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THE FIRE FLY PROJECT

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PREFACE

I have written this treatise in an attempt to memorialize some of the work done by the 555th Parachute Infantry Battalion during World War II. This entire work generally is related to my personal experience gained in that unit on the Fire Fly Project. As a unit, the 555th Parachute Infantry Battalion was of little tactical significance, because during the period of World War II its assigned strength never exceeded an aggregate total of 319 men and officers, approximately 50% of that authorized by the Table of ~~Distribution~~ ORGANIZATION. War Department policies and priorities during 1943 and 1944 precluded an adequate flow of filler replacements to the organization, which was activated as a battalion in September 1944 from the 555th Parachute Infantry Company. The Fire Fly Project did not require capabilities in excess of those existant in the battalion, and it was well-suited for a mission such as this. The battalion left Camp Mackall, North Carolina on or about 8 May 1945 to join the units engaged in the joint Army, Forestry Service operation, arriving at Pendleton AAB, Oregon on or about 14 May 1945, remaining so engaged until on or about 21 October 1945.

Subsequent to the cessation of the war, and by August 1946 the battalion strength mushroomed to over 1400 men and officers, and has ever since remained extremely high, even to this day when that unit is designated as Third Battalion, 505th Parachute Infantry Regiment.

The Fire Fly Project was an obscure, unpublicized operation, but, at its inception was of grave importance to our national security. This fact, I hope, has been made evident in the treatise that follows.

ACKNOWLEDGMENTS

Without the timely cooperation and response to my requests by Mr. C. A. Gustafson, Chief of the Division of Fire Control, U. S. Forestry Service, Washington, D. C., and Mr. P. D. Hanson, Regional Forester, Missoula, Montana, my quest for background material would have been extremely unsuccessful.

Information provided by Major Richard W. Williams was of great benefit in the work on the training requirements met in the Fire Fly Project. Major Williams was Executive Officer of the 555th Parachute Infantry Battalion during the smoke jumping days and for sometime thereafter.

I wish to thank the library staff for the tireless assistance rendered to me in the efforts of "digging-up" material on a most obscure subject, militarily speaking. I stand ever appreciative of the extra time spent on the part of librarians, searching the voluminous files on my behalf.

SPURGEON A. MOORE
Captain Infantry

INTRODUCTION

The Army must stand ready to not only guard and defend the shores of the United States against the armed might of an aggressor, but, it must also be prepared and capable of performing certain domestic tasks as well. The scope of these housekeeping details ranges from the protection of public property and riot control to the relief of disaster in areas beset with severe floods, fires or other forms of natural hazard. In the expansive northwest sections of our country are vast timberlands with enormous stands of virgin timber. They are vital to our economic and industrial power, and consequently to our national security. The U. S. Forestry Service and the various State Forestry Departments have the immediate responsibility for the administration, security, and control of these vast tracts of timberland. The greatest enemy to their efforts is fire. Stress is placed on fire suppression and control in the daily routine of the forester, particularly during the critical burning periods from June to October.

The advent of a military menace, discovered in 1944, and the shortage of personnel available to the U. S. Forestry Service posed grave forebodings for the coming fire season in 1945. The Forestry Service was going to need assistance, unusual assistance, for now not only were fires to be fought, but a military instrument as well.

In this treatise we will discuss the role of the Army, in a combined effort with the Forestry Service, to develop the defense against the Japanese Balloon bombs; some aspects of jumping in close, mountainous terrain; and some backgroung on the Japanese Balloon bobms that assailed our west coast from November 1944 to July 1945, inclusive.

OPERATION FIRE FLY

THE NEED FOR CONCERN

In late 1944, U. S. Foresters in the northwest regions discovered that the forest ranges were under bombardment by incendiary and antipersonnel missiles, the origin of which was a mystery to them. These "missiles" were later found to be free-sailing, unmanned, paper balloons which carried a small bomb load. The incident that aroused the Forestry Service occurred near the town of Hayfork, California, when one of them exploded after landing in a tree, almost causing injury to Forestry personnel in the vicinity. About the same time, a complete unit was found intact in the Modoc Forest. This unit was turned over to Army intelligence, (1). As time went on, more and more units were located, and through analysis of the materiel a complete picture was developed on the origin, characteristics, functioning and capabilities of the balloon bombs. Analysis by Army Intelligence, Federal Bureau of Investigation and the Naval Research Laboratories determined the origin to be Japan. The intentions of the Japanese were not immediately evident; however they were at this time incapable of launching air attacks against us, (2). Any tactical value of the balloon attack was doubtful, yet despite the lack of Tactical value to this measure, lives and property were endangered. One woman and five children were killed in Oregon, when in curiosity one of the children molested an antipersonnel bomb on one of the mechanisms causing it to explode. It was evident that some action was necessary for handling these bombs when they landed, for sighting and destroying them if possible before they landed, and for the control or suppres-

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(1) Fire Control Notes, Forestry Service, U. S. Dept. Of Agriculture, p. 4.
(2) Coast Artillery Journal, March-April, 1946, p. 54.

sion of forest fires that would be caused by them. This coupled with the extreme shortage of forestry personnel due to the war, caused the marriage of the U. S. Forestry Service and the Army in an effort to cope with what might develop into a serious and costly situation.

ORGANIZATION

The U. S. Forestry Service and State and local forestry agencies are responsible for the control and prevention of forest fires. The increased "natural hazard" due to the appearance of the balloon bombs made special measures and additional fire fighting personnel to assist the Forestry Service necessary. Request was made to the Army by the Forestry Service for assistance in planning, manpower, supply and equipment to have trained forces prepared to control the fires that were anticipated in the approaching fire season of 1945. The responsibility of internal security as it pertained to fires stated by the balloon bombs was that of the Provost Marshal General, who was authorized by the War Department to coordinate forest fire matters. Through his close cooperation with the Forestry Service and Commanding General, Ninth Service Command, a flexible task organization was planned capable of meeting the expected emergency. The combined efforts of these agencies had the following results: (3)

1. Effected the assignment of the 555th Parachute Infantry Battalion, to Pendleton AAB, Oregon where the unit would receive training in smoke-jumping.

2. Secured the activation of the 3171st Engineer Fire Fighting Battalion, consisting of ten Fire-Fighting Companies. Each unit was to consist of four officers and 269 enlisted men.

3. Secured the First Troop Carrier Command based at Walla Walla, Washington and the 161st Liaison Squadron which were to furnish

(3) Tab "D", Appendix 3, Annex "G", HQ, Continental Air DEF CMD.

air support to transport the paratroopers on fire missions, fly resupply missions for the Forestry agencies, and locate Japanese balloon bombs while they were yet airborne.

The code name of this effort was the "Fire Fly Project", which was in effect an overall forest fire-fighting plan for the War Department.

The organization of the "Task Force" for the Fire Fly Project was obviously very flexible. All of the ground troops were able to cope with the fire-fighting aspects of the mission, to perform prescribed tasks on locating Japanese balloon bombs. The airborne element gave additional capabilities to the organization that were also of great value. The Rigger section of the battalion, a well-trained group of personnel, was of invaluable service in all efforts of parachute maintenance, packing and aerial resupply. A Medical Section which included two Medical officers, was organic to the battalion, and was ever ready to perform emergency, jump-rescue missions, as well as accompany each team of smoke-jumpers on fire missions. Of course, the battalions overall strength, added to the small Forestry force of smoke-jumpers (approximately 220 men in the entire northwest), increased the range and extent of fire missions that could be undertaken at one time, affording greater protection to life, and private property, as well as public property in that area.

The Air Force units assigned to this force were undoubtedly the key to success in combating balloon bombs and fire. They added mobility and speed, and extended the area of surveillance for the presence of balloons and fires.

However, the mere marry-up of the units for the project was not enough to assure accomplishment of the mission. Training was

necessary to develop the teamwork, particularly between the airborne and Air Force, without which no drop in the close mountainous terrain could possibly be successful. Plans were also necessary for the procurement of suitable equipment to be used by Army units for jumping in the mountain forests (4).

SMOKE-JUMPING

HISTORY

The idea of smoke-jumping was not born with the development of our fight against the Japanese Balloon bombs in the Fire Fly Project. The idea was evolved as far back as 1931 by a former U. S. Forester named T. V. Pearson. The first actual experiments in smoke jumping, however, were not attempted until 1939, when other type "airborne attacks" on fires had proved inadequate. The major problem that the Forestry Service was attempting to defeat was that of reducing "elapsed time". Elapsed time is that period from the report of a fire to the time an actual "attack" is made to extinguish it. The "final area" of a fire is proportionate to this "elapsed time", consequently, the earlier the arrival of fire fighting personnel to a fire, the less is the loss of timber and property. Thousands of acres of inaccessible timberland in the northwest, requiring hours or days to reach by foot or horseback, could be reached in a minimum of time by plane and parachute if someone jumped into them. The experiments in 1939 to determine the possibility of dropping men by parachute into the mountain forests were, and we know now, successful. This was indeed a laudable feat. The primary conclusion of the work that year was that men could be dropped from planes and land by parachute in the mountain areas without injury to themselves, and were able to fight fires after landing. Many considerations had led up to

(4) Letter, P. D. Hanson, Regional Forester, Region.

this final conclusion, but it was the real goal. The following year saw the first actual smoke-jumping operation, when on 12 July 1940 two smoke-jumpers were dropped on a fire in the Nezperce National Forest, and control was established in less than eighteen hours. A total of nine fire-jumps were made in 1940 with an estimated saving of over $23,000 from the use of smoke-jumpers instead of ground-crews on those fires alone. The success of these experiments were of interest not only to the Forest Service, but to the Army as well. According to the annals of the Forestry Service, the "Father of the U. S. Army Paratroopers", Major General William Cory Lee, visited the smoke-jumper training school at Missoula, Montana in June 1940 to observe the methods and technics employed there (6). Needless to say, we all know the final effect of General Lee's work as it affects Military parachuting in the U. S. Army.

DEVELOPMENT

The Forestry Service engaged Mr. Frank M. Derry to direct the experimental work in adapting parachuting to fire fighting. Mr. Derry, an associate of the Eagle Parachute Company, was a professional parachutist and rigger, but his efforts on this project were definitely those of the pioneer. No attempts at dropping by parachute into a mountain forest to fight a fire had ever been made before. The initial problems confronting him were generally these:

1. An "adequate protection for the jumper to land in timber or on steep slopes".

2. A means of "maneuvering the parachute as much as possible to avoid the worst obstacles to a successful jump".

3. A means of "enabling the jumper to extricate himself from the high trees".

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(6) History of Smoke Jumping, 1939-1949, DIV Fire Control, JSFS, p. 5.

4. The adaptation of "miscellaneous aircraft" not designed for parachuting, and the "development of a drop-technique".

5. The "design" of a "system of training jumpers and provide the means". (7)

These were the major problems to the actual jumping. There were others such as rigging and maintenance, too which were incidental to the entire operation. It might be added here that of those above the only problems that might not have been of immediate concern to the military parachutist in the early days are numbers one and three.

The problems were all resolved in turn through the experiments of the 1939 projects, and worthy of special note was the development of the Derry slotted parachute, designed by Mr. Frank M. Derry. This 'chute was used by the 555th Parachute Infantry Battalion on all its fire-jumps in 1945. The parachute initially used in the experiments in 1939 was the Eagle, 30' back-pack assembly with a 27' emergency chest pack This 'chute was replaced in 1942 by a 28' Irving type canopy, as used by the Army and modified by Mr. Derry to reduce oscillation and increase maneuverability by the addition of slots and guide lines (see APP II, Annex 13). The static line, which the smokejumpers did not begin to use until 1941, was also a component of this 'chute, The modifications listed above did somewhat change the performance of the chutes, as compared to the Army parachute assemblies of the same general dimensions. The principal difference was a reduced ability to "brake" the 'chute for a landing, due to the impossibility of closing the slots in any way. This resulted in a faster landing speed for the jumper with the Derry 'chute than with the Army T-7 canopy. The effect of oscillation has to be countered by the parachutist himself, anyway. Even with the slots, this remains so, and training is

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(7) Ibid., p. 3.

the greatest guard against inability to control oscillation. Having worked with this parachute assembly, as well as with the Army T-7 assembly and other military parachutes, the author feels that the Army T-7 is the best all around assembly and can be used in any type terrain with better all around performance.

In addition to the developments in parachute design Mr. Derry's work led to the production of suitable protective clothing for the smoke-jumpers; (see APP II, Annex 1-6) the development of let-down procedures for getting out of high trees; the adaptation of the Ford Tri-motor and Curtis Travelair planes for smoke-jumping; and, the development of a physical and technical training program for the instruction of the jumpers, a program similar to that adopted by the Army.

OPERATIONS MILITARY

The 555th Parachute Infantry Battalion was assigned the mission of jumping on forest fires and isolating the target areas of the balloon borne bombs in Washington, Oregon, Idaho, Montana and California. By the time the battalion entered the scene of smoke-jumping on the Fire Fly Project, the technics for smoke-jumping and the equipment necessary for that activity were very well stabilized by the Forestry Service. The personnel of the battalion were trained parachutists, however special training in the timber-jumping procedures, and the use of the fire fighting equipment was needed. It was also necessary to procure proper equipment for the unit to perform the mission of parachuting in the close, mountainous terrain of the northwest. (See APP II, Annex 10-12)

Training began at Pendleton, Oregon on 5 June 1945 under the supervision of senior Forestry personnel and Mr. Frank M. Derry, and continued until 20 July 1945. Instruction was conducted in small groups,

and although it was not complete until 20 July 1945, the first fire mission was jumped on 8 July 1945, by personnel who had finished the course of training. The training program was divided into four phases: (8)

1. Airborne Phase - The use of the Derry slotted chute, tree landings, and let-down procedures were taught in this phase, Each individual made several parade-ground jumps with the Derry 'chute, and then made three simulated fire drops in the mountain forests of Willowa National Forest, Oregon, 30 miles from the Pendleton AAB. The necessity for tree landings was emphasized in jump training, as it was the safest type to execute on the high, rock terrain of the mountains. Concurrent with this training, jumpmasters worked on "spot jumping" technics to be utilized in dropping the fire fighting teams on the mountain slopes. Skilled jumpmastering is of utmost importance, and the jumper's success depends greatly on the jumpmaster's ability to use drift 'chutes, his observation of the direction of smoke-drift, his observation of the terrain in selecting the "tap-out" spot, and his selection of the approach the plane will make on its "pay run". Unlike military parachuting where the pilot gives the signals, here the jumpmaster gives the pilot the signals.

2. Fire Suppression Phase - In this training the jumpers were taught by senior members of the Forestry Service methods and techniques as follows:

a. Use of forestry tools and equipment.

b. Technique of fire fighting, including the construction of fire-lanes; employment of fire-lanes; and, methods of backfiring.

c. Aerial resupply in mountainous terrain.

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(8) Notes, Maj R. W. Williams

This was indeed the back-breaking phase not only in training, but in actual fire fighting as well. Operations against forest fires are almost as highly organized as a military mission against an enemy. Forest supervisors study maps, make reconnaissance continually, and maintain close control over the fire fighting and control elements through a good communication net.

3. Woodcraft Phase - Woodcraft, or woodsmanship, was taught to enable the smoke-jumper to navigate and survive in the mountainous, remote areas that he would be in after a jump. Significance of the signs of nature, direction of drainage and flow of streams, and the use of the Forestry "blazed trails" were emphasized in this instruction. Here we became acquainted with the very accurate maps used by the Forestry Service. These maps utilize the early American grids of metes and bounds of the general Land Survey. The use of Forestry compasses, more accurate than those we normally use, allowing for setting off the declination conctant, was also introduced.

4. Japanese Balloon Bomb Orientation - Only an orientation on the description, characteristics and functioning of the assembly was given the battalion. Normally, disposal was the job of an Ordnance unit detailed from the Ninth Service Command. (See APP III, Annex 1-2)

One innovation in smoke-jumping was jumps in force performed by the Army paratroopers in the 555th Parachute Infantry Battalion. On one occasion almost one hundred men were dropped on a fire. This drop was the equivalent to a large-scale tactical maneuver. A total of 147,562 man-days of fire fighting, including 282 fires, were contributed by all the Army units. The smoke-jumpers worked 28 fires and completed 4,012 man-days of fire fighting. The Troop Carrier transported 2,313 personnel and dropped 178,974 pounds of supplies. The Liaison Squadron flew 3,905 hours on 1,978 sorties, and reported 145 fires and five balloon incidents. (9)

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(9) Ibid., (5) p. 7.

JAPANESE BALLOON BOMB

BACKGROUND

The discovery of the balloon bombs on our shores cause several questions to arise, the answers to which were to determine the methods and organization for defense against them. The important consideration was the Japanese purpose and intent in their use of the balloons. It was felt that they could continue to transport bombs, make ranging shots, transport biological warfare agents, and propagandize the effects to their people. Evidence substantiated all the uses except that of as a biological agent. Interrogation of high-ranking Japanese officers after the war indicated that the balloons were used as a retaliatory measure to the Doolittle bombing of Japan on 18 April 1942. It was further borne out that there was no intention to use them as biological warfare agents, (10). The effort to use them to bolster the morale of the Japanese people was evinced in a Domei broadcast, beamed in English to the U. S. on 17 February 1945, claiming "500 casualties. . .inflicted. . .numerous fires started. . .(U. S. Government) had issued general warnings against balloon attacks. . .aggravated unrest among the people", (11). Contrariwise, the actions of the U. S. and Canadian press and radio, at the request of the Army, constituted one of the greatest examples of the effect of voluntary censorship that occurred during the war. The Japanese were unable to learn anything of positive value on the effects of their efforts.

The Japanese began their work with balloons between 1932 and 1935, when they developed paper balloons for meteorlogical studies. The bomb bearing balloons evolved from these and were larger in size so

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(10) "A Report on Japanese Free Balloons", The Coast Artillery Journal, March-April 1946, p. 54.
(11) Intell. Bulletin, G-2, USAFPOA, 23 March 1945, p. 14.

that they could be capable of transoceanic flight. (See APP III) The production goal was 20,000 balloons of the larger size, which were to be released against the U. S. Only 9,000 of that number were manufactured and all of them were released by 20 April 1945, (12). These balloons traveled at speeds of 150 to 180 miles per hour, at altitudes from 30,000 to 40,000 feet with 33,000 being the average, and required from 80 to 120 hours to arrive on the North American continent, (13).

The launching sites for the balloons were located on the east coast of Honshu Island, as was determined by analysis of sand from the ballast of one of the assemblies, (14). Later, elements of the 1st Cavalry Division discovered extensive launching sites in Northern Ibaraki, Prefecture, Otsu, Japan, (15). The balloons were normally released in early morning, or early evening when the ground winds were low. The method of release depended on the wind velocity, and a crew of thirty men required about thirty minutes to complete launching, (16). It is estimated that each paper balloon cost approximately $2,300, (17), and the launching site at Otsu, Japan cost approximately $200,000,000 to construct, (18). For a tabulation of balloon incidents, see APP III, Annex 3.

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(12) Ibid., (10) pp. 54-56.
(13) Military Review, Dec. 1945, p. 81.
(14) Documentary (Film) Conference, Japanese Free Balloons, Military Intell Div, War Dept., 1 Aug 1945.
(15) Military Review, Oct. 1947, p. 66.
(16) Ibid., (10) p. 55.
(17) Ibid., (16) p. 55.
(18) Ibid., (15).

SUMMARY

The Fire Fly Project was the combined effort of the Army, The U. S. Forestry Service, and the technical and intelligence agencies allied to them, all bent toward combating a threat to our national security. Every operation of the project required close coordination and cooperation of the joint headquarters involved, and the success of these combined agencies should gain a place in the annals of both the Army and of the U. S. Forestry Service.

Some of the lessons learned as a result of this endeavor are as follows:

1. The Armed Forces and Civilian Agencies must stand ready to combine their efforts to protect our internal security, maintaining an expectant attitude of the necessity of such action, and activating a timely, flexible organization capable of coping with whatever contingency does arise.

2. The work of the U. S. Forestry Service has had marked influence on the concepts and techniques of training parachutists in the Army; this similiarity makes possible the training of military jumpers to drop in close, mountainous terrain with a minimum training effort.

3. Balloons can be produced that travel at stratospheric altitudes, at speeds approaching 200 miles per hour, for distances of 4,000 miles and arrive on the U. S. west coast in some numbers from February to July. These balloons could be used in biological warfare endeavors, if an enemy so desired.

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PERSONAL NOTES

Hanson, P. D., Regional Forester, Region 1., Missoula, Montana.

Williams, Richard, Major, Exec Off 555th Parachute Infantry Battalion, 1944-1946.

APPENDIX I

FIRE FLY PROJECT

TASK ORGANIZATION

Major Commands: Western Defense Command
Ninth Service Command
Fourth Air Force

- TROOP UNITS -

Air Force

First Troop Carrier Command
161st Liaison Squadron

Army

3171st Engr Fire Fighting Battalion (Prov)

3209th Engr Fire Fighting Co. (Prov) - Chico AAB, Calif.
3210th Engr Fire Fighting Co. (Prov) - Santa Rosa AAF, Calif.
3213th Engr Fire Fighting Co. (Prov) - Camp Haan, Calif.

3212th Engr Fire Fighting Co. (Prov) - Camp White, Ore.
3217th Engr Fire Fighting Co. (Prov) - Portland AAB, Ore.

3215th Engr Fire Fighting Co. (Prov) - Geiger Field, Wash.
3216th Engr Fire Fighting Co. (Prov) - Geiger Field, Wash.
3218th Engr Fire Fighting Co. (Prov) - Fort Lewis, Wash.

3214th Engr Fire Fighting Co. (Prov) - Fort Missoula, Mont.

3211th Engr Fire Fighting Co. (Prov) - Gowen Field, Idaho

555th Parachute Infantry Battalion - Pendleton AAB, Ore.

Chico Detachment, 555th Prcht Inf Bn - Chico AAB, Calif.

U. S. FORESTRY SERVICE

			Smoke-Jumpers
Region 1	Northern	Montana	153
Region 4	Intermountain	Idaho	36
Region 5		California	0
Region 6	North Pacific	Oregon/Washington	30

NOTE:

The smoke-jumpers of the Forestry Service were largely Civilian Public Service personnel, 4-E draftees (conscientious objectors).

APPENDIX II

SMOKE-JUMPING AND ALLIED EQUIPMENT

Description of protective equipment and smoke-jumper team fire fighting tools:

ANNEX 1:

Smoke-jumper helmet with mask attached. Standard type football helmet is headcover. The mask is one-eighth inch steel wire, crossed with a 1 inch mesh, spot welded at the intersections. A four-inch square of sponge rubber sewn into the lower part of the mask serves as a chin protector.

ANNEX 2 & 3:

Front and rear view of the smoke-jumper jump suit, consists of coat and pants. Both are made of 10 to 12 ounce canvas, padded at the elbows, shoulders, knees and hips with a layer of felt. The high collar on the coat prevents limbs from catching under the helmet and injuring the jumper. The trousers also have a strip of heavy webbing that runs from the ankle of one leg up and over the crotch, and down the other leg to the other ankle. This assists the jumper on opening shock and aids in the prevention of injury to the jumper if he lands astride a limb. A pocket is sewn on the left leg to hold the let-down ropes during the jump. Gloves are worn to prevent riser burns or abrasions from the trees and brush on landing.

ANNEX 4:

Air Corps mechanic-type suit, used by the jumpers of the 555th Parachute Infantry Battalion in lieu of the suits described in Annex 2 and 3, above. The suit was made of a soft leather, lined with sheepskin. It is a two piece suit and was modified to be adequate for smoke-jumping. The coat collar was stiffened with a heavy, stitched duck, and made high to offer protection to the neck and head. The trousers were reinforced with webbing in the same fashion as those described in Annex 2 and 3.

ANNEX 5:

Smoke-jumper in the door of plane ready to jump, wearing the standard jumping equipment.

ANNEX 6:

Two fully equipped smoke-jumpers wearing jump suits, Derry slotted back pack assembly and chest pack. Between them is a jump fire fighting pack for a two-man team, consisting of:

1. 5 1/2 foot crosscut saw fastened to plyboard for protection of saw with a streamer attached for drop without chute.

2. Two firepacks, fastened together with snaps, rings and straps, consisting each of one shovel, one pulaski (combination axe and grub hoe), a canteen, flashlight and batteries, mess kit, compass, maps, packboard and two days' rations.

3. Cargo parachute, 24-foot canopy, for dropping the two fire-packs.

4. A set of tree climbers including lineman's belt and safety rope, used for recovering chutes and tools out of trees.

5. Radio used for contact by jumpers with their Fire Base. Normal range is approximately twenty miles. Under good conditions can receive and transmit up to one-hundred miles. Weighs 22 pounds.

6. Goosedown sleeping bags. Weight: approximately 4 pounds.

ANNEX 7:

Cable setup for training in let-down technique. Use of let-down rope, 60-100 feet in length, is taught here. The rope is made of 3/8 inch manila hemp or cotton sash, and has ends taped and wrapped to prevent unravelling. Ropes are looped through "D" rings on the parachute harness in let-down procedure.

ANNEX 8:

Jumper applies the let-down procedure after landing in trees on a jump.

ANNEX 9:

Illustration of chute recovery after jumper extricated himself from a tree.

ANNEX 10:

Men of the 555th Parachute Infantry Battalion preparing to take-off on a fire mission from Pendleton AAB, Oregon.

ANNEX 11:

Smoke-jumper team of the 555th Parachute Infantry Battalion enroute to a fire. Officer with headset is static jumpmaster who must spot-jump the team on its drop area. Civilians in the photo are Forestry personnel, however they are not smoke-jumpers.

ANNEX 12:

Illustrates an actual fire jump by men of the 555th Parachute Infantry Battalion. Smoke is visible in the foreground. The jumper on the extreme left has a white parachute which is difficult to see. The other chutes are of the camouflage type, Derry slot.

ANNEX 13:

Diagram of the Derry slotted chute. The modifications shown can be applied to any flat type chute, such as the Irving T-7 canopy used by Army Parachute troops.

SMOKE-JUMPER HELMET

APPENDIX 11, ANNEX 1

FRONT VIEW
SMOKE-JUMPER SUIT

APPENDIX 11, ANNEX 2

REAR VIEW
SMOKE-JUMPER SUIT

APPENDIX, 11 ANNEX 3

AIR CORPS MECHANIC SUIT

APPENDIX 11, ANNEX 4

AIRBORNE
SMOKE-JUMPER

APPENDIX 11, ANNEX 5

SMOKE-JUMPING EQUIPMENT

APPENDIX 11, ANNEX 6

LET-DOWN TRAINING

APPENDIX 11, ANNEX 7

TREE LANDING AND LET-DOWN

APPENDIX 11, ANNEX 8

PARACHUTE RECOVERY

APPENDIX 11, ANNEX 9

431745

Typical scene illustrating the third stage of a parachute canopy being retrieved from tree landing.

MEN OF 555TH PCHT INF BN
PREPARE FOR FIRE MISSION

APPENDIX_11 ANNEX 10

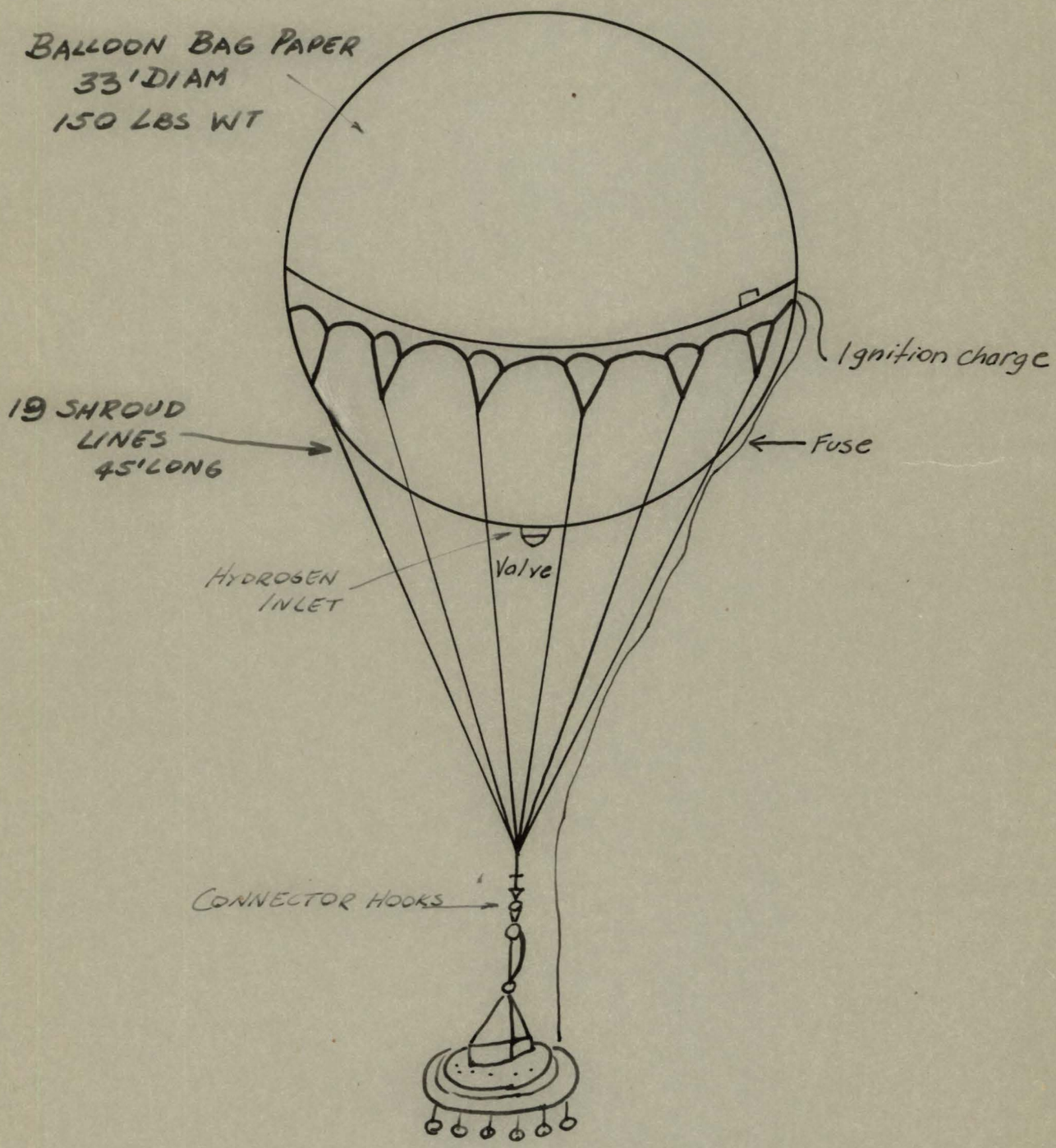
ENROUTE TO FIRE MISSION

APPENDIX 11, ANNEX 11

MEN OF 555TH PCHT INF BN
ON LIVE FIRE JUMP MISSION

APPENDIX 11, ANNEX 12

JAPANESE BALLOON BOMBS



APP III ANNEX 1

APPENDIX III, Annex 2

SAGAMI ARSENAL INSPECTION TAG

PLACE OF MANUFACTURE	SAGAMI NAVAL ARSENAL #2 Shop		Balloon No.	262
CLASSIFICATION	#102 Balloon (or aerostat) 1( )			
DATE OF MANUFACTURE	22 Feb 45			
DIMENSIONS	A. Outer Diameter	10.160 meters	B. Outer Diameter	10.140 meters
WEIGHT	Balloon Body	66.800 kg.	Ropes	10.00 kg.
PRESSURE TESTS	Initial Pressure	70 millimeters	Descent Volume	6 millimeters
LEAKAGE TESTS	Initial Pressure	50 millimeters	Descent Volume	0 millimeters
EXTERNAL APPEARANCE	No objections			
FINDING	1st Class Eligibility (re-passing of examination)			
DATE OF ACCEPTANCE	1 Mar 45			SEAL

Above is a translation of a tag found in the envelope of a balloon discovered in the state of Washington on 13 March 1945. (HQ Western Defense Command, G-2 Periodic Report 24 March 1945.)

ANNEX 3

APPENDIX III

BALLOON INCIDENTS
NOV 1944-JUL 1945

STATE	NO. FOUND
Arizona	2
California	20
Colorado	3
Idaho	9
Iowa	3
Kansas	1
Michigan	2
Montana	33
Nebraska	6
Nevada	8
North Dakota	2
Oregon	28
South Dakota	8
Texas	3
Utah	4
Washington	20
Wyoming	9
Total	161

CANADA

Alberta	17
British Columbia	42
District of McKenzie	4
Manitoba	6
Saskatchewan	7
Yukon Territory	5
Total	81