of age and to weigh not over 190 pounds. Each man must pass the Civil Aeronautics Authority private pilot's physical examination. Any tendency toward hernia or heart disease prevented qualification. In addition, the recruit must be free from excessive nervous reaction before and after actual jumping trials.

The supervisors of the forests in Region One which have large, roadless areas, were contacted and each asked for not to exceed three volunteers from the fire guard organization.

There were no shortages of applications from young fellows who lacked fire experience. Nearly 100 such applications were received in spite of the fact that none were solicited. From the experienced fire men, 16 applications were received. Since only that number had been solicited, it can be said that no difficulty was encountered in recruitment of the type of men needed. The salary was to be \$193 per month for two and one-half months. Since the pay of the men recruited averaged above \$135 per month for a longer season, it appears that the offered increase was not in itself a strong inducement to take what seemed to be a considerable added risk.

Seven men were finally selected on the basis of experience, without considering their physical condition.

The seven men were notified only a day or two in advance of the time training was to start. This was done to reduce the "worrying" time of the recruits. Only one failed to pass the physical examination. The remaining six recruits comprised the group which actually started training. A licensed parachute rigger and jumper, later trained in fire suppression work, was added making a squad of seven.

Training for Jumping in Fire Control

An ideal training location should be one isolated from spectators' interference and aerial traffic. There should be readily available, sufficient variations in topography and cover types to permit the training to be carried out under conditions that will be found in parachuting to actual fires. Further, there should be a level opening approximately one-quarter mile square to be used by beginners for first jumps. The surrounding terrain should not be rough and should be free of snags, rivers, lakes or dead-topped trees.

An area meeting these requirements was found adjacent to the Forest Service landing field at Seeley Lake, some 35 air miles northeast of the city of Missoula, Montana. Since the contract airplane used was based at Missoula, the training expenses were increased by the cost of flying to and from the training field each day.

The training in 1940 cost a total of \$330.38 per man. This should be reduced in the future to about \$260 for each new recruit, if several squads can be trained at once.

Actual training at Seeley Lake landing field started June 22 and ended July 3.

Basic instructions were given to the men orally, then three experienced jumpers (two jumper-riggers and one smokejumper trained at Winthrop, Washington in Region Six) made demonstration jumps while the instructor-rigger explained the maneuvers made.

Demonstration and practice of let-down technique was the next step. The new jumpers made their first jumps at Blanchard Flats. Each new jumper made three jumps at Blanchard Flats and at least one on the landing field before any jumps were made in the timber. Then each made two or three timber jumps, spotting themselves, going through the procedure of let-down and retrieving the parachute from the trees. Instructions were given the new men gradually by intermingling the ground instructions with the jumps.

As the training progressed only one of the seven trainees had to be released from the squad because of unsuitable nervous reactions. This

one jumper was eliminated after his third jump. There was a fair chance he might eventually have developed into a skilled jumper but the objective was to obtain only the highest quality jumping performance. High training costs and the need for taking every safety precaution make high standards desirable.

Two minor injuries occurred during training. One man strained his shoulder muscles in some unknown manner so that he could not jump for several days. The other minor injury was caused by a beginner landing with his feet too far forward, causing his heels to slip and landing him in a sitting position. Both injuries occurred in a 20 to 30 mile wind in open country. A wind of 15 miles is probably the upper limit of safety for beginners. Tree landings would have afforded less risk on a windy day than landing in the open.

Dispatching on Fires

After the training was over the squad was moved to Moose Creek Ranger Station and landing field on the Bitterroot National Forest, under the charge of the project leader. The project leader and the squad were placed under the administration of the district ranger, who had familiarized himself with the project by observing part of the training program. He was given broad administrative jurisdiction with authority to dispatch jumpers to fires as he saw fit.

As a fire was reported the ranger would decide if the smokejumpers were the men to go. All men and equipment were assembled to go at a minute's notice. The ranger or his dispatcher would give the project leader the location of the fire as the lookouts would report it. The project leader would fill out Form R-1F 17 in two copies and two maps with the location marked on each. One copy of the Form R-1F 17 and one map were used in the plane by the project leader and the other copies by the smokejumpers after landing. The ranger would order the airplane for smokejumping through the Fire Desk in Missoula, while the project leader lined out the men to jump to the fire, as to who was to go and what equipment would be needed. The smokejumper picked his own intended landing spot.

When it was indicated that the parachuters might be effective on an important fire on any other ranger district on the Bitterroot or on another forest in the region, the fire dispatchers in the supervisor's and regional office respectively, had authority to dispatch them to it.

In-season Training

Training was carried on during the season at Moose Creek. Each morning was spent in let-down practice and jumping from a mock-up airplane to develop the technique of take-off from a plane. Each jumper received two or more practice jumps from the contract airplane during the season. Each jumper should be given a jump from a plane at least every two weeks. Practice on the ultra-high frequency radios, used by the smokejumpers was given at least twice a week to test sets, batteries and to develop their

use. Some trouble was experienced in understanding some of the jumpers over the radio. Their voices were not clearly received.

Equipment in Readiness

Equipment for the six jumpers was kept in readiness at all times. Each jumper was equipped with a complete jumping and smokechasing outfit. It was his responsibility to see that the equipment assigned him was in serviceable condition and ready to go at all times. Each jumper's equipment was inspected after each jump by the rigger and project leader. All equipment such as radios, radio batteries, let-down ropes and tools used in fire suppression, were inspected twice a week. This inspection was made whether they had been used or not.

Use of Personnel

The jumpers were dispatched to nine different fires to which they jumped. The squad was used on a ditch construction job at the Moose Creek Ranger Station. Three of the squad were used on project fires during the season as camp boss, head timekeeper, crew foreman and supply and transportation boss.

Financing and Cost

The project was financed entirely by Aerial Fire Control funds.

Table of costs, 1940 season:

<u>Items</u>	<u>F.Y. 1940</u>	<u>F.Y. 1941</u>
Wages	\$ 678	\$ 2,849
Supplies and small equipment	445	315
Non-fire transportation and training flying	602	531
Travel and miscellaneous	232	361
Subsistence and freight to Moose Creek	700	
Flying time on fire suppression		1,484
Total	2,707	5,540
Estimated calendar year 1940 depreciation on equipment (5-year life)		800
Grand Total for 1940 Season		<u>\$9,047</u>

All equipment other than that listed above was purchased by Region Six for Region One and is not included in the above statement.

Storage of Equipment

At the close of the season all equipment was brought out from the Moose Creek Ranger Station and stored at Missoula under the care of the Fire Control office. Some of the equipment has been held intact for the use of the emergency squad headquartered in Missoula.

Write-ups of Jumpers on Their Experiences

(Letters attached.)

Conclusions of Project Leader Lundrigan

1. I believe the delivery of skilled and well-trained parachute jumping firefighters can be done safely in rough timbered terrain in winds up to 30 miles per hour and at altitudes up to 8,000 feet.
2. Equipment and jumping methods can be more simple and less costly.
3. Training should be intensified in physical conditioning, jumping and firefighting.
4. Longer season employment is very essential to insure the returning of trained men.
5. Organized parachute squads will prove effective as a highly mobile unit to operate in the back country where transportation is slow.
6. Final determination of the number of parachutists which will prove most economical for a given forest area probably cannot be made for a number of years.
7. The dispatching of parachutists should be done by a man with the best possible judgment and good knowledge of the conditions existing, so the fires selected will be those on which quick action will pay the greatest returns for the special control service.
8. The project should be considered and managed as experimental for many years, even though application was successful and proved a money-maker in the first year of trial.
9. Parachuting, as an aid to forest fire control, will probably not prove economic in forest areas where the planned road system has been completed.
10. The required type of airplane and a pilot skilled in mountain flying must be available during times of possible need.
11. Training new men in jumping practice should be carried out in early morning hours.

12. It is not a good plan to tell a new jumper too much about the job of chute-jumping before he has made a few jumps. He should know enough to keep himself out of trouble but if he is too well informed in regard to all his dangers and what can happen on his first two or three jumps, it is inclined to unnerve him.

13. To be competent in judging distance, area, wind directions and velocity from a plane can only be accomplished by continuous practice and checking from known areas on the ground.

14. I cannot stress too greatly the importance of having the names of the lookouts painted on the roofs or shutters of the lookouts in a manner so they can be read from the air.

15. An inspection of all Forest Service landing fields should be made before the fire season by a qualified inspector.

16. All airplanes used for smokejumping should be bonded to insure radio reception.

17. I do not think that any member of the parachute squad should be dispatched to a project fire to take a job of lesser importance than the one he is leaving in fire protection.

18. I believe that the project leader and the airplane contractor should have a definite line-up of authority and responsibility.

DESCRIPTION OF FIRST ACTUAL FIRE JUMP

IN THE UNITED STATES

By

Rufus Robinson

On July 12 at 2:00 p.m., Merle Lundrigan asked me to go to a fire on the head of Martin Creek, Section 35, Township 31 North, Range 11 East. I started collecting my jumping suit, fire pack and equipment to take to the fire. Rest of crew helped haul all equipment out to the airport.

Dick Johnson arrived from Missoula at 3:05 p.m. with plane. One of the crew helped me dress and get into the harness of chute. At 3:21 $\frac{1}{2}$ we left the ground. Johnson headed the plane down river to gain elevation. Turned at Goat Mountain and headed back toward Bear Creek. Turned again and followed Ditch Creek, over top of Moose Ridge close to Wyles Peak lookout. Spotted fire on east slope of Martin Creek. Johnson circled fire at about 7,000 feet elevation. Fire looked to be about two and one-half acres in green timber fairly open. I asked Johnson to take plane up higher, to around 7,600 feet. He circled over fire once more and spotted alder patch of about two acres, above fire, to jump into. Dropped burlap test chute at 3:55 p.m. Chute drifted down into Martin Creek, north and east of the fire.

I bailed out at 3:57 $\frac{1}{2}$ p.m. Wind had changed between time of dropping burlap test chute and when I jumped. I caught a down-draft and heavy ground wind, carrying me over alder patch half mile north. Landed in small green tree, 25 feet tall. My feet were about two feet above ground. Unhooked harness and set up radio. Talked to ship at 4:03 p.m. Lundrigan reported Earl Cooley had landed northwest of me in tree. Lundrigan agreed to hold up dropping of fire packs until I reached Cooley. I misunderstood location of Cooley, and after waiting 15 minutes, Lundrigan dropped fire packs near Cooley.

We started on fire line at 4:45 p.m. Cooley started working around north side of fire, throwing dirt on hot spots and building some fire line. I took the south side, cooling down hot spots and building some fire line. Worked until 7:00 p.m. when I sent Cooley back to find the other fire pack. He met four-man maintenance crew 300 yards from where his chute was hung up in the tree. They said they would be down to help us early next morning. Cooley did not find fire pack so came back to fire at 9:00 p.m. We worked on fire line until 10:00 p.m., ate lunch and watched rest of the night for snags falling across fire line. Had coffee at 3:30 a.m. Started building more fire line at 4:00 a.m. Fire controlled at 10:00 a.m. Four-man crew took over at 10:00 a.m. Had lunch at 12:30 p.m.

Cooley and I started after chutes with one mule, at 2:30 p.m. Arrived back to fire at 6:30 p.m. We spent one hour looking for saw and

climbers. Thought Lundrigan had dropped them although neither Cooley nor I saw them dropped. Maintenance crew found second fire pack on their way to fire.

Packer Howard Engle, Earl Cooley and I left for Moose Creek at 7:50 a.m. July 14. I arrived Moose Creek 3:10 p.m. Cooley and Engle stayed at Tony Point lookout over night.

DESCRIPTION OF SECOND ACTUAL FIRE JUMP
IN THE UNITED STATES

By

Earl Cooley

On July 12, at 1:40 p.m. our project leader, Merle Lundrigan, was informed of a fire on the Nezperce Forest on which two of us jumpers were requested. Rufus Robinson and I were selected to go. The plane was ordered immediately after we received the fire call. While the plane was on its way from Missoula to Moose Creek Ranger Station the group had collectively gathered all necessary equipment including lunch from the cook house, fire packs, climbing spurs, saws, burlaps, suits, chutes, etc. We didn't put on our suits until the plane was on the field.

As soon as the ship arrived at the airport each man took an assigned job. One put the aerial on the plane, one put on the steps, others helped Rufus and me into our suits, while others were loading the material into the plane.

We were soon ready to take off for the location of the fire. Pilot Dick Johnson, Merle Lundrigan, Rufus Robinson and I left the airport at 3:21 $\frac{1}{2}$ p.m. We went up river to Ditch Creek, swung around south of Wiles Peak to the designated location of the fire which was in the head of Martin Creek, Section 35, Township 31 North, Range 11 East, on the Nezperce Forest.

Rufus knew the country so he chose to go out first, consequently I was the second man out. Rufus threw the burlap out directly over a small alder patch about 300 yards from the fire on the uphill side. The burlap evidently hit two distinct currents of wind and was carried approximately one mile down the canyon from the spot. Dick circled the plane around the fire and Rufus made the correction for the burlap and informed Dick as to where he wished to make the jump. I believe Rufus was about 2200 feet above the timber when he took off. He made an excellent take-off from the ship but ran into more drift than was expected and was carried beyond the spot a quarter mile or so. Rufus landed on the edge of a small clearing in a small tree.

As soon as I noticed Rufus standing on the ground by his chute, I decided to spot myself and bail out. At this point I should have thrown another burlap because I could not see exactly where Rufus was when he took off. To the contrary, I only roughly guessed allowing a little more for the drift. We hit two very bad air pockets before I was in position to jump, and I do not believe we were much over 1800 feet above the timber, nevertheless I was anxious to leave ship and get into action. At 4:01 I bailed out and jerked my rip cord when I was clear of the plane.

I didn't make such a good take-off because I was beginning to turn over in the air when the chute opened. I think I received the hardest opening shock of any previous jump I had made. My risers were twisted above my head and it seemed some time before they started to unwind; but eventually they did unwind and I located my position in reference to landing.

I had drifted west of the spot, but was evidently coming down in line north and south. A stiff ground current caught me about 500 or 600 feet above the timber. I knew it was impossible to hit the spot under these conditions so I just turned my chute toward the fire and got well in mind my directions and plans before I hit the timber. It seemed to me that I was traveling about 15 miles per hour when I went over the timber below me.

When I was about down, I could see that I was going to land in large timber by a small creek. I picked a large spruce tree about 120 feet high. The chute hung on the limbs about 10 feet from the top on the southeast side of the trees. I went through the branches on the side of the tree, breaking many of them. I noticed the chute on the side of the tree and didn't want to swing back because I thought there might be a possibility of the chute slipping off the limbs and going on down to the ground, so I grabbed the stub of a broken limb and climbed onto the trunk of the tree. I just climbed up the tree a few feet and unwrapped my risers from the harness.

Fortunately, the tree was easy to climb down and I did not need my rope to descend to the ground where I took off my suit and set up my radio. Due to some unknown condition I could not get a very good reception from the plane, but was able to contact Merle a time or two. Merle didn't get to tell me where he was going to drop our packs, but I kept watching every time the plane came within dropping distance from me. I caught a glimpse of the first fire pack through the timber but only knew the direction and approximate distance to the fire pack. The second pack was released from the plane almost directly over my head and came in about 100 feet from me. I took the latter pack, filled my water bag and canteen, put the burlap with my suit and equipment, and started for the fire which was about a quarter or half mile east from where I landed.

I was about 200 yards from the fire when I met Rufus. We took the one fire pack and went down to the fire. The fire was burning very slowly and only had a few hot spots that could have been very dangerous. Rufus started around one side and I the other. We cooled down the hot spots, and trenched where they were the worst. We found a lot of dead line that we passed up.

About 8:30 I decided to go back to my chute and look for the other fire pack. I was following the small creek back when I heard a horse bell so obviously I went to see where they were. About 400 yards above my chute on the same creek I found a camp with four men. After a short conversation with them they informed me that they would be down on

the fire early in the morning. Rufus and I worked the hot spots that night and until 10:00 o'clock the next day when these men arrived. Rufus and I had practically trenched the whole fire, which was about three acres, scattered over about five acres of ground.

We ate a lunch that these men brought down to us and were ready to turn the fire over to them about 10:00 o'clock. I remained on the fire while Rufus went up and set out a manta and streamer to locate the position for the plane which had been ordered to drop supplies and pumps. The plane did not come when we expected it so Rufus and I decided to retrieve our chutes from the trees and get them in camp ready to pack the next morning.

We took a mule and went after Rufus' chute first. We had to cut the tree down to get the chute because it was draped over the top of the tree. A small hole was torn in the apex of the chute. After returning to camp with Rufus' chute, we started to where my chute was hung in the trees. I followed, with the mule, the same trail back to the place where the maintenance crew was camped the night before. I knew exactly where the chute was from this point. I followed the small creek down to where I had blazed a couple of trees on the creek bank. The chute was only about 150 feet from this place.

The retrieving of the chute was apparently a big job since it was a good 85 or 90 feet up the tree to where the risers were attached. I took my 100-foot rope and climbed the tree. Rufus tied the Pulaski on the end of the rope. When I got up the tree to my chute, I pulled it up to me in this order. I tied one end to my risers and threw the other end down to Rufus. When Rufus got the rope he pulled on it and I chopped the limbs off in which my chute was tangled.

Rufus and I were both surprised at the ease with which we took the chute out of the tree. We spent a short time looking for the other tools which we were not sure had been dropped. I eventually came to the conclusion that the tools, which consisted of spurs and saw, had not been dropped. Due to the fact that the trail crew had found our other fire pack when they came down to the fire, we were relieved of our search for this pack.

We got back to camp with my chute about 6:30 or 7:00 p.m. By the time we ate supper it was nearly dark and we retired for the night. I dressed in my jumping suit and pulled a manta over me.

The next morning Rufus, the packer Howard Engle and I started out for Moose Creek. We went down Martin Creek and cut across country to Moose Ridge. Rufus took a different trail and went on into Moose Creek. Howard and I went to Tony Point that evening. The next afternoon I brought the chutes down with a mule and horse that had been brought up from the station. At 4:00 p.m. July 15, I arrived back at the Moose Creek ranger station.

TYPICAL DESCRIPTION OF AN ACTUAL FIRE JUMP

By

James Waite

On July 24 at 1:30 p.m., Jim Alexander and I left Moose Creek field for a fire on Lizzard Creek, Lochsa District, Clearwater National Forest. Using the red Travelair plane, we arrived over the fire at 2:50 p.m.

After locating a likely looking spot to which to jump, I tossed out a burlap. It drifted far down the canyon, so on the next approach I tossed out another. It landed right in the spot which was about a mile from the fire.

On the next approach I bailed out. The wind was very hot and gusty and full of cross currents that day, and the air was the worst I have ever jumped in. I cracked the 'chute soon after leaving the ship and received a very light opening shock. I inspected the canopy for rips and then started for the spot. A cross current caught me and whipped me across the canyon. I had just worked my way back when another one caught me and took me across again. I worked my way back again and was above the spot, facing into the wind and coming down in good shape.

When I was about 100 feet above the tree tops and right over the spot, a sudden gust of wind sent me beyond and down the canyon. I was facing into the wind and therefore traveling backwards. I grabbed the guide line to turn myself around to see where I was going and saw a spike-topped snag looming up in front of me. I pulled down hard on the left front riser and slid between it and another one and lit over 125 feet up in a green spruce tree. I pulled myself in to the trunk of the tree and using my short rope, unsnapped the chute from the harness. I unintentionally dropped the longer rope so I got out of the suit and harness while in the tree and slid down, putting the radio inside my shirt and bringing it down with me.

At 4:00 p.m. I had the radio set up but could not talk to the ship as it is not bonded, but I could hear the ship's operator clearly. I then heard Jim yell so I knew he had made it all right although I had not seen him leave the ship or descend.

We signaled okay to the plane with our orange streamers, then left for the fire - picked up our fire packs which had lit about half way between us and the fire. I had jumped right over the fire and landed over a mile down the canyon.

We arrived at the fire at 5:55 p.m. There was one man on it before we got there and five others arrived just as we did. They had been searching for it since the night before, but could not find it. So our jumping

served another purpose - that of directing the ground crew to the fire. They saw us bail out and came immediately to where we were. The fire was about two and one-half acres when we reached it. By ten o'clock that night we had it trenched and under control.

Twenty-six more men arrived the next evening.

The following morning Jim and I were released. We arrived at Moose Creek at 3:00 p.m. the following day, July 27.

SUMMARY OF THE ADMINISTRATIVE OFFICERS' VIEW OF THE PROJECT

By George Case

The things that seem most desirable to overcome in the event that jumping crews are maintained another year are as follows:

1. Hold one plane always available for jumping, preferably at a field where jumpers are stationed.
2. Have extra gasoline storage at all fields where jumpers are stationed.
3. Check all jumpers for basic smokechaser training as well as jumping training.
4. Make a jumper of project leader for each jumping crew.
5. Be sure manual work is used at all jumping stations to provide hardening work for keeping jumpers fit.
6. Establish a curfew rule when jumping crews are in town.
7. Establish a pay differential between the project leader and the rest of the crew. Suggested rates, project leader or rigger \$2300; base jumper \$2,000.
8. Place paper sleeping bags in smokechaser packs for jumpers.
9. Set up sufficient funds so that jumpers can be kept at centralized landing fields, preferably six to eight men in a crew.

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TABLE COMPARING PARACHUTE AND GROUND CREWS

Suppression Time and Costs

Name of Fire	No. para-chuters used	Travel time lending field to fire - hrs. min.		Estimated travel time ground crew to fire (hours)	Cost via para- chuters	Estimated cost via ground crew
Martin Creek	2		40	24	\$ 190	\$ 500
Robbins Creek	2		50	24	350	10,000
Cox Creek	2	*6	30	30	150	20
Monte Creek	2	2	30	12	150	200
Elbow Creek	2	*13	10	25	150	50
Lizzard Creek	2	1	15	30	300	300
Smokejumper	2		30	40	190	10,000
Scout Mtn.	2	2	18	40	190	10,000
Isaac Creek	3	3	15	30	550	1,200
Average	2.1	1	37	28	\$ 247	\$ 3,500

*Excluded from average because of special conditions.

The total cost of the Region One parachute project for the year including personnel, depreciation on equipment and flying was \$9,047. The savings are appreciable when this item is compared to the \$32,270 estimated cost of control if parachutists had not been used.

ADMINISTRATIVE PLANS FOR 1941

With Missoula being the base of air transportation for the region, most of the smoke jumping activity should be carried on from here. It is my suggestion that two crews of ten men each be located at Missoula, one crew at Moose Creek landing field, one at the Cayuse landing field on the Clearwater Forest, and one at Big Prairie on the Flathead. (Instead of two crews at Missoula, may put one crew farther west, as for example, on the Kaniksu. This crew might use a Spokane airplane.)

The Missoula crews would be first line defense if the transportation happens to be at Missoula at the time. This would help from the standpoint of air travel cost. The other crews would be used for follow-up or for first call if the plane were in the vicinity of their landing field at the time the fire or fires were reported.

The project will be lined up as to classification - staff assistant-leader, one chief foreman of squads, one instructor-rigger, five squad leaders, five smoke jumper-riggers, and 40 smokejumpers. Their responsibilities and duties follow.

Project Leader

The chief foreman of squads is responsible to the regional Fire Control office staff assistant and is in direct charge of the project, and will be accountable for the equipment necessary for the operation of the project. He must also see that all other equipment which is on hand is made ready and is in shape for use.

The notification of the personnel and assembling for preparation of training the prospective smokejumpers.

The supervision, welfare, training and results of the smokejumping unit.

Checking the airplane to see that all necessary safety devices such as hand-holds, steps and seats are in place and of the right type. In case any or all of these devices are wanting, the project leader makes arrangements to have them placed on or in the plane.

The physical condition of the smokejumpers throughout the training and fire season. Calisthenics should be given daily to insure this physical condition.

Checking of the training given to the trainees by the instructors, and arrange for any follow-up training that is deemed necessary.

Equipment - to see that all equipment is kept in readiness or put in such condition as soon as possible. See that all parachute equipment

is repaired as quickly as possible when damaged. To check radios, batteries and tools so they are ready for immediate use. To see that each jumper's equipment is kept in readiness for call at any time.

Make schedules for the jumping. This will be posted and will show the jumping sequence with job assignment for the rest of the crew to insure a rapid get-away with no mistakes.

Make up maps and copies of the lookout reports on each of the fires on which smokejumpers are to be used. The maps must show the location of the fire, backsight readings to the lookouts, and the trails to be used for coming out from the fires. Should also find out about getting smoke-jumping equipment packed out and follow-up crews if needed.

Dispatching the smokejumpers to the fires. Accompanying the smokejumpers to the fires to locate the right fire, drop the tools to the jumpers, contact the jumpers, receive their report and return to the base. He should make a brief report to the district ranger on the success of the jumping, condition of the fire, and the general situation.

Under the plan in Region One, of 50 smokejumpers, the project leader will be stationed at Missoula and will assign his duties to the squad leaders on the crews at the Cayuse, Big Prairie and Moose Creek landing fields. He will check with these crews and work with them at their station during the season as much time as can be arranged.

Supplies, such as bed rolls and extra rations, being in readiness to be dropped to crews when needed.

Contributed work of the smokejumping crew. In cooperation with the district ranger, work plans and projects should be set up for the project crews.

Records of jumps, financial records, reports, monthly time and expense accounts, etc.

Instructor-Rigger

He is responsible for the training of the new trainees in parachute jumping, let-down and retrieving the parachutes, to make them expert smokejumpers. The training program is to be followed to the "T". He is to see that the chutes, suits, and other equipment used in jumping are suitable and up to standard. It is his responsibility to see that the training is started as soon as the trainee personnel is on hand. He is to see that his assistants know what is required of them as such and delegate the training work to them.

(Due to the short time proposed for this job, the instructor-rigger should probably be on the job a week or so ahead of the time to start training.)

Jumper-Rigger

Is responsible for supervising and packing and repair of all chutes. He will be responsible for making any changes and repair work necessary on the parachutes and other equipment on hand. It will be his job to carry on with the training of the trainees in absence of the instructor-rigger. He must have all equipment in readiness at all times or as soon as possible after use. He must train other smokejumpers to qualify as riggers. He may be called upon at times to make demonstration jumps or to jump on fires.

Smokejumpers are responsible primarily as firemen. They are to put out the fire that they jump to as soon as possible. They must see that their individual equipment is taken to the airport as soon as a call comes in for smokejumpers. They will be assigned other work when not on fire call by the project leader, or squad leader. They must put forth every effort to do their best at all times.

District Rangers

Are responsible for calling for the smokejumpers and furnishing the data needed for dispatching.

In dispatching smokejumpers to a fire, the district ranger should make the decision as to whether the fire is a smokejumper fire. He should then call for the plane and jumpers. The data for the maps and lookout reports should then be sent to the project leader or squad leader through the Fire Office.

Squad Leader

He should be a first-class smokejumper and understand the policies of the Forest Service in regard to fire suppression. He should have the qualities of a first-class fire foreman and be very responsible on the job. He will act in the capacity of the project leader at times as the project leader sees fit. He should be thoroughly familiar with the project leader's job.

Training

It would be my suggestion for Region One and Region Six to hold their training together. To pool their equipment and trained personnel at Missoula. This would be much cheaper for Region Six from a standpoint of airplane hire. Also one instructor-rigger could handle the job at one time and all personnel would be trained at one time rather than string the training out over two separate periods. Region One would profit by having the use of Region Six' trained riggers and their project leader.

TRAINING PROGRAM FOR 1941

FIFTY MEN USING STATIC LINE CHUTES

From 100 men, 50 will be chosen as trainees for smokejumpers. We will estimate a 10 percent loss through physical default. Using nine instructors or lead men, this will give each lead man 10 men, which is about all he can handle.

First Step

All instructors should be assembled prior to the start of training and given training plan set-up. They themselves should go through this training plan in brief (including at least one jump on static line chute). Five of these instructors should have rigger's license. Each one of the five would be in charge of a unit of 10 men throughout the season.

Training Program

This training plan shall comprise setting-up and tumbling exercises; let-down technique from different hanging positions; how to roll up canopy, chain lines, and general care of a chute; methods of retrieving canopies from trees and brush.

This ground training should be given by each instructor to his own group. All groups should be assembled on a large, open field.

A large, flat basin surrounded by timber-covered slopes would be ideal. Sleaman Creek might be just the spot. If this place were used, packing tables and ground training equipment could be set up and used. When trainees were ready to jump, they could be transported by truck to the airport, and take off from there in full jumping gear. It would only take about ten minutes to fly to Sleaman Creek, and as the ship would require a certain amount of time to gain altitude regardless of where the jumping took place, very little time would be lost.

Training Equipment

Two low training platforms.

These platforms should be six feet high, and have a door frame resembling and identical in dimensions to (1) a Ford trimotor, and (2) a Travelair 6,000. Steps should go up the back side for mounting platform. Trainees should practice jumping through these doors in full dress, using harness with static line in place. A place on which to snap static line should be mounted on door frame, thus simulating an actual jump.

Two training platforms 18 feet high built exactly like the lower ones.

These two platforms should be built close to each other in order that one instructor may split up his group and have half of the group training on each one. A one-inch rope should be suspended from a block located 30 feet above the ground and hanging right in front of the door on the platform. Free end of rope should have a ring attached, which in turn is held by a clip to the door frame. Trainee wears regulation harness to which special risers with spreader bar is snapped to harness in customary manner, at shoulders. Attached to spreader bar is one-inch rope with snap on end. Trainee climbs to platform, takes snap in hand, which is to simulate static line, snaps it into ring of rope which is held to door frame by clip, and jumps.

Sufficient spring is obtained from long rope, the other end of said rope being tied securely to base of tree from which block is suspended, to reduce jar of coming up short to less than that received from a normal opening. The jar of coming against the end of a rope arranged in this manner after an eight-foot drop is about the same as that of a jumper coming into and hanging in a tree. Thus the trainee experiences the similarity of opening shock and of tree landing - now he can use let-down rope and descend as though from a tree landing.

Four ropes should be suspended through blocks which are mounted at least 45 feet high. These ropes should be located in pairs or two together, in order that one instructor may divide his group. These ropes will be used in primary let-down training, as the height of the trainee may be varied, until he is eventually pulled clear to the top.

With this set-up of training equipment being used in the described manner, five instructors handling up to 50 men will be instructing and drilling at one time. The remaining four instructors can be putting the men through setting-up exercises, tumbling, dressing in suits, care of equipment, handling of chute on the ground and in the air, etc.

A method of rotating the entire class on one-fourth day schedule could be used. This would keep them from becoming too tired of one thing.

As soon as the actual jumping starts, which should follow after about three days' ground training, groups of seven men may be taken to the airport, since this is the probable number that can be hauled in a Ford trimotor. They will be flown to the training field for jumping. Two instructors should accompany each load. One is to act as flight leader - that is, do the spotting and see that each man gets his static line fastened before he leaves and retrieve line and rip cord. The other is to keep a tally or scoreboard on each trainee for reaction, etc. Tally sheet on each man to be used throughout the training.

Three men can probably be jumped at each pass of the field. Those on the ground will assist in rolling up chutes, seven men being previously

appointed to assist the seven jumpers. Each man should wear a number so that he may be easily distinguished, and be responsible for his equipment.

First jump	-----	1500 feet)	
Second "	-----	1500 feet)	open field
Third "	-----	1000 feet)	
Fourth "	-----	1000 feet)	hillside reproduction
Fifth "	-----	1000 feet)	second growth

These elevations will have to have the sanction of the Aeronautical Division of the Department of Commerce.

Packing Equipment and Personnel

At least five packing tables. Tables should be constructed to knock down in order that they may be transported by plane to forests where smoke jumping units will be located.

Five riggers will be required for repacking. Each rigger should have a man to help him, probably selecting one of the trainees. These men will have to be hired.

Owing to the small amount of training and experience acquired in Region Six this summer by F. Lufkin, G. Hovey and B. Derry, these three men should be alternated, one at a time, as spotters in trainee jump flights, with an experienced man checking on them and keeping trainees' records.

About 10 percent estimated loss by culling in ground training leaves 80 men.

About 15 percent estimated loss after first jump leaves 62 men. Balance of surplus to be eliminated on following jumps.

Cost of flying time estimated on preceding basis of elimination, which is only estimated.

First Jump for 80 Men

11 trips with Ford trimotor, 7 men per trip of	
40 minutes, 7-1/3 hrs. @ \$75 per hr. -----	\$ 550.00
1 trip with Travelair, 3 men, 40 min. -----	20.00
Cost for one jump (80 men) -----	\$570.00

Second Jump for 62 Men

9 trips with Ford trimotor, 7 men per trip of	
40 min. - 6 hrs. @ \$75 per hr. -----	450.00

Balance Forward \$1,020.00

An Average of 56 Men on the Remaining Three Jumps

24 trips with Ford trimotor, 7 men per trip
of 40 minutes - 16 hours at \$75 per hour - 1,200.00

TOTAL COST Flying Time ----- \$2,220.00

Cost of flying time for one man of 50 is \$44.40 or \$8.88 per jump.

Equipment to be Purchased

Parachutes - for one unit of 10 men f.o.b. factory. (To comply
with bid number 633. Manual rip cord or static
control rip cord alternate.)

11 complete training outfits @ \$338 each ---- \$3,718.00
1 back pack 30-ft. static line operated (est) 200.00
1 30-ft. spare canopy (estimated)----- 180.00
1 spare back pack container for static line " 15.00
1 spare chest pack " revised type " 12.75
\$4,125.75

TOTAL COST of five units 10-men each --- \$20,628.75

Clothing - for one unit of 10 men

11 suits (see bid 632, 5/13/40) @ \$40 each -- \$ 440.00
(a) tackle twill suit
(b) 8 oz. O.D. suit
(c) 8 oz. white suit

TOTAL COST of five units of 10-men each- \$2,200.00

Ankle Braces - one unit of 10 men

12 ankle braces (see bid 659, 5/15/40) @ \$1.25 ea. 15.00
12 back braces " " " " @ 4.00 " 48.00
\$63.00

TOTAL COST of five units, 10-men 315.00

50 helmets (see bid 658, 5/14/50) @ \$3.96 ea. \$ 198.00
50 face masks (estimated) @ \$1.50 each ----- 75.00
273.00

TOTAL EQUIPMENT TO BE PURCHASED ----- \$23,416.75

Equipment complete with spare parts for 50 men. This does not
include loft equipment for small or emergency repairs.

Administrative - Wages for Two Weeks' Training

Instructor-Rigger @ \$3800 per year:
Wage - 14 days ----- \$147.70
Subsistence, 14 days @ .90 ----- 12.60
Per diem, 10 days @ .76 ----- 7.60 \$167.90

Project Leader @ \$2600 per year:
Wage - 14 days ----- 101.08
Subsistence, 14 days @ .90 ----- 12.60
Per diem, 10 days @ .76----- 7.60 \$121.28

Nine Instructors @ \$2300 per year:
Wage, one instructor 14 days ----- 89.32
Subsistence " 14 days @ .90 --- 12.60
Per diem " 10 " .76 --- 7.60
\$109.52 each

Nine instructors @ \$109.52 each \$985.68

Fifty men @ \$2300 per year:
Wage, for one man - 14 days ----- \$ 89.32
Subsistence 1 man - 14 days ----- 12.60
Per diem 1 man - 10 days @ .76 ---- 7.60
\$109.52 each

50 men @ \$109.52 each -- ----- \$5,476.00

Five Parachute Riggers @ \$2300 per year: (10 days each)
Wage for one rigger - 10 days ----- 63.80
Subsistence " - 10 " @ .90 ---- 9.00
Per diem " - 10 " @ .76 ---- 7.60
\$80.48 each

5 riggers @ \$80.48 each ----- \$402.40

Fifty men @ \$1620 per year: (7 days each)
Wage, one man, 7 days ----- \$31.50
Subsistence, one man-7 days @ .90----- 6.30
Per diem, one man 7 days @ .76 ----- 5.32
\$43.12

50 men @ 43.12 each \$2,156.00

TRAVEL EXPENSES

109 men - 100 miles @ 2-3/4 cents per mile - \$299.75
50 men @ \$2300 per year, 2-day wage - travel 638.00
50 men @ \$1620 " " " " " " 450.00
5 men @ \$2300 " " 4- " travel time 127.60
5 men - 1000 miles each @ 2-3/4 cents a mile 137.50 \$1,652.85

Flying time

\$2,220.00

TOTAL COST OF TRAINING -

\$13,182.11

OUTLINE FOR 1941

One of the five units should be centrally located, preferably in Missoula. The rigger of this unit should be qualified to make major repairs on all parts of a parachute. This rigger would be able to act as an assistant to the instructor-rigger should the occasion arise. He in turn would have a member of his crew qualified to pack and help repair chutes. This unit would be equipped with machines to make any type of repair and would act as a hub to the other units. It would do all of the major repair work and keep most of the spare parts, such as harnesses.

The machine equipment for this unit's loft would be:

- 1 Sewing machine, double needle, class 32 model
- 1 Domestic type with reverse feed
- 1 Zig-zag machine
- 1 Harness machine

The other four units would need only one domestic type machine with reverse, as they would send all of their major repair and heavy work to the equipped unit.

TRAINING PROGRAM FOR 1941

Fifty Men Using Static Line Chutes

To put the training program into effect the following plan is submitted.

Place of Training

After April 15 there will be accommodations at the old CCC camp at the Remount. The smokejumpers will need housing facilities to accommodate about 75 men. This would be two bunk houses, one mess hall and one barrack that would be used for packing tables and to store equipment. All needs for the training such as a landing field, area for timber jumps, area for open meadow jumps for first-timers, and fire training can be had within a distance of seven miles of the old CCC camp. Under this plan all trainees and trainers will be assembled at one place and the men would not be scattered. Also, men coming on the job in the spring are sometimes not in a position to pay for hotel and meals.

Landing Field

On January 22, Mr. T. H. Richardson of Huson, Montana, was contacted in regard to using part of his land as a landing field. This landing field is located in the SE $\frac{1}{4}$, Section 14, Township 15 North, Range 22 West. Part of the above described land is owned by the State of Montana under lease to Mr. Richardson. He has verbally agreed to let the Forest Service use the land as a landing field with a small charge to the Service. This agreement should be put in writing before any use or expense is put on the field.

It is estimated that it would take about five days' work with a trail builder and a motor patrol to put this field in usable condition. The necessary labor and equipment to do the job can be arranged with the Nine Mile CCC camp. The field is mostly covered with small rotten stumps. Some of it has been cleared and broken for agricultural purposes. The land is quite smooth except for a few stump holes, some scattered, low brush and poles. The soil seems to be mostly gravel and can be worked at no additional expense as soon as the snow melts, which would be by the middle of April.

Mess and Equipment

Arrangements for a cook will have to be made. Mess equipment can be secured through the Procurement and Supply Department. All kitchen help outside of the cook can be obtained from the Nine Mile CCC camp.

Time of Training

All training should be completed by the 20th of June. Everything should be lined out to go by May 15.

TRAINING PLAN FOR 1941 (FIRE SUPPRESSION)

It is understood that all smokejumpers will have at least two years' experience as a fire guard and be qualified as same. It would be my idea then to give all smokejumpers a review on the training of new men and a complete course in advanced training in fire suppression. These men will be experienced in fire behavior of a certain kind of fuels with which they have had experience on the ranger districts from which they came. It will be the purpose of this advanced training to acquaint the smokejumpers with all types of fuels, so that they will all have at least a working knowledge of any fuel condition they may encounter in regional operation.

The training will possibly be handled by the project leader, training his assistants or squad leaders who will in turn train their squads under the supervision of the project leader. This training should proceed right after the smokejumping training is completed.

It will possibly take about ten days to complete this training and money should be set up for it.

The following is a tentative plan for training.

1. Fire suppression (fire guard training outline 1941)
 - a. Travel to fires
 1. Safety.
 2. Observation en route to fires.
 3. Use backsights on lookouts.
 - b. Meaning of terms and expressions used, such as control, mop-up, duff fires, ground fires, etc.
 - c. Actual suppression technique on small fires.
 1. Use actual demonstration fires to illustrate teaching points.
 2. Use of dirt.
 3. Use of water.
 4. Robbing of fuels.
 5. Trenching.
 - d. Control
 1. Define and explain the 10:00 a.m. policy.
 2. Advantage of early control. Weather and time of day have marked influence on rate of spread.
 3. Watch for spot fires near main fire. How done.
 4. Trench around all snags inside fire that are not burning.
 - e. Mopping up.
 1. Technique.

- f. No two fires are alike nor will the same suppression tactics apply on any two or three fires. Use all tactics taught and invent some individual plans to suit the particular situation. (Do something.)
 - g. Final check before leaving fire.
 - h. Take up action on freak fires such as fires in swamps, rock slides, etc.
 - i. Action upon returning to station.
 - j. What to do in case fire is too large to handle or gets away while working on it.
2. Map work
- a. Purpose of map.
 - b. Things we should know about the map.
 - Compass - care
 - use
 - Protractor
3. Pacing
- a. Knowledge of pacing is an asset to a good woodsman.
 - b. How to become efficient.
4. Area Computation
- a. Method of computing areas.
5. Attack by fireman (Fireman's Guide).
6. Behavior of fire.
7. Clean-up, inside fire line.
8. Diary.
9. Elements of fire behavior.
10. Equipment, fireman care.
11. Estimating fire behavior.
12. Estimating size of fires.
13. Fireman's fire report.
14. Fireman's knowledge required.

15. All steps in first attack.
16. All items under fuels.
17. All items under line construction.
18. All items under methods.
19. All items under mop-up.
20. Objective - suppression.
21. All items under tactics.
22. Topography.
23. Weather and wind.

SMOKEJUMPERS' JOB DESCRIPTIONS AND CLASSIFICATION

Title of Classification

Parachute instructor-rigger, CAF-11, \$3800.

Duties and Responsibilities

Under general supervision of the regional officer in charge of fire control or his designated representative, with responsibility for results and with considerable latitude for independent planning or laying out working details, to serve as training officer and instructor for smokejumpers and parachute riggers in the performance of the following duties:

To develop and prepare training programs, to instruct and train groups of smokejumpers in the essentials of parachute jumping over rough forest terrain, to supervise the training of the same, to make parachute jumps in forest terrain to demonstrate how it should be done and to train smokejumpers to qualify as licensed riggers.

To supervise, train and work with parachute riggers engaged in repairing, testing and packing of parachutes and in the construction of replacement parts required in the fabrication of parachutes, such as harnesses, packs, rip cord handle pockets, rip cords, and rip cord housings.

To be responsible for the inspection of parachutes and parachute equipment for the purpose of determining their serviceability and to discover such conditions which make the parachutes or equipment defective; and to be responsible for the maintenance of parachutes under his care, to see that they are properly inspected and are for use according to specifications.

To be assigned to two or more national forest regions in the Northwest, with responsibility for the duties as outlined herein.

With full responsibility and without review by higher authority, to decide upon the necessary changes as a result of inspection, when certain vital parts shall be replaced and when the parachute is unsafe for use.

To determine and correct cause of parachute shortcomings, to make airplane flights for the purpose of testing parachutes and other equipment and to make parachute jumps as required.

To determine and make specifications for improvements when necessary of parachute jumper's clothing or equipment; or to be responsible for designing and testing improvements of parachutes, jumper's clothing and equipment.

Parachute instructor-rigger (continued)

Occasionally to prepare specifications of equipment to be manufactured under contract.

To perform other work assigned.

Education

High school.

Experience and Minimum Qualifications

Licensed C.A.A. parachute rigger. At least five years' progressive experience in work requiring a thorough knowledge of parachute design, construction, operation and maintenance, and in addition not less than two years' experience as a parachute rigger with not less than two seasons' experience as a parachute jumper in mountainous terrain. At least two years' experience in training parachute jumpers and parachute riggers. Familiarity with and experience in altering and maintaining smokejumpers' suits and equipment.

Thorough familiarity with and the degree of skill in operation of all types of power sewing machines used in the trade.

Ability to work from blueprints, drawings or written or oral instructions and to develop designs from rough sketches or oral instructions.

Ingenuity in devising ways and means to accomplish unusual or exceptionally difficult jobs.

Manual dexterity, supervisory ability, carefulness, initiative, resourcesfulness and dependableness.

Good physical condition and willingness to make airplane flights and/or make parachute jumps in connection with testing parachutes and other equipment.

Age

Male, not over 45 years of age.

Title of Classification

Chief foreman of parachute squads, SP-8, \$2,600.

Duties and Responsibilities

Under general supervision of officer in charge, with considerable latitude for independent planning or laying out working details, to serve as fire control training officer of parachute squads and as chief foreman in charge of from three to five squads, each of which will be in direct charge of a smokejumper squad leader.

To plan and carry out the intensive courses of training in all the advanced arts of fire fighting in the training of the individual smokejumpers and smokejumper squad leader to act most efficiently in their respective jobs in finding and successfully fighting the most difficult forest fires either as individuals, as single squads or as a fully coordinated team of several squads.

To train, supervise and inspect the functioning of the smokejumper squad leader in the keeping of records, preparing reports, to make arrangements for major repairs and replacements of equipment for the several squads who will be located at isolated mountain fields.

To supervise, inspect and dispatch from one to five squads by airplane to the points needed as required by the regional fire dispatcher or any of the several forest supervisors.

To prepare and handle personnel cases involving any of the squad personnel in the parachute project, making recommendations for action to the officer in charge.

To serve as liaison between the local responsible administrative officer upon whose district the parachute squad or several squads are engaged in fire suppression, to insure that proper follow-up is made and that return transportation by pack mule is provided at appropriate times and places to insure the quickest possible return of parachute equipment.

To make arrangements for the housing, training and care of the parachute personnel and equipment which is detailed to back country landing fields.

To lead and direct fire suppression forces in the suppression of difficult fires and to be in charge of from two to five parachute squads plus ground force workers up to 150 men, all engaged in the suppression of one or more fires in difficult back country terrain.

To call for and schedule delivery of the needed supplies and equipment by airplane and parachute for the equipping and maintaining of such forces.

Chief foreman (continued)

To make parachute jumps as a leader of several parachute squads up to the number of five and to take charge of them on the fire to which they are dispatched, prescribing tactics and methods.

To plan and lay out forest improvement work for from two to five squads which will insure the physical conditioning of the parachute jumping personnel during times when the parachute squads are not engaged in fire suppression.

To plan and lay out the working details of calisthenics and other physical exercises to provide the physical conditioning of the parachute jumpers.

Education

High school.

Experience and Minimum Qualifications

Familiarity with the construction, use and maintenance of smoke-jumper, parachute and fire fighting equipment.

At least five seasons' work in forest fire control in the training, supervising and inspection of skilled fire fighting personnel. A major portion of the experience involved in this must have been in the direction of crews of from 25 to 100 men in the suppression of forest fires.

Must have experience and familiarity during the required five seasons in the use of reports and procedures used in management of fire protection forces.

Must have leadership qualities with particular ability to maintain morale of workers engaged in difficult and dangerous work and at the same time be a successful disciplinarian to make certain that safety procedures are followed.

Must have manual dexterity, carefulness, initiative, resourcefulness, ingenuity and the utmost dependableness.

Age and Health

Male, 21 to 45 years of age.

Must be of sound physical and mental health. Must be able to pass physical examination equal to the Civil Aeronautics Authority pilot's (private) physical examination. The following factors will disqualify an applicant -- hernia, organic heart disease, or any other serious physical defect. Glasses cannot be worn while jumping with a parachute; therefore, the applicant must be able to see well without glasses.

Title of Classification

Smokejumper-rigger, SP-7, \$2300.

Duties and Responsibilities

Under direct supervision of officer in charge, with some latitude for independent planning or laying out working details, to do the necessary routine testing, inspecting, packing and repairing of parachute and other jumping equipment as follows:

To aid parachute instructor-rigger by instructing and training smokejumpers in jumping and rigging.

To inspect parachutes and other parachute equipment to determine serviceability; to repair or replace unserviceable parts such as panels, packs, shroud lines or harness; to manufacture all replacement and improvement parts; to pack all parachutes; and to do the necessary testing of repaired and altered parachutes or parachute equipment.

To inspect, repair and make necessary improvements of the smokejumpers' suits and equipment.

To make parachute jumps over forest terrain in training the smokejumpers, in making tests of equipment and on any other occasion when so requested by the supervising officer.

To perform any other manual labor, semi-skilled or skilled, or other work when so instructed by the supervising officer.

Education

High school.

Experience and Minimum Qualifications

Currently licensed C.A.A. parachute rigger, having made at least ten parachute jumps, of which at least two jumps must have been in mountainous forest terrain.

Familiarity with, and a degree of skill in operation of all types of power sewing machines used in the trade. Familiarity with the construction, use and maintenance of smokejumpers' suits and equipment.

Manual dexterity, carefulness, initiative, resourcefulness and dependableness.

Age and Health

Male, 21 to 35 years of age.

Smokejumper-rigger (continued)

Must be of sound physical and mental health and must be able to pass physical examination equal to the C.A.A. pilot's (private) physical examination.

Title of Classification

Smokejumper-squad leader, SP-7, \$2,300.

Duties and Responsibilities

Under sometimes direct, but usually general supervision of officer in charge, with considerable latitude for independent planning or laying out working details, to do the necessary routine testing and inspecting of jumping equipment.

To aid parachute instructor-rigger by instructing and training in jumping and other smokejumper duties.

To keep the records, time, expense and make arrangements for repair and replacement of equipment for his squad.

He must be able to act in the capacity of the chief foreman and dispatch jumpers to fires on a small scale.

To make parachute jumps over forest terrain in training the smokejumpers, making tests of equipment, to make jumps in connection with actual suppression of fires and on any other occasion when so requested by the supervising officer.

To perform skilled manual labor in the suppression of fires or other work when so instructed by the supervising officer.

To lead, direct and supervise a squad of five to eight smokejumpers in the suppression of fires to which his squad has been dispatched; to determine tactics and methods of control on unusually difficult fires in inaccessible areas requiring from 5 to 25 men to control.

To take charge of small groups of fire fighters who arrive by ground travel on the fires to which he and his squad have been dispatched.

Education

High school.

Experience and Minimum Qualifications

Familiarity with the construction, use and maintenance of smokejumpers' suits and equipment.

Must have at least five seasons' experience smokechasing and handling of fire crews in the capacity of fire foreman on a fire forest.

Manual dexterity, carefulness, initiative, resourcefulness and dependableness. He must have leadership abilities with which to build confidence of those under his direction.

Age and Health

Male, 21 to 37 years of age.

Must be of sound, physical and mental health. Must be able to pass a physical examination equal to the Civil Aeronautics Authority pilot's (private) physical examination. The following factors will disqualify an applicant - hernia, organic heart disease, or any other serious physical defect. Glasses cannot be worn while jumping in a parachute; therefore, the applicant must be able to see well without glasses.

Title of Classification

Smokejumper-fireman, SP-6, \$2,000.

Duties and Responsibilities

In accordance with the prescribed or standard methods, and under the direct supervision of a higher grade officer, with some latitude for independent or unreviewed action or decision, to perform duties in connection with fire protection as a parachute jumper, smokechaser and fire fighter as follows:

To serve as member of parachute jumping fire suppression squad or as an individual fireman with responsibility for alone suppressing difficult fires in mountainous country.

To gain knowledge of the best techniques of parachute jumping as instructed; to make practice parachute jumps; to jump over forest and mountainous terrain, landing in the timber or open, rough ground; to act as "smokechaser" using compass and map for cross-country travel and for orientation of location of parachute landing with that of the fire; to fight and put out fires; and to operate radio for communication.

To aid by keeping records, making reports and making suggestions for all phases of work assigned in connection with the parachute jumping, smokechasing and fire fighting work.

To perform assigned manual labor on road, trail or telephone line maintenance or construction or on other forest and range improvement work.

Education

High school.

Experience

Three seasons' of three months each, experience as a forest guard (lookout-fireman) which must have included a large proportion of fire suppression experience with a recognized forest fire protection agency.

Age and Weight Limits

21 to 35 years of age.

130 to 190 pounds.

Health

Must be of good health and general physical ability. Must be able to pass a physical examination equal to the Civil Aeronautics Authority pilot's (private) physical examination. The following factors will disqualify an applicant - hernia, organic heart disease, or any other serious

Smokejumper-fireman (continued)

physical defect. Glasses cannot be worn while jumping in a parachute; therefore, the applicant must be able to see well without glasses.

CODE OF CONDUCT

for

Smoke jumpers

1. Safety first. Take no chances - if not safe, do not jump.
2. Use no nerve stimulant.
 - (a) Keep a clear, cool head.
 - (b) No liquor will be used on the job or at any time while on fire call.
3. You are personally responsible for all equipment assigned to you.
4. See that all your equipment is serviceable and inspected by rigger. Never alter jumping equipment without approval of a licensed rigger or project leader who will contact a rigger for you.
5. Never jump with matches, or anything else in your pockets that will cause an injury. Put them in your smokechaser pack.
6. Care should be exercised in eating before jumping to avoid upset stomach.
7. Report all injuries and strains as soon as possible to your project leader.
8. Keep a complete diary as to time, place and any other happenings that one would want reference to, such as meals, lodging, and expense as well as to all parts of your work.
9. Curfew is 10:00 p.m. or earlier while on jumping duty, unless you are on fire duty. Eight hours sleep is the objective.
10. Be prepared but mentally and physically relaxed. Learn to go into action quickly. Minutes count!

Live by these rules if you want to do right by a job requiring more from men than most. You are invited to return to your previous job if you feel this code is too restrictive.