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FIRELINE NOTEBOOK

(Ref. FSM 5134.5 and FSH 5109.13)

U.S.D.A.
FOREST SERVICE
REGION 1

STANDARD FIREFIGHTING ORDERS
(Reference FSM 5135.51)

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times, observing personally and using scouts.
3. Base all actions on current and expected behavior of fire.
4. Have escape routes for everyone and make them known.
5. Post a lookout when there is possible danger.
6. Be alert, keep calm, think clearly, act decisively.
7. Maintain prompt communication with your men, your boss, and adjoining forces.
8. Give clear instructions and be sure they are understood.
9. Maintain control of your men at all times.
10. Fight fire aggressively but provide for safety first.

Fire Situations That Shout, "Watch Out!"
(Reference FSM 5135.52)

1. You are building line downhill toward a fire.
2. You are fighting fire on a hillside where rolling material can ignite fuel below you.
3. You notice the wind begins to blow or increase or change direction.
4. You feel the weather getting hotter and drier.
5. You are on a line in heavy cover with unburned fuel between you and the fire.
6. You are away from burned area where terrain and/or cover makes the travel difficult and slow.
7. You are in country you have not seen in the daylight.
8. You are in an area where you are unfamiliar with local factors influencing fire behavior.
9. You are attempting a frontal assault on a fire with tankers.
10. You are getting frequent spot fires over your line.
11. You cannot see the main fire and you are not in communication with anyone who can.
12. You have been given an assignment or instructions not clear to you.
13. You feel like taking a little nap near the fireline.

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INTRODUCTION

This Fireline Notebook provides policy, organization charts, job descriptions and instructions from FSM 5130, FSH 5125.3 and FSH 6179.12 for ready reference by fireline overhead. The information is intended to help the fire overhead team:

1. Size up the job--fuels, weather, topography.
2. Plan the men, equipment, and facilities needed.
3. Organize and direct the job with confidence, speed, and efficiency.

The organization, management, and firefighting principles and procedures are Service-wide standards and are essential to good fire management.

Fire Suppression Policy

1. Fire suppression will be fast, energetic, and thorough on (a) National Forest land; (b) intermingled or adjacent lands when such fires constitute a threat to National Forest land; and (c) lands protected by the Forest Service under contract. Human lives must never, knowingly or carelessly, be subordinated to other values in fire control work.
2. Ten o'clock control. When initial attack forces fail to suppress a fire, the policy will be to (a) promptly analyze the existing situation; (b) calculate the spread; and (c) organize and activate sufficient strength to control every such fire within the first work period. If the fire is not controlled in the first work period, the attack for each succeeding day will be planned and executed to obtain control before 10 o'clock the next morning. Subject to the action required above, expenditures for fire suppression will be held to minimum. Expenditures will vary with the values endangered, being higher if necessary where values are high and lower in areas where values are low.
3. Individuals will be assigned fire suppression positions on the basis of recognized fire suppression capabilities and without regard to administrative position.
4. No fire will be abandoned until it is out, unless by order of the fire boss, Ranger, or Supervisor.
5. The District Ranger will personally attend all class C or larger fires unless prevented by a more serious situation elsewhere.

6. Basic firefighting, fire behavior, and fire safety training will be given to all employees assigned fire suppression responsibilities.

7. Injured firefighters must be treated promptly and transported to a doctor's office or hospital (not remaining in the fire camp except in cases of minor injuries or ailments).

PART I - FIRE SUPPRESSION SAFETY

Firefighting is dangerous work. The objective is to accomplish it safely. Knowledge of hazards and safe working practices are firefighting requirements.

General safety principles and practices to be considered on every fire are:

1. Workers and overhead must be in good health and physical condition and from 18 to 60 years of age.
2. All workers shall be instructed in area hazards and safe working practices before starting work. The crew or squad boss shall be identified for crewmembers.
3. Escape routes shall be picked and crew bosses and squad bosses shall instruct men on escape route use.
4. Prompt first aid shall be given for all injuries and illness. Experienced first-aid men and adequate facilities shall be assigned to each fire camp. Form CA-1 will be completed by the immediate work supervisor at the time of injury or illness.
5. Fire-weather forecasts shall be studied, understood and used by overhead on the fire, to help anticipate fire behavior.
6. Emergency nature of firework must not permit use of unsafe food or water or development of unsanitary camp conditions.
7. Safe, durable work clothing required for firework includes hardhats, lace-type work boots, long-sleeve shirts, good trousers, socks, jacket, and work gloves.
8. Reasonable rest periods shall be provided to allow men reserve strength for emergency. On the fireline, men shall remain in their work areas for rests and lunches instead of gathering in groups. Sites for resting, lunching or bedding down shall be in places safe from running fires, falling trees and snags, rolling rocks, moving vehicles, or pack stock.
9. Where possible, get night shifts on line in daylight for orientation, or provide overhead from day shift. Where fireline hazards are serious, it may be wiser, safer, and more productive to have no night shift.
10. Firefighters must avoid contact with powerlines by water streams and by personal contact if lines are on the ground.
11. Only the falling crew should be allowed in areas where snags are being felled.

12. Men should pass a burning or fire-weakened tree on the uphill side, or above the lean, watching it closely.

13. All firefighters shall be alert to the action of the fire, especially noting any increase in burning rates.

14. Frequent checks of men and their safety shall be made by fire overhead following flareups, confused action, or line breakovers.

15. Fire shelters will be provided in accordance with instructions of the fire boss. (See Fire Boss Duties, item 2m.)

16. Dozer lines may be a source of latent hazards in the form of weakened trees and loose rocks long after the dozer has passed the area.

17. Know and observe the ten Standard Firefighting Orders and the thirteen Fire Situations that Shout "Watch Out!" (See cover of Notebook.)

Safety Pointers

Building Fireline From Top Down. Sometimes it is necessary to construct a fireline downhill. This is a hazardous practice when done in fast-burning fuels and steep topography, because of the danger that the fire may cross the slope below the crew and sweep uphill to trap them. A fireline should not be built downhill in steep terrain and fast-burning fuels, unless there is no suitable alternative for controlling the fire; and then only when the following safety requirements are adhered to:

1. The decision is made by a competent fireman after thorough scouting.

2. The toe of the fire is anchored.

3. The fireline does not lie in or adjacent to a chimney or chute, that could burn out while crew is in vicinity.

4. Communications are established between the crew working downhill and the crew working toward them, which may be at the toe of the fire. When neither crew can adequately observe the fire, communications will be established between the crews and a lookout posted where he can see the fire's behavior.

5. The crew will be able to rapidly reach a zone of safety from any point along the line if the fire unexpectedly crosses below them.

6. Direct attack will be used whenever possible.

7. If direct attack is not possible, the fireline should be completed between anchor points before being fired out. Firing operations should proceed with assured access to the burned-out part of the fireline or other safety zones.

Tractor Use

1. Do not sit or bed down near tractor.

2. When idling or stopped, tractor blades should be on ground.

3. Do not get immediately in front or back of a tractor in operation.

4. Allow no one but operator to ride on tractor, except spotter or tractor boss when necessary in heavy brush.

5. Never get on or off moving equipment.

6. No men are to work directly above or below a tractor.

7. Have lights for tractor working at night. All personnel working with tractors have two-way spotlights.

8. Learn and use tractor hand signals for direction and safety.

9. Provide spotter for all tractor work.

10. Do not use tractor without canopy in timber or woodland areas.

11. Post lookout when there is a chance of fast fire runs.

Powersaws

1. Stop motor when carrying saw, making adjustment, repairs, or cleaning.

2. When carrying saw in rough country, blade will be guarded.

3. When refueling, cool motor, fill on bare ground, move at least 10 feet to start.

4. Safety chaps will be worn when available.

Handtools

1. Select the right tool for the job. See that it is in good condition.
2. When walking, workers shall stay over 6 feet apart. Carry tool in hand on downhill side.
3. Men shall keep at least 10 feet apart when constructing line.
4. Crew leaders shall teach untrained workers the proper use and safeguards pertaining to the tool they are using.
5. Cutting tools shall be sheathed when carried to and from the fire.
6. When not in use, place tools in safe place against a tree or log, or flat on the ground.
7. Always chop away from feet, legs, and body.

Backfiring Equipment

1. Equipment shall be used only by trained men.
2. Do not pass fusees out indiscriminately.
3. Backfire personnel shall wear goggles, long-sleeved shirts, gloves, and laced boots to protect from heat and hot fusee slag.
4. Special protective clothing shall be provided for power flamethrower operator.
5. Use no more than one part gasoline to three parts diesel or heavier oil in flamethrowers or drip torches. Observe manufacturer's recommendations.

Snag Falling

1. Planned, cleared escape routes shall be prepared and a dry run made before felling snag.
2. Only experienced, trained men will fell snags.
3. Post lookout to watch for falling branches.
4. Post guards along roads or on fireline to warn and stop men during falling operation.

Transportation

1. Drivers' shifts shall not exceed 12 hours.
2. Alert overhead shall ride in cab with driver when hauling men.
3. All passengers in vehicles shall be seated with arms and legs inside truck bed.
4. Men and loose tools shall not be transported together.
5. Driver shall be skilled and vehicle safe. If not, ground them.
6. When traveling to a fire, observe all traffic signals, safe speed limit, and all safety rules.
7. Driver shall walk around vehicle to make sure all is clear before taking off.
8. Driver is responsible for arrangements to insure that chock blocks are placed before loading, unloading, or parking on slope.

Fire Camp

1. Observe all sanitary precautions. Select safe water supply or haul water. Require use of latrine areas by all personnel.
2. Select sleeping areas out of danger from vehicle or tractor travel.
3. Provide first-aid care for injuries.
4. Erect signs or barriers where hazards exist.
5. Check physical condition and clothing of men before sending to line.
6. Provide safe transportation, sharp, well-conditioned tools, plenty of water, and good lunches for men.

Tankers

1. Crews shall be fully trained in firefighting and use of tanker equipment.

2. A tanker operator, hose puller and nozzle men are usually the minimum safe and effective tanker crew.
3. Hold tankers a reasonable distance from hot fires, using hose to reach fire edge.
4. Park tanker on edge of road away from fire to reduce heat and to keep road open.
5. Have tanker crew wear goggles or face shield and protective clothing.
6. With hot fires coming uphill, use flank attack rather than frontal attack.

Helicopter Use

1. Check pilot for current Forest Service Pilot Qualification Card.
2. An air service manager shall be stationed at each heliport and helispot to supervise loading, unloading, and enforce safety rules and schedule flights.
3. Keep clear of main rotor and tail rotor at all times. Approach or leave from front or side in plain sight of pilot. Never approach or leave on side where ground is higher than where copter is standing.
4. Personnel working around helicopter shall wear goggles.
5. Pilot shall have at least 1 hour rest during each flying day; flight time will not exceed 8 hours the first day and 6 hours on succeeding days. After 6 days of flight, a full day's rest is required.
6. All passengers shall wear either a crash helmet or hard hat with chin strap.

Paracargo Drops

1. A cargo retrieving crew leader under the supply officer shall be in charge at drop site.
2. Drop danger zone is 200 feet on each side, 300 feet on approach leg and 1,300 feet on getaway leg. Keep all personnel, animals, and equipment out of this zone.

3. Put fire camp at least 600 feet from target area, outside danger zone.
4. Allow no one in danger zone until drop is complete.
5. Have lookouts spot and count cargo from outside drop zone.

Air Tanker Use

1. Clear men out of direct area when retardant drop is to be made. Return when drop is done to take advantage of effect of retardant on fire.
2. Men remaining in retardant drop area should lie on ground, face down, facing approach of plane. Keep hardhat on.
3. Minimum flight height is 75 feet above natural cover or obstacles.
4. All air tankers shall have two-way radios.

Air Base Safety

1. Provide crash truck or chemical fire extinguishers.
2. Establish loading procedure and taxi pattern.
3. Keep all unauthorized persons and vehicles clear of taxiways.
4. Provide dispatch procedure for clearance to land, taxi, loading instructions and takeoff.
5. Keep mixing area, taxiways, and work area clear of wet slurry.
6. Provide goggles and respirators for mixing crew.
7. Post no smoking signs at refueling and hanger areas.
8. Crash helmet, safety belt, shoulder harness, and parachute should be worn by each air tanker pilot.
9. Limit pilots to 8 hours flying time first day and 6 hours for next 5 days. Pilots shall take 1 hour rest after 4 hours continuous flying.
10. No passengers shall be allowed to ride on air tanker missions.

11. Check pilots for current Forest Service approval qualification card.

12. All aircraft flying on fire missions shall have two-way Forest Service radios.

Weather Security Watch (Purpose: For detecting and warning of sudden weather changes.)

1. Weather observations are obtained within 15 miles of the fire from two to four exposed locations.

2. Observed weather is transmitted to the responsible officer every 30 minutes or as abrupt changes occur.

3. Observations should include temperature, relative humidity, wind, and cloud formations.

Emergency First Aid

1. All supervisory personnel shall be trained in emergency first aid.

2. Pocket first-aid kits and snakebite kits should be available for all crew bosses and above.

3. Immediate first aid will be given for all injuries.

4. Serious injuries which are most common on fireline and require careful attention are:

a. Burns - chief danger, shock and infection.

(1) Treat for shock.

(2) Cover to keep out air; keep clean.

(3) Do not break skin or blisters.

(4) Transport carefully to medical attention as soon as possible.

b. Shock - will develop in any serious injury; treat immediately.

(1) Keep patient lying down with feet raised.

(2) Maintain body heat (do not keep too warm).

(3) Give fluids unless unconscious or abdominal injury.

(4) Transport to doctor.

c. Wound with severe bleeding.

(1) Stop bleeding by direct pressure; use thick layer of gauze, apply firm pressure, bandage snugly.

(2) Use tourniquet as last resort. Once applied, do not loosen.

(3) Treat for shock.

(4) Transport to doctor.

5. General.

a. Splint all broken bones before moving patient.

b. Do not be hurried into transporting an injured person until proper equipment is available unless absolutely necessary.

c. To prevent heat exhaustion, encourage liberal use of salt in fire camp cooking.

6. Serious Injury or Accident Reminders.

a. Give first aid; call for medical help and transportation as needed.

b. Do not release victim's name, except to authorities, or mention on the radio until next of kin notified.

c. Notify fire boss so Ranger and Supervisor can be notified. They can then:

(1) Notify Regional Forester if condition of victim is critical.

(2) Assign a man to head up evacuation.

(3) Assign a man to get the facts, statements, and to preserve evidence until investigating team takes over.

(4) Prohibit unauthorized picture taking or release of pictures.

7. Fatality.

- a. Do not move body. Try to establish positive identification.
- b. Notify fire boss of need for coroner.
- c. Do not release victim's name, except to authorities, or mention on the radio until next of kin notified.
- d. Notify fire boss so he can have Ranger and Supervisor:
 - (1) Notify Regional Forester to report essential facts.
 - (2) Help coroner as needed.
 - (3) Assign an investigator.
 - (4) Prohibit unauthorized picture taking except as needed by coroner.

8. Motor Vehicle Accidents. If a motor vehicle accident results in death, injury or vehicle damage, a report must be made. The highest ranking Forest Service officer on the scene is to take measurements, photographs, sketches and witness statements. Record the facts you know and get written statements of facts from others.

Accident Investigation Procedure

Who Should Investigate. The sector boss or other officer in charge of the immediate area is responsible for investigation until relieved by proper authority. He should notify his immediate superior as soon as possible.

What To Investigate

1. All cases of death or serious injury.
2. All motor vehicle accidents (including rentals).
3. All tractor and other hired equipment.
4. All boat and packstock accidents.
5. All aircraft accidents.
6. All accidents involving non-employees.

How To Investigate

1. Get the following information on injured personnel:
 - a. Name, address, age, occupation, and sex.
 - b. Date and hour of injury.
 - c. Place.
 - d. Type of accident and extent of injury.
 - e. Equipment or tools being used.
 - f. Name of immediate superior (crew boss).
2. Get the following information on damaged equipment:
 - a. Type, make, model, year, serial number, and extent of damage.
 - b. Name of driver, owner, whether disabled, and time of accident.
 - c. Type of accident (how did it happen).
3. Secure name, address, occupation, and employer of all witnesses.
4. Take photographs or make sketches of accident scene.
5. Determine answers to: Who? Where? When? What? Why?
How?

PART II - ESTIMATING GUIDES - FIRE PLANNING

Firefighting Principles and Procedures

The firefighting principles and procedures in FSH 5125.3, Fireman's Guide, are Service-wide standards.

Planning Control. The effectiveness of control action on large fires depends on obtaining complete and accurate information with the least possible delay. Sizing up a fire and scouting are particularly important preceding and during first attack.

When a fire is reported, and prior to arrival of the fire boss, the dispatcher or other responsible Forest officer dispatches initial attack forces.

When the fire boss arrives at the fire, his first job is to size up the immediate situation, calculate the control job, estimate the suppression forces required, and inform the dispatcher of needs.

Sizing Up Fire

1. Rate of Spread. It is essential to know the present location of the fire perimeter, and probable location when initial attack forces and reinforcements arrive. The fire boss decides on the location of the probable final control line based on estimated rate of spread, as determined by fuel, topography, and weather influences. Rate of spread is expressed as chains of perimeter increase per hour, and should be estimated on the head, flanks, and rear of the fire.

The following are important in considering rate of spread:

a. Character of Fire. Refers to type and intensity. Types of fire are:

(1) Smoldering. Fire burning without flame and barely spreading.

(2) Creeping. Fire burning with a low flame, and spreading slowly.

(3) Running. Fire spreading rapidly with a well defined head.

(4) Spotting. Fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

(5) Crowning. Fire advancing from crown of trees or shrubs.

b. Fuels. The fire boss must consider the fuel types in and adjacent to the fire. He is interested in volume, arrangement, position, size of material, and the location of snags. Tactics for control vary by fuel types.

(1) Volume and Size. Volume and size of fuel on an area are two of the most obvious factors affecting rate of spread. The fire boss must observe if the fuel is composed of fine-, medium-, or large-size material. Fine material, such as grass, burns fast. Medium- and large-size material burns slower, but longer and hotter, and requires more work to control. Fuel volume and fuel size may determine the method of attack and size of job.

(2) Position and Arrangement. Continuity and arrangement of fuels are sometimes more important than volume.

c. Intensity Indicators

(1) Presence of Fire Whirlwinds or Dust Devils. Small as well as large ones often spread fire.

(2) Flame Length. This will vary with fuel types. In conifers, flames may reach 150 feet or more. The greater the length of flame the more intense the fire.

(3) Smoke. Color indicates type of fuel burning, intensity of fire, and degree of combustion. Light blue smoke usually indicates a small fire or low rate of spread, but in some fuels it could mean a hot burning fire with complete combustion. Heavy black smoke caused by incomplete combustion usually indicates heavy fuels, or a crown fire. A "mushroom" column indicates a fire sufficiently intense to create its own microclimate.

d. Present and Forecast Weather Conditions

(1) Wind

(a) Velocity is measured in miles per hour.

(b) A sudden, radical, or sustained change in wind direction may indicate a change in weather.

(c) Unstable air condition is indicated by dust devils, fire whirlwinds, and thunderheads. Thunderheads cause updrafts and downdrafts with consequent gusty and variable winds.

(2) Temperature. Preheating effect of high temperature on fuels causes them to burn faster. Increased air temperature affects movements of air currents.

(3) Fuel Moisture. This is usually taken at closest weather- or fire-danger station. Due to aspect, fuel moisture on the fire area may be higher or lower than recorded at the same elevation elsewhere.

(4) Relative Humidity. The amount of moisture in the air affects fuel moisture content but there is usually a timelag in fuel moisture change when relative humidity changes.

e. Topographic Features Affecting Rate of Spread

(1) Shape. The location and size of ridges, flats, saddles, coves, ravines, and swamps, the aspect and elevation of each, and their relation to the head, flanks, and rear of fire affect rate and direction of spread.

(2) Slope. An increase in slope is comparable to adding several miles of wind velocity to a fire. An increase in slope may affect the rate of spread because burning material can roll into unburned areas, and spotting will be more intense.

(3) Aspect. Aspect affects fuel moisture, temperature of fuels, and volume of fuels. There is more moisture on north than south aspects, as they do not receive direct rays of the sun.

(4) Barriers. Barriers may greatly affect rate of spread. Cliffs, roads, streams, lakes, meadows, swamps, savannas, and fields are examples. They may serve to check the spread of a main fire head and permit attack forces to concentrate on the flanks. A barrier at the rear may completely check the backspread and permit all forces to concentrate on stopping the head.

2. Resistance to Line Construction. The relative difficulty of constructing a control line is expressed as the chains of line one man can build and hold per hour of work. It is determined by the fuel, topography, and soil. A reasonable estimate of the rate at which a man may work is essential to estimate the manpower requirements, and decide if initial attack forces are adequate.

The following are important factors affecting resistance to control:

a. Fuels. Heavy snag and blowdown areas, slash concentrations, or deep duff and swamps increase the difficulty of line construction. Burning snags increase chances of spot fires and require extra manpower to fall. Light fuel, such as sedgegrass or bunch grass, offers low resistance to line production and may permit direct attack.

b. Topography. Irregular topography produces erratic local wind currents and slows line production. There is danger of fire spotting across steep, narrow canyons. As slopes increase, there is greater chance of rolling debris crossing the fireline. Flat or rolling areas make possible more rapid production by mechanized equipment.

c. Soil Conditions. Rocky soil and boulders, compact clays, or dry organic soils show line building and may prevent or greatly hinder the use of heavy equipment. Loam soils, which usually occur in flat to rolling country, permit mechanized attack.

d. Hazardous Topography. Boulders, slides, cliffs, steep side slopes, or boggy swamps may be dangerous to crews, and add many hours to the time needed for control. Steep topography may cause a fire to move into different zones of the wind profile.

3. Direction of Spread. The location of urban improvements, high investment resource developments, and other high values in the immediate path of the fire, must be considered in determining location for the control line. Examples of these are:

a. Urban. Communities, towns, cities, rural residence centers, and resorts.

b. Resources. Recreation areas, Experimental Forests, well stocked reproduction areas, and important ranges.

c. Watersheds. Critical watersheds serving industry and municipalities.

Calculating Job. By appraising the combined weather forces, fuel, and topography to estimate rate of spread, and the fuel, topography, and soil conditions to estimate resistance to line construction, the fire boss can calculate probable spread of the fire to determine manpower, equipment, and services needed for control.

The fire boss should start this calculation when a fire is reported. On small to medium-size fires, it may be completed when he arrives on the scene and quickly surveys the situation. Attack is initiated immediately and control may be complete in a

comparatively short time. On large fires, high-intensity fires, or any fire predicted to have dangerous blowup characteristics, scouting will be necessary and must be started immediately.

The fire boss will use rate-of-spread estimates to delineate on a map the location of the fire perimeter at successive intervals of time. The map record becomes part of the control plan. It serves as a guide in planning, and will be basic information to the plans section. With probable fire perimeter outlined, chains of line to construct may be calculated for present and successive work periods.

Calculating Needs. When the job load has been determined, the fire boss will calculate needs for control. If experienced, he will make mental estimates of needs and quick decisions on the spot. These estimates and decisions must be recorded for possible later reference.

1. Line Function

a. The following example will serve as a guide to calculate manpower needs for control line location decided on in the first work period:

	<u>Example</u>
(1) Estimate chains of control line to construct based on rate of spread.	120 chains
(2) Estimate length of held line which can be constructed per man-hour (resistance to control).	0.25 chain
(3) Divide (1) by (2). This will give the number of man-hours of work needed to control in the first work period.	$\frac{120}{0.25} = 480$
(4) Estimate number of hours the crew or crews will have available before 10 a.m. of the following day.	8 hours
(5) Divide (3) by (4). This will give the number of men needed for line construction, provided they all start work at the same time (add necessary SOS and overhead not on fireline).	$\frac{480}{8} = 60$

Ordinarily, all the men will not arrive on the fire at the same time. An allowance must be made for this as well as for the effective time of men working on the fire when the estimate is made.

b. Basic estimates will be raised or lowered as dictated by the following factors which may influence needs:

(1) Number of experienced overhead available to direct work.

(2) Efficiency and fitness of manpower.

(3) Accessibility of sectors and mobility of workers.

(4) Fatigue due to long, steep hikes to fireline.

(5) Elevation and temperature as affecting output per man.

(6) Method of control to be used.

(7) Night or day work.

(8) Opportunities for use of equipment:

(a) If water is available--need for pumps, tank trucks, gravity systems, and hose.

(b) Amount of control line that can be constructed by plow units and dozers. Where machinery is available and can be used, the amount of effective work it can accomplish will reduce manpower needed.

(c) Consider use of air tankers to strengthen attack.

(d) Scouting, and transportation of men and equipment, may be expedited by use of helicopters.

(9) Natural breaks that may be held with a minimum of effort. Examples are roads, barren ridges, rock flats, sharp ridges, streams, meadows, lakes, wet swamps, and fields.

(10) Sections where work may be temporarily postponed, such as along the border of a green timber stand, where the fire is smoldering, areas of sparse and slow burning fuels, the downhill or windward side of the fire, and areas near natural barriers.

2. Plans Function. As a fire becomes larger and more complex, a plans section will be needed.

The job of gathering up-to-the-minute information, preparing maps and records, and making predictions will expand rapidly. The fire boss should recognize this need and designate a plans chief. The full function of plans and intelligence should be activated as needed. See organization charts in part III.

3. Service Function. The fire boss should similarly recognize the need to feed, rest, and supply suppression forces. The service section will usually be activated by a camp officer. As the job grows, a service chief will be designated to handle service of supply, exclusive of financial management.

4. Finance Function. As the size of suppression forces increases, business management responsibilities will necessitate activating a finance section to handle timekeeping, payrolling, compensation for injury, commissary, and claims.

Planning Attack

1. Initial attack forces should be assigned to the key sector of the line, as determined by the fire boss. This is a critical decision and may determine whether the fire (a) is contained during the first work period or (b) requires replanning for extra period action.

2. Time of arrival and number of reinforcements may also be critical to control action. The fire boss must order reinforcements as soon as he anticipates they are needed.

Such opportunities for, or limitations to, quick control as the following will be apparent to the fire boss from his initial appraisal, and may lower or raise his estimate of needs:

<u>Apparent opportunities for quick control</u>	<u>Apparent limitations to quick control</u>
Fire burning downhill	Fire burning uphill
Forecasts of favorable weather	Forecasts of unfavorable weather
Change to less hazardous fuels	Heavy snag area or slash concentration ahead
Light fuels	No usable barriers ahead
Usable barrier ahead	Heat of day approaching
No wind	Spotting likely
Approaching nightfall with rising humidity and fuel moisture	Difficult access
Easy access	

It is important not to underestimate the job. Fire bosses should plan for a safe margin of strength in attack, but avoid excessive overmanning insofar as possible.

3. Replanning the control job is a continuous process. The fire boss, and his staff, continually gain new information on the progress of the fire. Unpredicted weather conditions may increase fire intensity; wind shifts may cause new fire heads to develop; topography may get worse, or better affecting control. Control forces may not be available when needed. Mechanized equipment which might be used may not be available. Communications may fail.

The fire boss must be constantly alert to such changes and replan the job accordingly.

Table 1.--Line construction output in chains a man-hour
(Does not include line holding and cleanup)

Type of worker	Fuel resistance			
	Low	Medium	High	Extreme
Smokechasers, guards	3.3	2.0	.8	.25
Trained forest crews	2.5	1.5	.6	.2
Untrained woods workers	1.25	.8	.3	.1
Pickup firefighters	.8	.25	.08	.02
Dozer unit	50.0	20.0	8.0	4.0

Table 2.--Smokechaser units of output according to size of crew employed and number hours worked

Hours of work	Number of men										Fatigue factor included according to number hours worked
	1	2	3	4	5	7	10	15	20	25	
1	1.00	2.00	3.00	4.00	4.95	6.86	9.50	12.7	14.0	15.0	100
2	2.00	4.00	6.00	8.00	9.90	13.7	19.0	25.5	28.0	30.0	100
3	2.97	5.94	8.91	11.9	14.7	20.4	28.2	37.9	41.6	44.6	97
4	3.82	7.64	11.5	15.3	18.9	26.2	36.3	48.7	53.5	57.3	85
5	4.51	9.02	13.5	18.0	22.3	30.9	42.8	57.5	63.1	67.7	69
6	5.06	10.01	15.2	20.2	25.0	34.7	48.1	64.5	70.8	75.9	55
7	5.52	11.0	16.5	22.1	27.3	37.9	52.4	70.4	77.3	82.8	46
8	5.92	11.8	17.8	23.7	29.3	40.6	56.2	75.5	82.9	88.8	40
9	6.27	12.5	18.8	25.1	31.0	43.0	59.5	79.9	87.7	94.0	35
10	6.60	13.2	19.8	26.4	32.7	45.3	62.7	84.1	92.4	99.0	33
11	6.91	13.8	20.7	27.6	34.1	47.4	65.6	88.1	96.7	104.0	31
12	7.21	14.4	21.6	28.8	35.7	49.5	68.5	91.9	101.0	108.0	30
13	7.50	15.0	22.5	30.0	37.1	51.4	71.2	95.6	105.0	113.0	29
14	7.78	15.6	23.3	31.1	38.5	53.4	73.9	99.2	109.0	117.0	28
15	8.05	16.1	24.1	32.2	39.9	55.2	76.5	103.0	113.0	121.0	27
16	8.31	16.6	24.9	33.2	41.1	57.0	78.9	106.0	116.0	125.0	26
17	8.56	17.1	25.7	34.2	42.4	58.7	81.3	109.0	120.0	128.0	25
18	8.80	17.6	26.4	35.2	43.6	60.3	83.6	112.0	123.0	132.0	24
19	9.03	18.0	27.0	36.1	44.7	61.9	85.8	115.0	126.0	135.0	23
20	9.25	18.5	27.7	37.0	45.8	63.4	87.9	118.0	129.0	139.0	22
	100	100	100	100	99	98	95	85	70	60	← SIZE OF CREW FACTOR USED

Example: 100 chains of line to build--25-man crew could build in 10 hours; 15-man crew could build in 14 hours; or ten 2-man smokechaser crews in 6 hours.

Table 3.--Average initial rate of spread^{1/} according to fuel type, slope steepness, and spread index at site of fire^{2/}

Fuel rate of spread type	Slope steepness ^{3/} (percent)	Spread index									
		1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
Perimeter increase in chains per hour											
Low	0-10	0	1	1	1	2	2	2	3	3	4
	11-25	1	1	1	2	2	3	3	4	5	6
	26-50	1	2	2	3	3	4	4	5	6	9
	51-75	2	3	3	4	5	6	6	8	10	14
	Over 75	3	4	5	6	7	8	9	12	16	21
Medium	0-10	1	1	1	2	2	2	3	3	4	5
	11-25	1	1	2	2	3	3	4	5	6	7
	26-50	2	2	3	3	4	5	6	7	8	11
	51-75	3	3	4	5	6	7	8	11	13	17
	Over 75	4	5	6	8	9	11	14	17	21	27
High	0-10	1	2	3	4	5	6	7	8	10	13
	11-25	1	3	4	6	7	8	10	12	14	18
	26-50	2	4	6	8	9	11	14	16	20	25
	51-75	3	6	9	12	15	18	22	26	30	40
	Over 75	6	10	15	19	24	28	35	42	49	63
Extreme	0-10	3	4	5	6	7	9	12	14	17	20
	11-25	4	6	7	9	10	13	17	20	23	28
	26-50	6	8	10	12	15	19	23	28	33	40
	51-75	9	11	16	19	23	30	36	44	53	62
	Over 75	16	20	25	30	37	46	58	71	84	97
Flash	0-10	6	12	15	18	23	28	33	40	50	61
	11-25	8	18	21	26	32	39	48	58	69	84
	26-50	11	25	30	37	45	55	67	81	97	119
	51-75	18	39	48	58	71	88	106	128	155	188
	Over 75	29	62	75	92	113	138	168	202	244	300

^{1/}Average initial rate of spread refers to perimeter increase between discovery of fire and first attack. This rate of spread may be anticipated during the first 4 to 5 hours.

^{2/}This table was based on table A-16, NRM Station paper No. 29, Fire Behavior, by J. S. Barrows. Changes were made using the relationship of the burning index vs. the national spread index (timber). The original data were used as presented in Station paper No. 29. Conversion work done in 1963 by NFFL, Barney and Stockstead.

^{3/}General descriptions used in slope descriptions are: level, 0 to 10 percent; gentle, 11 to 25 percent; moderate, 26 to 50 percent; steep, 51 to 75 percent; very steep, over 75 percent.

Table 4.--Probable acreage of burned area according to perimeter increase and elapsed time

Hours	Perimeter increase in chains									
	5	10	20	30	40	50	60	80	100	140
	- - - - - Acres - - - - -									
0.5	.0	.1	.5	1	2	3	4	7	11	21
1.0	.1	.5	2.0	4	7	11	15	27	40	80
1.5	.3	1.0	4.0	9	15	24	34	60	90	180
2.0	.5	2.0	7.0	15	27	40	60	110	160	320
2.5	.8	3.0	11.0	24	40	65	90	160	250	500
3.0	1.0	4.0	15.0	34	60	90	130	230	360	712
3.5	1.5	5.0	21.0	45	80	125	180	320	500	950
4.0	2.0	7.0	27.0	60	105	160	230	420	650	1,250
5.0	3.0	11.0	40.0	90	160	250	360	650	1,000	2,000
6.0	4.0	15.0	60.0	130	230	360	520	950	1,450	2,800
7.0	5.0	21.0	80.0	180	320	500	700	1,250	2,000	3,800
8.0	7.0	27.0	105.0	240	410	650	950	1,700	2,600	5,000
9.0	9.0	34.0	130.0	300	520	820	1,200	2,100	3,200	6,500
10.0	11.0	40.0	160.0	360	650	1,000	1,500	2,600	4,000	8,000

1/This table may be used to establish probable approximate size of fire after rate of spread has been estimated. (Source: Fire Control Notes.)

Table 5.--Table of area and perimeter relationships^{1/}

Acres	Square chains	Chains of perimeter ^{2/}		
		Minimum	Usual	Maximum
1	10	11	17	25
5	50	20	40	50
10	100	35	55	70
15	150	45	65	85
20	200	50	75	100
25	250	56	85	110
50	500	80	120	160
75	750	100	145	195
100	1,000	115	170	225
125	1,250	125	190	250
150	1,500	140	205	275
200	2,000	160	240	320
250	2,500	175	265	355
300	3,000	190	280	385

^{1/}Use this table as a guide to estimate areas and perimeters. Remember that results are approximate values only.

^{2/}Fires that are roughly circular in shape will have perimeters that approach minimum values. Fires that are very long and narrow, or with many fingers will have perimeters that approach or possibly exceed maximum values. Values in the usual column will represent fires that are oval or wedge shaped. Most fires in Region 1 will be in this category.

Table 6.--Guide to overhead needs

Workers	Number line workers						
	14	21	63	126	189	370	945
Fire boss	1	1	1	1	1	1	1
Line boss				*	1	1	2
Division boss						2	5
Sector boss				2	3	6	15
Crew boss		1	3	6	9	18	45
Squad boss	2	3	9	18	27	54	135
Air attack boss					*	*	*
Line locators				*	*	*	*
Line scouts			*	*	*	*	*
Service chief					1	1	1
Camp officer (one per camp)			1	1	1	2	5
Communications officer					1	1	1
Air service officer					*	*	*
Equipment officer				1	1	1	1
Tractor boss			*	1	1	1	1
Truck manager				1	1	1	1
Supply officer						1	1
Plans chief						1	1
Information officer				1	1	1	1
Maps and records officer					1	1	1
Intelligence officer					*	*	*
Photo interpreter						*	*
Safety officer					*	1	1
Fire behavior officer					*	*	*
Finance chief				*	*	1	1
Comptroller						*	1
Time officer			1	1	1	1	1
Timekeepers	*	1	1	3	4	6	10
Obligations officer					*	1	1
Claims officer					*	1	1
Commissary manager				*	1	1	2
Compensation for injury officer	1			*	1	1	2

*Need varies. Fill as required by the situation.

PART III - FIRE ORGANIZATION

Organization and Management of Fire Suppression Operations

Organization, as used here, is the executive structure of a fire suppression operation; the personnel of management. Management is the art of using the fire organization to suppress the fire. It includes obtaining information, making plans, providing equipment and facilities, and accomplishing control.

Once the proper kinds and quantities of firefighting resources have been received, they must be organized and directed with confidence, speed, and efficiency. The goal is an organized team tailored closely to the fire problem, with a reserve for the unexpected. Ordering firefighting services must be done rapidly from skill and experience in appraising the facts, and never from panic.

Fundamental Principles. Forest Service firefighting is based on these fundamental principles:

1. Organize within the basic functions of command, line, plans, service, and finance. Fill positions only as needed.
2. Organize to give proper control and direction to both personnel and equipment.
3. Every fire will have only one fire boss at a time.
4. The main functional heads, that is, fire boss, line boss, finance chief, service chief, and plans chief, may have assistants; but the heads will retain their responsibility unless specifically delegated to others during rest periods. Duties of vacant positions will be absorbed by the functional heads or assigned to others in the organization as directed by the fire boss.
5. Tactical decisions and suppression authority must be exercised through the line channels.
6. All personnel will operate through clearly established lines of responsibility and authority.
7. The fire boss, in difficult or complex situations, may avail himself of technical advisers or other assistants as he deems necessary, but these positions will be clearly designated and exercise only delegated authority.

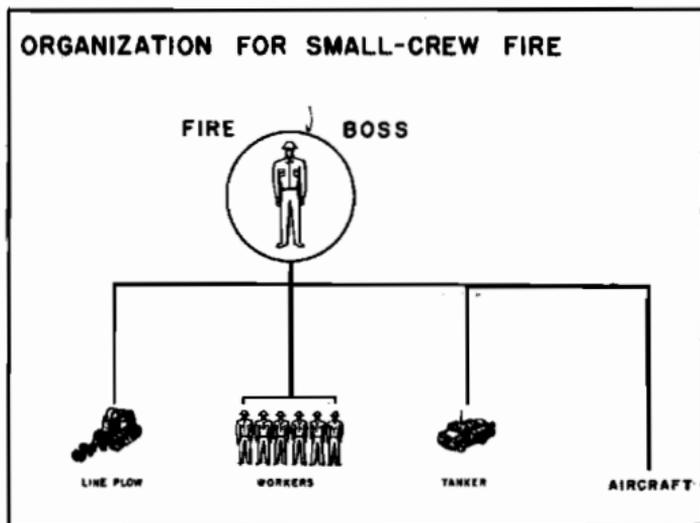
8. Men will be assigned to the fire suppression team on the basis of demonstrated ability rather than on administrative rank. The responsibility and authority that go with assigned fire positions will be fully honored by all personnel on the fire. Fire-boss authority will not be exercised by anyone unless he is the fire boss in name and authority.

Fire Control Organizations

Organization for Small-Crew Fire (Figure 1). Normally a small-crew fire has about six men per shift, or men and equipment combinations.

In a one- or two-man attack on a fire, one man is the fire boss. He is a working boss, but must plan the attack, supply the equipment, and execute his plan. In figure 1, the fire boss supervises his men directly. He is in charge of a small crew or attack unit. If a dozer is used, he may organize with an operator, a burnout man, and two or more line-holding positions. A tanker attack might be organized with a tanker operator, hose pullers, and nozzle man. Even in this simple single-attack-unit fire, organization is necessary.

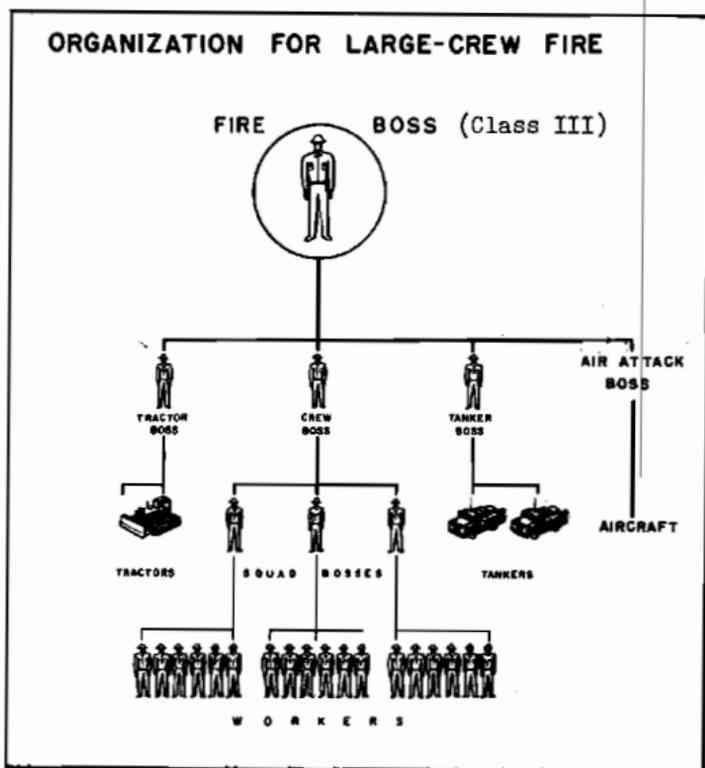
Figure 1



Organization for Large-Crew Fire (Figure 2). Normally a large-crew fire has 21 line workers per shift, or comparable equipment and/or squads.

Here the fire boss divides his men into squads, supervising them through a crew boss. If tankers make the attack, he may supervise them directly through the foreman on each truck or assign a tanker boss. Tractors or plow units would be managed by a tractor boss who would get his directions from the fire boss. With this size organization the fire boss may lend a hand here and there but must not "get his head down" and lose contact with the overall situation. It is his job not only to direct the attack, but to look ahead and inform the dispatch source of further needs.

Figure 2



Organization for Three-Sector Fire (Figure 3). Normally a three-sector fire has 189 line workers per shift or comparable units of equipment and crews.

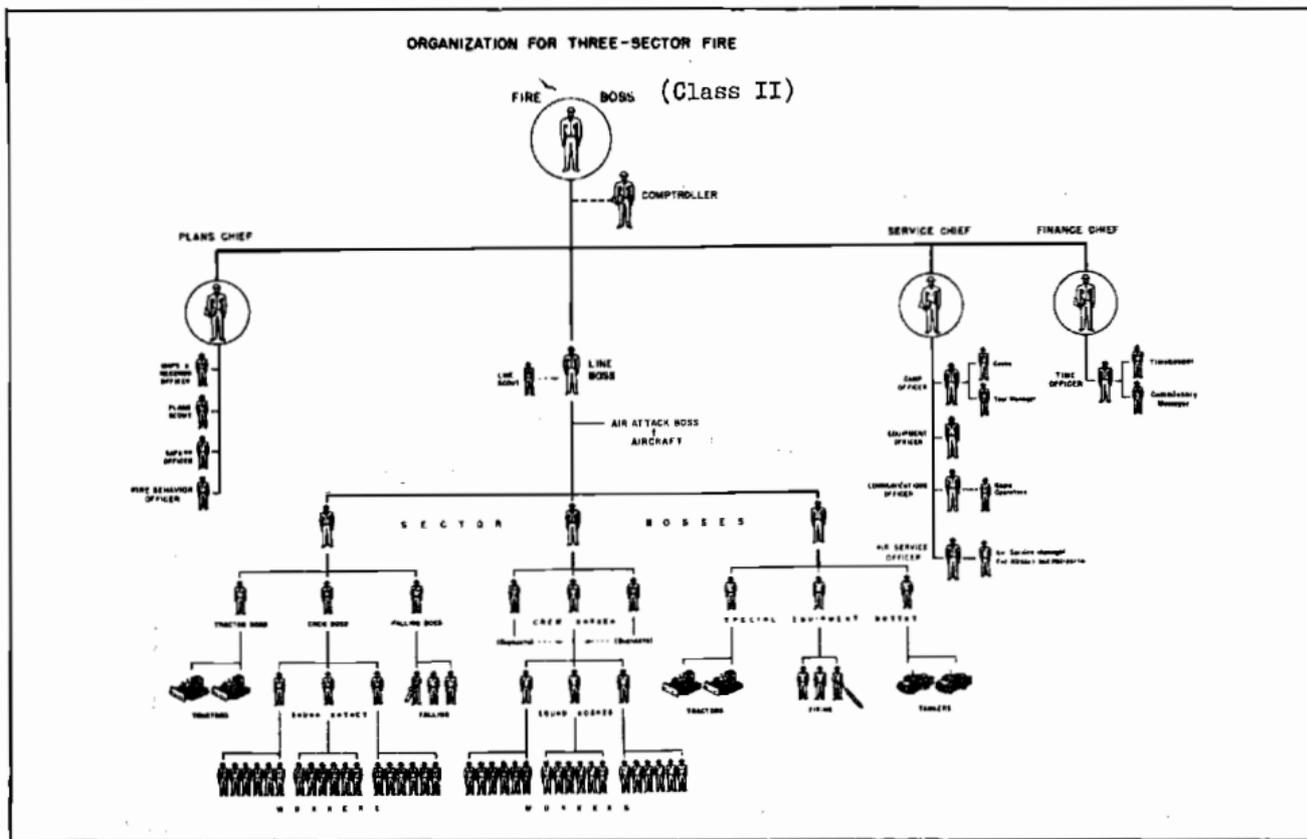
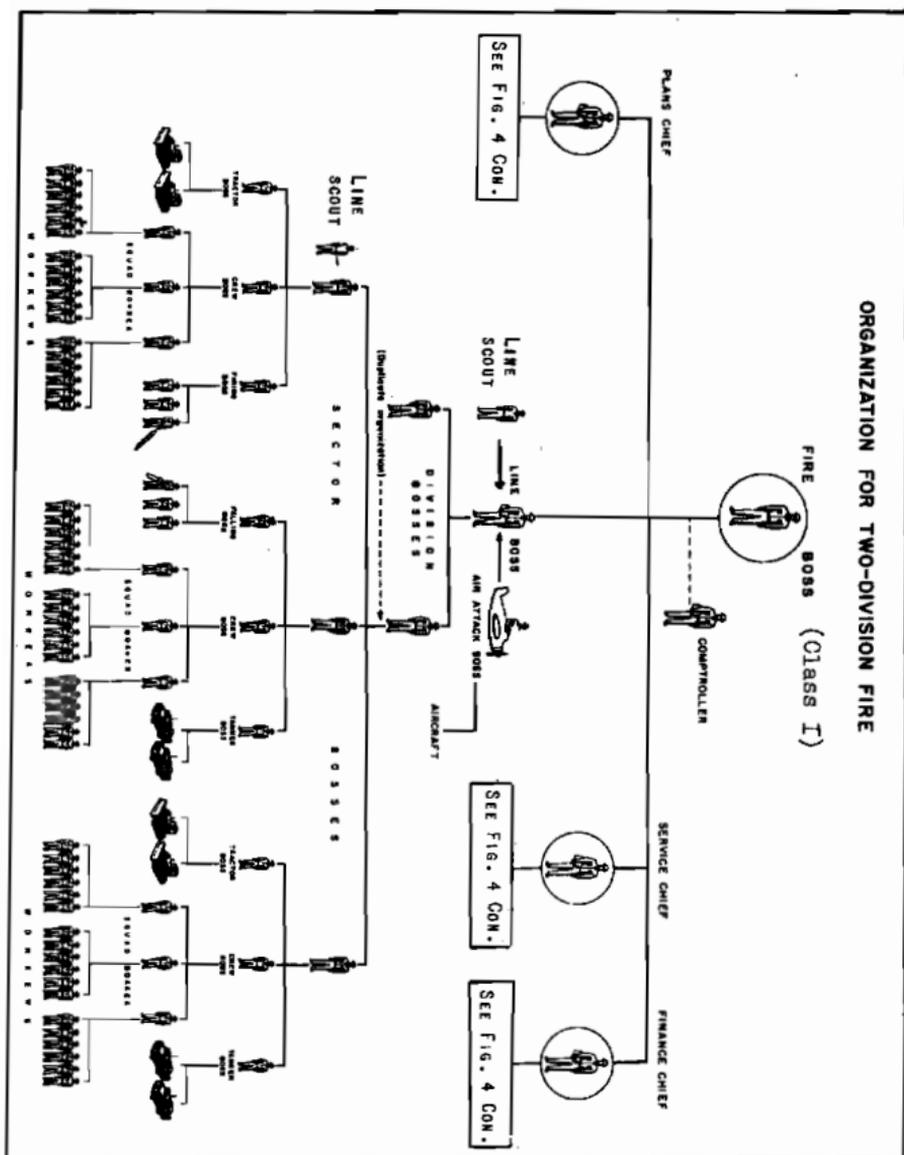


Figure 4

Organization for Two-Division Fire (Figure 4). Normally a two-division fire has 370 line workers per shift or comparable units of equipment and crews.



ORGANIZATION FOR TWO-DIVISION FIRE
 FIRE BOSS (CLASS I)

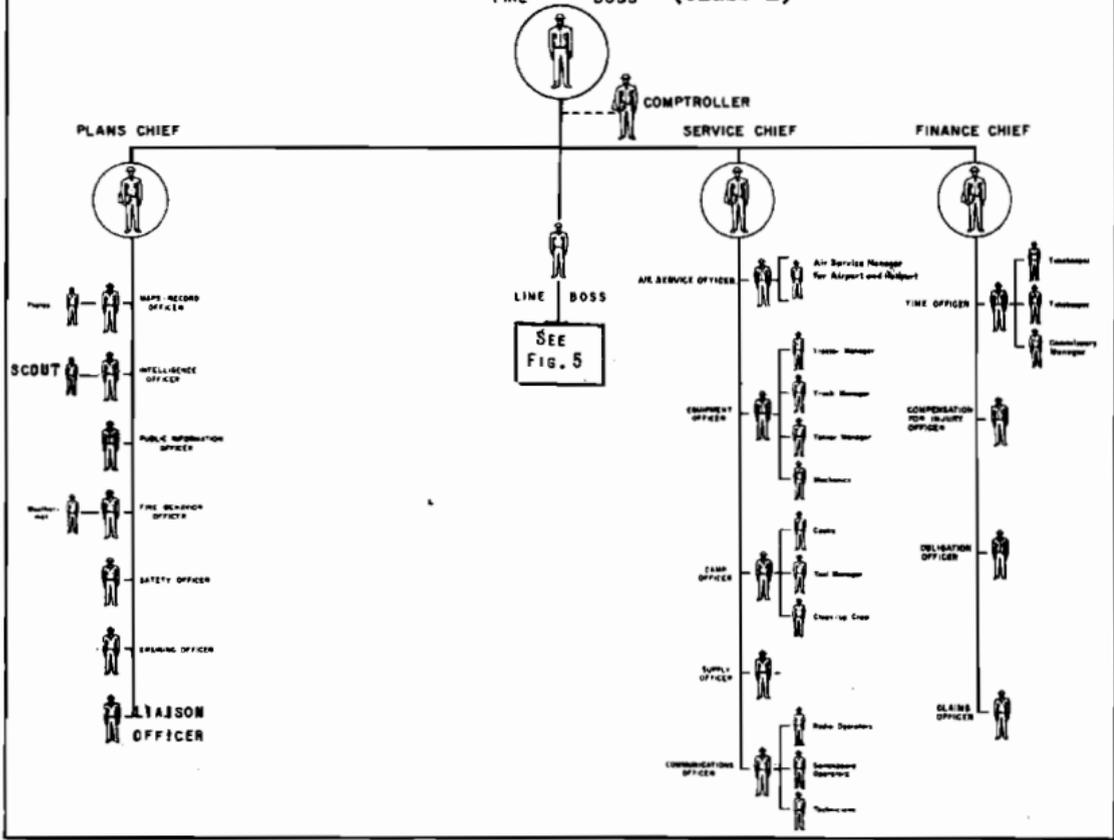


Figure 4--Continued

Figure 6

Zone Fire (Figure 6). Due to large size, geographic location, or other complexities, fires are sometimes best managed by dividing the perimeter into two or more zones.

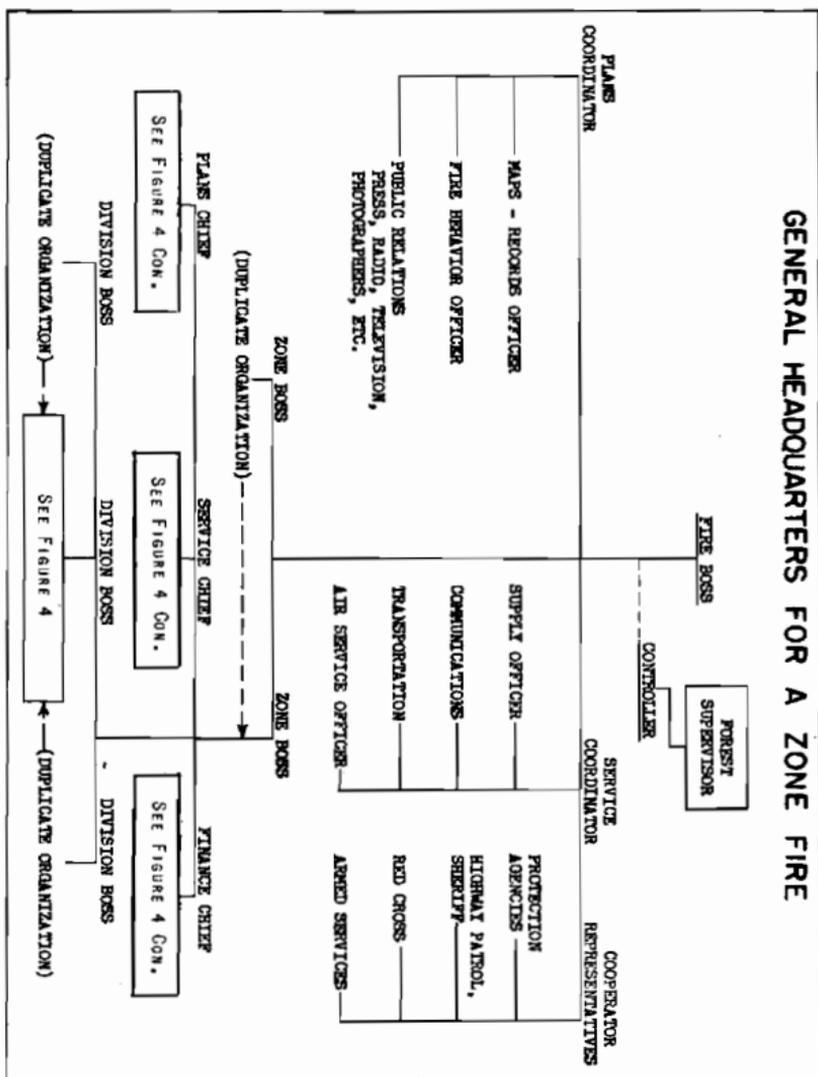
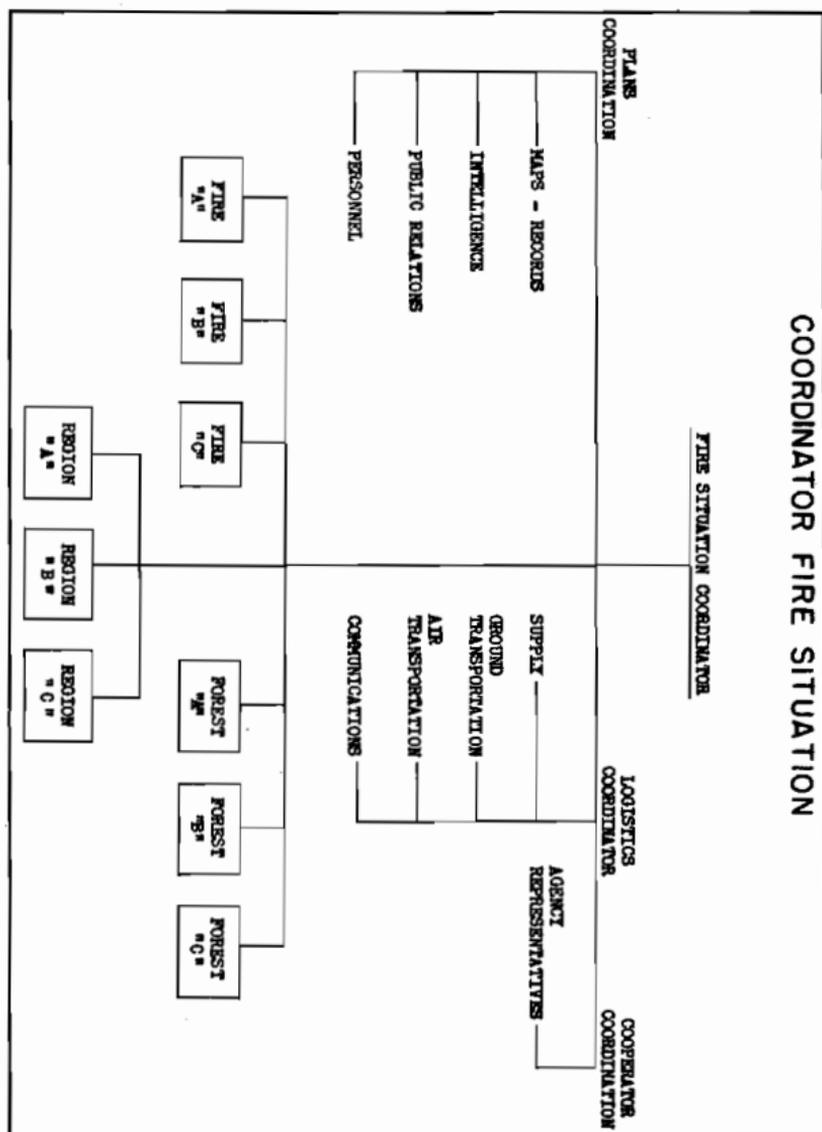


Figure 7

Coordinator Fire Situation (Figure 7). When a Forest or Region has an unusual number of fires at one time or where large fires have depleted firefighting resources, there is usually need for a high degree of coordination and establishment of priorities beyond the responsibilities of the dispatching units.



PART IV - FIRE JOB DESCRIPTIONS

Fire job descriptions have been assigned with a view to uniformity while preserving traditional and commonly accepted jobs. Nation-wide use of these fire job descriptions is necessary to ensure Service-wide understanding.

Firefighters having line or tactical authority are called bosses. The heads of the plans, service, and finance sections are called chiefs. Personnel reporting direct to chiefs are called officers. Personnel reporting to officers are called managers, with some exceptions as timekeepers, cooks, photograph interpreters, line scouts, line locators, and line inspectors.

A functional table of most fire jobs follows:

Fire boss (1)

Comptroller (2)

<u>Line descriptions</u>	<u>Plans descriptions</u>
Line boss (3)	Plans chief (16)
Air attack boss (4)	Maps-records officer (17)
Air tanker boss (5)	Intelligence officer (18)
Helicopter boss (6)	Aerial-photograph interpreter (19)
Division boss (7)	General scout (20)
Sector boss (8)	Fire behavior officer (21)
Crew boss (9)	Meteorologist (22)
Squad boss (10)	Public information officer (23)
Tractor boss (11)	Safety officer (24)
Tanker boss (12)	Liaison officer (25)
Felling boss (13)	Training officer (25a)
Line locator (14)	
Line scout (15)	
India: liaison officer (15a)	

<u>Service descriptions</u>	<u>Finance descriptions</u>
Service chief (26)	Finance chief (37)
Camp officer (27)	Time officer (38)
Air service officer (28)	Compensation-for-injury officer (39)
Air-service manager for airport and heliport (29)	Obligation officer (40)
Mixmaster (30)	Claims officer (41)
Equipment officer (31)	Timerecorder (42)
Tractor manager (32)	Commissary manager (43)
Truck manager (33)	
Tanker manager (34)	
Supply officer (35)	
Communication officer (36)	

All fire job duties and responsibilities will follow this general form:

1. Job title.
2. Reporting directions.
3. General responsibilities.
4. Specific duties.

1 - Fire Boss

The fire boss is responsible to the line officer (District Ranger, Forest Supervisor, or Regional Forester) making the assignment to the fire. He has full authority and responsibility for managing the fire control operation within the framework of legal statute, current policy, and broad direction which the line officer may provide.

His primary responsibility is to organize and direct the fire organization for efficient and complete control of the fire.

1. The responsibilities of the fire boss before arrival at the fire:

a. Obtaining the best available information on the location of the fire, the forces and equipment being sent, and current and forecasted weather conditions.

b. Usually traveling to larger and more complex fires by a route that will provide a vantage point for sizing up the fire and the adjacent country. Whenever feasible, when complex fires are involved, he will make this observation from an aircraft.

2. The responsibilities of the fire boss on arrival at the fire:

a. Determining probable spread by time periods on small simple fires and probable spread during first burning period on more complex fires.

b. Determining the need for ordering a mobile fire weather forecasting unit.

c. Notifying the dispatcher of the adequacy of resources assigned to the fire; giving an estimate of the fire potential and the additional resources required.

d. Preparing a plan of control which will ensure the most effective and safe use of assigned resources.

e. Organizing resources on the fire according to his plan of control.

f. Assigning men and equipment on a priority basis as they arrive.

g. Directing and coordinating fire suppression for remainder of the shift or until the fire is controlled.

h. Keeping dispatcher informed of fire progress to the extent his line supervision duties permit.

i. Maintaining a communication schedule by assigning someone else to this job if line supervision prevents personal contact.

j. Prior to crew or sector organization, assuming the responsibilities of the crew or sector boss.

k. Organizing the line forces into crews, sectors, and divisions when required.

l. Organizing needed service and plans units.

m. The fire boss will be responsible for determining when fire shelters will be carried on the fire line. He will evaluate the need based on the following factors:

(1) Fires in fuels of extreme rates of spread.

(2) Fires in which hazardous fire behavior can be reasonably expected.

(3) When the buildup index and spread index indicate extreme burning conditions.

(4) When one of the above conditions is associated with steep terrain or other factors limiting rapid escape.

3. The responsibilities of the fire boss on the going fire are:

a. Determining strategy and tactical plan for control and issuing necessary orders to obtain manpower, overhead, equipment, and facilitating gear.

b. Deciding on use of off-shift or other available personnel to meet unforeseen or new situations.

c. Briefing line boss, plans chief, and service chief where employed. (Crew, sector, and division bosses are briefed and consulted by the fire boss on fires where they operate under his immediate direction.)

d. Conducting strategy meetings when appropriate.

e. Checking on and initiating action for the welfare and safety of all personnel.

f. Maintaining high level of performance.

g. Taking required action on all cases of personnel deficiency.

h. Anticipating need for and assigning work to functional assistants as needed. Prior to their arrival, performing the duties of all vacant positions in the direct channel of command.

i. Determining need for safety officer.

j. Seeing that functional assistants understand and complete their work within time limits and in accordance with plans.

k. Remaining in communication for emergency consultation, except for short periods. Designating an acting fire boss with full authority for decision when necessary.

l. By proper planning and delegation, obtaining sufficient rest. Seeing that subordinates obtain needed rest.

m. Visiting critical and potential problem areas personally.

n. Determining time when demobilization should start. Using organization channels. (The plans chief prepares release lists for fire boss approval. The service chief executes the plan, in coordination with the District, Forest, or regional dispatcher.)

o. Making performance ratings for personnel reporting directly to the fire boss. (Form R1-6130-2.)

p. The fire boss will hold a "hot fire line" critique and document as necessary prior to leaving the fire.

2 - Comptroller

The comptroller works under direct supervision of the Forest Supervisor, and in close correlation with the fire boss, finance chief, service chief, plans chief, and line boss on business and financial matters. He will counsel with these men and make sure that satisfactory business and financial management practices are being followed on all aspects of the fire.

This position will be activated as soon as it is determined the fire will be difficult to control and will require a project organization. The position should be filled early, along with other top overhead positions, to promote sound practices and avoid business management problems. The Forest administrative officer or administrative assistant will normally be assigned to this position and will function until he is certain that the business and financial aspects of the fire will be satisfactorily carried through to completion.

The duties of the comptroller are:

1. Reviewing all business management activities for compliance with legal and fiscal requirements and for efficient use of resources.

2. Reviewing the work of all fire positions having business management responsibilities for compliance with approved practices. Advising and assisting supervisory personnel in corrective action required for all situations that do not comply with proper financial management.

3. Attending planning sessions to provide legal and fiscal advice and keeping informed on planned control action.

4. Advising the finance and service chiefs on major business management problems requiring corrective action within their functions.

5. Keeping fire boss informed of general costs and suggesting ways to eliminate waste, duplication, and unnecessary expenditures.

6. Providing advice on legality of proposed agreements, contracts, and unusual transactions involving the expenditure of funds, use of materials, equipment, and personnel.

It will be necessary for the comptroller to maintain close contact with the service chief, finance chief, and plans chief as well as to observe the activities at spike camps, equipment pools, supply sources, heliports, and air-tanker bases.

It is the comptroller's job to provide a constructive service within his field. He is an adviser, instructor, inspector, and fiscal authority. He should call any pertinent matter to the attention of the responsible person.

Line Descriptions

3 - Line Boss

The line boss is directly responsible to the fire boss. This position is often the key to efficient use of firefighting resources. It should be filled whenever the size, complexity, or potential of the job makes it difficult for the fire boss to exercise direct control. If the fire boss must be away from the line frequently or for extended periods, he should assign a line boss. The line boss and his line overhead have but one responsibility: To direct field action to control the fire in accordance with the strategic and broad tactical plan of the fire boss and to see that work is accomplished with safety. He is provided with a job assignment which specifies the general location, time of completion and, in general terms, the nature of the work to be accomplished. He is informed of control forces, men, tools, specialized equipment, and overhead in organized units, and transportation, communication, and camp facilities available. He has latitude to make decisions within the limits of the plan given him.

The duties of the line boss are:

1. Organizing field forces on the fire in accordance with the plan of control provided by the fire boss.
2. Reviewing the plan of control with the fire boss, making such suggestions as he feels pertinent and requesting additional information as is necessary.
3. Briefing his line overhead for the next shift. Checking with each to make sure all points are fully understood. Such instruction includes:
 - a. Fire behavior and fuel peculiar to locale and blowup possibilities.
 - b. Location of work including alternate plan and division termini. If there are several divisions, location of sector termini should be handled by the division bosses. Sequence and timing of operation.
 - c. His whereabouts and means for his immediate line overhead to contact him during the shift.

d. Men and equipment assigned and its organization.

4. Keeping currently informed of conditions and progress on divisions or sectors assigned him, personally inspecting the more important ones at least once each shift. Inspection will cover the following points:

a. Is action being taken within time limits?

b. Are proper techniques used?

c. Are resources adequate as to number, type, and condition for the assigned job?

d. Are manpower and specialized equipment in balance, and are they properly organized and supervised?

e. Are sectors or divisions properly correlated?

f. Are plans and services adequate?

g. Are special problems that will carry over to the next shift identified, and is this information available for briefing the next shift?

h. Are surplus resources made available for redistribution or release?

i. Is intersector and interdivision equipment; such as, plows and bulldozers, properly shared?

j. Are control plans being followed?

5. Coordinating activities of all sectors or divisions and determining need for redistribution of resources to meet conditions as they develop and calling them to the attention of the fire boss. If need for redistribution is urgent and communication impossible, making adjustment and notifying fire boss at earliest moment.

6. Determining the disposition of planned reserves, calling them into action, as needed, without further clearance. Notifying the fire boss of action.

7. Coordinating activities of sector bosses or division bosses by radio, written message, or personal interview.

8. Participating in demobilization plans.

9. Making out performance ratings of immediate subordinates when required.

(Reserved for future use)

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4 - Air Attack Boss

The air attack boss is responsible to the line boss or a designated lineman; such as, an assistant line boss for air attack or a sector boss. The air attack boss should be of line-boss caliber, with working knowledge of aircraft, not subject to airsickness, and a capable aerial observer and mapper.

The duties of the air attack boss are:

1. Obtaining a suitable aircraft and pilot through the air service officer or from the chief pilot's approved list. Should have own aircraft as normally does not fly with air tanker boss.
2. Directing and supervising air attack operation.
3. Providing technical expertness and coordinating of tactical air operation.
4. Determining and activating requests for types and numbers of aircraft required.
5. Establishing priorities, coordinating use of airspace and enforcing Federal Aviation Agency (FAA) and Forest Service air regulations.
6. Determining airspace restrictions needed and initiating request to FAA as required.
7. Obtaining his retardant drop targets direct from the designated line overhead.
8. Maintaining radio contact with air tanker boss and directing placement of materials; such as, retardants, as ordered from the ground. In cases of radio deficiencies, directing tankers by visual signals but never at the expense of safety.
9. If assigned targets are beyond the capabilities of the aircraft, requesting secondary targets. In cases of communications failure with the ground, directing drop based on his own initiative and judgment.
10. From his vantage point, being alert to all factors affecting the control of the fire and making this information known to the line boss.
11. When not actively directing drops, optionally assisting in aerial reconnaissance and mapping.
12. Being alert to any factors that may affect safe, efficient operation.

5 - Air Tanker Boss

The air tanker boss works under supervision of air attack boss. He is responsible for supervising operation of air tanker airplanes in accordance with instructions from air attack boss.

The duties of the air tanker boss are:

1. Directing tanker airplanes to targets designated by air attack boss.
2. Designating the drop flight pattern for tanker airplanes.
3. Maintaining drop sequence and physical separation of tanker airplanes.
4. Alerting for unsafe and inefficient tanker operation and advising air attack boss or tankers direct action in extreme cases.

6 - Helicopter Boss

The helicopter boss works under supervision of air attack boss. He is responsible for supervising helitanker operation in accordance with instructions from air attack boss.

The duties of the helicopter boss are:

1. Directing helitankers to targets designated by air attack boss.
2. Designating the drop flight pattern for helitankers.
3. Maintaining drop sequence and physical separation of helitankers.
4. Alerting for unsafe and inefficient helitanker operation and advising the air attack boss or tankers direct action in extreme cases.

7 - Division Boss

The division boss is usually responsible to the line boss. His direct responsibility is the control of a designated division of a fire, including all phases of linework, backfiring, mopup, and patrol. He has full authority and responsibility for directing and supervising work on his division.

The span of control is three to four sectors. He should be able to cover the hot or troublesome sections of the fireline or fire

edge at a minimum of two times per shift using all available modes of transportation and walking.

This rule may be limited to one trip if critical sections demand his presence and remainder of the sectors are under reasonable control. He pays special attention to potential blowup conditions, line of retreat for crews, and safety areas.

He should not leave his division unless approved by his superior until he has thoroughly reviewed the conditions, problems, and accomplishments with the division boss of the next shift.

Division bosses are usually used on all fires requiring three or more sectors.

The duties of the division boss are:

1. Organizing field forces on his division in accordance with the plan of control provided by the line boss, or in some cases by the fire boss.

2. Adhering to the following units of authority and responsibility and performing the duties as indicated by the following representative list:

- a. Reviewing plan of control pertaining to his area with the line boss, making such suggestions as he feels pertinent on basis of personal knowledge of the fire and requesting such additional information as is necessary for his duties.

- b. Briefing his line overhead for the ensuing shift. Checking each to make sure all points are fully understood. Such instructions to include:

- (1) Fire behavior and fuel peculiar to locale. Particular note of blowup possibilities.

- (2) Location of work including alternate plan. Sector and division termini. Sequence and timing of operation.

- (3) Whereabouts and means for his immediate line overhead to contact him during shift.

- (4) Resources assigned and planned organization of the division and sectors.

3. Keeping currently informed of conditions and progress on his division and adjacent divisions. Will personally inspect work on troublesome sectors twice each shift. Inspection will cover the following points:

- a. Is action in accordance with time limits specified in control plan?

- b. Are proper techniques employed?
 - c. Are resources adequate as to number, type, and condition?
 - d. Do manpower and specialized equipment complement each other?
 - e. Are sectors properly correlated?
 - f. Are plans and services adequate?
 - g. Are special problems that will carry over to the next shift located, identified, and recorded for transmission to plans chief upon request and for review with personnel of the relief shift?
 - h. Are crew bosses receiving guidance and training from sector bosses?
 - i. Are surplus resources made available for redistribution or release?
 - j. Are intersector resources; such as, plows and bulldozers, properly shared?
 - k. Are strategic and general action plans being followed?
4. Coordinating activities of all sectors in his charge and determining need for immediate redistribution of resources to meet conditions as they develop and, if possible, calling them to the attention of the line boss. If need for redistribution is urgent and communication impossible, making adjustment and notifying line boss at earliest possible moment.
5. Determining the disposition of planned reserves, calling into action as needed without further clearance. Should, if possible, notify line boss of action.
6. Coordinating activities of sector bosses on his division by radio, written message, or personal interview to keep them assured as to correctness of action taken by them.
7. Participating in reduction of overhead organization on his division when job requirements permit combining of duties.
8. Seeing that subordinates; such as, sector boss and crew boss, can adequately handle timekeeping responsibilities.
9. Making out performance ratings of immediate subordinates when required.

8 - Sector Boss

The sector boss sets in motion and supervises the operations called for in the general action plan for his sector as outlined by division boss or line boss. He attains the progress and quality of performance necessary for suppression of the fire. He determines specifically the start and completion of individual operations on his unit, and guides, coaches, and assists crew bosses or sector specialists. He remains on his sector until specifically relieved.

The duties of the sector boss are:

1. Assigning specific functions or section of line to crew bosses or machine bosses. In making assignments he will:
 - a. Describe or point out, where possible, the location of the work.
 - b. Define the standard of performance; that is:
 - (1) Width of line or area to be worked.
 - (2) Time to start the operation.
 - (3) Time to complete the operation.
 - c. Define techniques to be employed as needed.
 - d. Explain the organization on the sector.
 - e. Describe special problems of the unit and define how they shall be handled.
 - f. Assist in organization of the crews to accomplish the job most expeditiously.
 - g. Specify arrangements for service facilities.
 - h. Specify arrangements for relief.
 - i. Specify safety precautions including line of retreat and treatment of injuries.
 - j. Specify location of and use of communication facilities.
 - k. Review off-shift responsibilities, time report, messaging, sleeping, first aid, and commissary. After assignment of personnel, will devote his energies to supervision of the crew bosses and their work. Inspection of work, training crew bosses, assisting crew bosses on unfamiliar activities and line location in advance of construction will be his major responsibilities.

2. Keeping division boss informed by radio or messenger, of progress on his sector. Anticipating problems requiring a change of the general action plan or assistance of the division boss and discussing these with the division boss. Calling attention of division boss to surplus or shortage of resources. May not make a shift in resources to change the strategy or general action plan of the sector without approval of the division boss except:

a. Where action of the fire forces abandonment of a portion of the line or requires unanticipated action; such as, control of a breakover or spot fire which cannot be handled as an individual problem.

b. The division boss, line boss, plans chief, or fire boss cannot be reached within allowable time limits for decision.

c. That such action does not jeopardize the safety of personnel or invalidate the action of adjacent sectors.

3. Remaining on his sector until relieved by replacement or by specific instruction of the division boss. When relieved, accounting for all resources assigned his sector as to location and general condition prior to actual departure from sector.

9 - Crew Boss

The crew boss is supervised by the sector boss or his assistant. He is responsible for the performance of his crew, their safety, and their welfare. He usually retains the same crew for the duration of the fire; hence has responsibility for them both on the line and off the line. He will remain on line until instructed by his superior officer to leave.

On-the-line duties of the crew boss are:

1. Explaining at the beginning of each shift:

a. The nature of work to be accomplished.

b. Expected duration of the shift.

c. Chain of command and who issues instruction.

2. Organizing the crew to efficiently accomplish specific tasks.

3. Locating and assigning individual tasks to squad bosses or crewmembers within the assigned section of line.

4. Explaining and/or demonstrating techniques of accomplishing the tasks safely and efficiently where crewmembers are inexperienced or unskilled; such as, providing current on-the-job training to ensure acceptable performance.

5. Stimulating squad bosses and crewmembers to attain quality and quantity accomplishment.

6. Providing first-aid treatment for minor injuries.

7. Frequently inspecting the area assigned to assure required standards of performance.

Off-the-line duties of the crew boss are:

1. Retaining his crew as a unit, keeping them so mobilized as to answer any request with his crew intact at any time.

2. Inspecting physical condition, clothing, and equipment of crewmembers prior to leaving and immediately after arrival at service base each shift. Taking such action as indicated to maintain crew in usable condition.

3. Preparing and maintaining time report in duplicate showing:

a. Names of crewmembers.

b. Timeslip number.

c. Origin of crew; such as, lumber company or Forest Service road crew.

d. Hours on duty.

e. Pay classification. Sending records officer a copy at the beginning of a shift and original at the end of the shift.

4. Supervising crew while being transported between fireline and service base.

5. Learning, from bulletin board or registrar, layout and routine of camp feeding, sleeping, commissary, sanitation, etc. Instructing crewmembers and keeping them under control.

10 - Squad Boss

The squad boss is supervised by the crew boss as a working leader of a small group, usually not more than six men. He is responsible for keeping men fully employed on jobs assigned to his direction by the crew boss.

Squad bosses may be used on all fires requiring more than six line workers.

The duties of the squad boss are:

1. Understanding exactly what the crew boss wants done.

2. Seeing that crew has first-aid kits, hardhats, files, and other necessities before leaving camp.
3. Seeing that men do a reasonable day's work.
4. Seeing that no effort is wasted on unnecessary work.
5. Keeping men well equipped with proper tools.
6. Showing men how to use and care for tools.
7. Helping crew boss in off-the-line and camp duties.
8. Assisting the crew boss in checking men out and in with the timekeeper.
9. Keeping a list of names of men and keeping time if requested by crew boss.
10. Looking after the safety of the men on the line.
11. Reporting lazy and incompetent men and agitators to the crew boss.
12. Observing and enforcing smoking rules.
13. Looking after safety of men during transportation.
14. Seeing that the men have lunches and water.

11 - Tractor Boss

The tractor boss is responsible to the fire boss on multiple-crew or smaller fires and to the sector boss on all other fires.

The duties of the tractor boss are:

1. Constructing the fireline as determined by his administrative superior.
2. Supervising and correlating the work of the dozers, plows, and personnel assigned to his operation.
3. Providing for the safety and welfare of equipment and personnel assigned to him.
4. Keeping time for all machinery and personnel under his supervision; checking it with operators and submitting to timekeeper.

5. Developing an on-the-spot understanding between the dozer (plow) operators and the dozer (plow) crews of the signals to be used in directing the operators. They should include such commands as "stop," "come ahead," "back up," "caution," "cannot see spotter," "turn left," and "turn right."

6. Arranging with immediate superior for relief of operators and other members of his crew or crews.

7. Making arrangements with equipment officer for the proper servicing and maintenance of the machines for fuel and lubrication, with a minimum loss of time.

8. Informing immediate superior of any breakdowns. Informing him of progress made and when the job is finished. Avoiding long and unnecessary idleness of equipment.

9. Being alert to the following good management practices when using equipment:

a. When working close to the fire, avoiding carrying fire outside the line. Pushing hot burning logs and stumps into the burn away from the line.

b. Not allowing operator to bury fire or leave "dozer piles" within the burned area. Scattering or removing them, as they may hold fire for weeks and cause the eventual loss of the fire.

c. Taking advantage of favorable fuels and topography.

d. Keeping men away from the vicinity of the tractor or plow.

e. Advising all crewmembers of the hazards of the job and having adequate plans of escape to be used in event of a blowup.

f. When two or more dozers or plows are used as a unit or worked in tandem, seeing that they work far enough apart for safe operation. Likewise, that they do not become so widely separated that they cannot be communicated with.

g. Breaking long-sustained grades on the fireline in order to avoid excessive erosion.

h. Personally supervising loading and unloading of tractors and other heavy machinery when possible.

i. Reporting completion of assigned job to immediate superior.

12 - Tanker Boss

The tanker boss is responsible to the fire boss on a fire below the sector stage and to the sector boss on other fires for efficient use of tankers or pumpers. This job requires a man who is not only familiar with fire behavior, but also skilled in the correct use of water and hose lays in direct attack on fires and conservative use of water in mopup. He must be familiar with the operation and maintenance requirements of various types of pumpers.

The duties of the tanker boss are:

1. Assigning tankers or pumpers to designated locations.
2. Supervising and correlating the work of tankers and personnel assigned to him. Each tanker crew foreman should be given specific instructions as to where and what his assignment is; such as, hotspotting, working hot line, mopup, cooling off around snags for fallers, or assistance in backfiring.
3. Coordinating work of tanker and hand crews in same area; for example, tanker crew will work hot line and cool off flames, with hand crew assisting in hose pulling and actual line construction behind tanker crews. Hand crew will turn, stir, and scrape smoldering material for hose crews in mopup work.
4. Informing immediate superior as to approximate location of tankers that can be called upon in emergencies for assistance on slopovers and spot fires.
5. Instructing tanker crew foreman to be on alert for spot fires, giving immediate attention to them, and standing ready to assist adjacent crew bosses who might call for help in emergencies.
6. Advising immediate superior of changes in location of tanker equipment.
7. Knowing principles of water use in fighting fire.
8. Working with tanker operator giving any necessary training in proper use of water and seeing that necessary training is given to the crew.

9. Giving special emphasis in training in use of water to volunteer or pickup crews assigned to tankers and to crews on cooperator tankers.
10. Informing tanker crew foreman of tanker refill locations, or arrangements for refill by mother tankers.
11. Making arrangements and issuing instructions for correlation of tanker crews for progressive hose lays, uphill water relays, and other more complicated arrangements.
12. If necessary, assisting tanker crew foreman in developing an understanding between tanker operator and crew on hand signals to be used.
13. Checking with immediate superior on arrangements for relief crews for tankers.
14. Checking with tanker operators to be sure tankers are properly serviced and properly operated. Checking especially when operated by pickup, cooperative, or relief crews.
15. Checking with immediate superior, and service chief or equipment officer, on arrangements for supply and delivery of fuel and lubricating oil.
16. Checking on availability and use of proper equipment, fittings, nozzles, and hose on tankers.
17. Informing his superior immediately of any tanker breakdowns.
18. Informing superior of progress on assignments and completion of assignments.
19. Providing for safety and welfare of equipment and personnel assigned to him.
20. Advising tanker crew foremen of hazards of the job and having adequate plans of escape for a blowup.
21. Keeping and submitting time to timerecorder for all equipment and personnel under his supervision.

13 - Felling Boss

The timber-felling boss works under supervision of the fire boss on all fires below the sector stage, under the sector boss on other fires and is responsible for the work of men and equipment assigned to him. This is a highly specialized job requiring the

services of a man who is not only familiar with fire control requirements but knows the mechanical operation of powersaws and the job of felling timber. The work may consist of partial cutting of logs in front of a tractor, cutting logs for hand or plow-line construction, or felling snags prior to burning operations or in mopup operations.

The duties of the felling boss are:

1. Familiarizing himself with the basic plan of control on his assigned sector or sectors.
2. Coordinating the felling operations of his crew or crews with the work of other crews and machines to avoid endangering these facilities and unnecessary delays.
3. Upon advice from his immediate superior, determining priority of work, selecting snags or snag area most dangerous to control for immediate removal, and width of strip to be worked, etc.
4. Supervising and coordinating the work of felling crews assigned to him.
5. Reporting currently to his immediate superior, keeping him informed of progress.
6. Seeing that arrangements are made for the shifting or release of saw crews no longer needed in the operation.
7. Knowing the safety requirements and seeing that saw crews adhere to them.
8. Keeping correct time reports for fellers' time and power-saw operation. Checking time with operators to be sure they are in agreement.
9. Seeing that arrangements are made for relief or replacement of crews when long shifts are evident.
10. Arranging for proper care, maintenance, and service of saws.
11. Reporting to immediate superior upon completion of assigned job.

14 - Line Locator

The line locator is needed when fuel, topography, and visibility conditions are such that tractor or handline production is held up because of lack of advance fire edge or ground information.

He works under the direct supervision of and is responsible to the sector boss for on-the-ground location of the fireline to be built. It is important that the line locator be thoroughly familiar with:

1. Fire behavior and line location techniques.
2. What can be expected of the various kinds of equipment available.
3. What can be expected of those for whom he is locating.

The duties of the line locator are:

1. Familiarizing himself with the general plan of control on the sector or sectors he works. Notifying sector boss when end of sector is reached so fire boss, line boss, or division boss can be informed.
2. Locating and marking route to be followed far enough in advance of operation so that if changes are necessary they can be made before the crews reach the questionable location.
3. Selecting tractor-dozzer or plowline locations that can be traversed by the machine and will avoid:
 - a. Wet or soft ground.
 - b. Solid rock or extremely rocky ground.
 - c. Heavy snag and down-log areas.
 - d. Contouring on steep slopes.
 - e. Slopes requiring climbing in excess of that which can be negotiated by the unit being used.
 - f. Loose boulders on brushy slopes.
4. Keeping the sector boss on whose sector he is working currently informed of the progress he has made, difficulties to be encountered, etc.

Good practices for safety and efficiency:

1. Locating line as close to fire edge as possible consistent with burning conditions and strategy outlined by sector boss.
2. Avoiding snag patches and heavy down-log or slash areas if possible. Keeping these hazards outside of the area to be burned out.
3. Choosing route to make line construction as easy and rapid as possible, taking advantage of openings, bare areas, barriers, roads, and trails.
4. Avoiding as much undercut line as possible and locating line so rolling material will not cross.
5. Avoiding fingered line if possible.
6. Avoiding sharp angles in line.
7. Locating line sufficient distance from fire edge so it can be constructed and burned out before main fire reaches it. Taking into consideration fatigue factor of hand crews.
8. Locating line far enough from burning snags to catch most of sparks and to contain snag if it falls or is felled.
9. Taking advantage of normal daily shift between up-and-down canyon drafts.

15 - Line Scout

The line scout is responsible to the officer to whom assigned, fire boss, line boss, division boss, or sector boss, and is used when conditions are such that the line officer or fire boss cannot do advance scouting for his unit without detriment to his other responsibilities. He is used primarily on complex project fires when heavy timber, smoke, or topography limits the gathering of information to arduous foot travel, consequently limiting plans activities. He obtains full detailed information on location, condition, progress, behavior, and safety within and adjacent to his territorial assignment, and reports to the plans chief and/or responsible line officer.

Use when needed. This position on division-stage fires is usually attached to the division with assignment to sectors where services are needed.

The duties of the line scout are:

1. Obtaining available information and maps from plans chief before going to the fire.

2. Determining mode of communication and agreeing with line officer on communication schedule.

3. Reviewing coordinate system of reporting map locations.

4. Going to designated area ahead of control crews and marking route with rags or blazes as necessary. If acquainted with area, may guide crews to area.

5. Scouting ahead of control crews obtaining recording, and reporting currently:

a. Location and behavior of fire edge within assigned area--hotspots, etc.

b. Location, size, behavior, and potentialities of spot fires.

c. Fuel types and hazards in and adjacent to fire edge and spot fires.

d. Possible escape routes and safety areas for crews, if needed.

e. Possible routes to various parts of fire edge and spot fires.

f. Water chances en route.

g. Areas in which tractors, trenchers, or plows can be used.

h. Special small equipment needs.

i. Prevailing winds and slopes.

6. Upon request of immediate superior:

a. Acting as line locator ahead of crews.

b. Marking route to spot fires.

c. Directing small crews to spot fires.

d. Maintaining contact with adjoining units.

7. Knowing line locator's job description.

15a - Indian Liaison Officer

The Indian liaison officer is the official spokesman for his crew. He transmits messages from his crew to the proper authority and likewise transmits messages from proper authority to the crew leader.

The duties of the Indian liaison officer are:

1. Lives and works with crew, assuming responsibility for health, welfare, and safety of the crew.
2. Remains with his crew on the fireline.
3. Aids Indian crew leader in keeping men sober, on the job and on the bus or plane while en route to and from fires.
4. Arranges for meals in transit and engages transportation when scheduled means fail.
5. Checks crew for Forest Service identification card, for proper clothing and footwear, and for evidence of recent injuries.
6. Transmits all orders except those he considers to be unsafe or in conflict with established agreements. Protests such orders to official with higher authority than the person issuing the order.
7. Keeps crew informed of destination, fire name, location and agency, and other available information about the fire.
8. Checks time reports to assure correct preparation, checks in with the proper officials on arrival at the fire, checks his crew in and out of fire camp daily, and arranges for safe storage of luggage.
9. Assures that crews are briefed on work and safety.
10. Returns with his crew from the fire to the reservation. Completes compensation forms, if necessary, for any injuries and makes sure the user agency receives the completed papers.
11. Notifies Indian Agency of ETA of returning crews.

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(Reserved for future use)

Plans Descriptions

16 - Plans Chief

The plans chief is responsible to the fire boss for the collection and compilation of all data concerning the fire, calculation of probabilities, and control-force requirements. He collects and records data on resources assigned to the fire. The plans chief prepares instructions for line personnel based on the decisions of the fire boss. His responsibility includes maintenance of all management and administrative records for the fire:

1. Fire log.
2. Form R1-5130-1, Organization for Two-Division Fire.
3. Time records for his plans organization.
4. Weather and fire behavior records.
5. Record of crew and overhead arrival and departure.
6. Data for form 5100-29, Individual Fire Report.
7. Form R1-5180-2, Special Fire Report for Class C, D, and E Fires.
8. Daily map record of assignments.
9. Special narrative report, daily plan of action and progress by sectors.
10. Summary of personnel and special equipment.
11. Demobilization plan.

He is also charged to assign personnel, equipment, and tools to line units as specified by the fire boss.

The duties of the plans chief are:

1. Obtaining and compiling the following data concerning fire area:
 - a. Location of fire perimeter.
 - b. Behavior of fire on all parts.
 - c. Topography.

- d. Soil formations.
 - e. Types and density of cover.
 - f. Weather conditions, current and forecasted.
 - g. Access routes and rate of travel.
 - h. Status of control.
 - i. Possible campsites.
2. Calculating probabilities of the fire.
 3. Calculating control-force requirements and determining type of action most applicable within the limits of available resources.
 4. Preparing a statement of communication requirements for the line and planning units indicating frequency of contact and priority of installation.
 5. Maintaining a record of manpower, overhead, and special equipment showing:
 - a. Number.
 - b. Qualifications.
 - c. Identifications.
 - d. Location, on-shift, off-shift and where located.
 - e. Time in a work status.
 6. Preparing written instructions to line personnel on basis of fire boss decisions and instructions. Instructions to include:
 - a. Section of line assigned to each unit.
 - b. Time allowed for completion of control.
 - c. General action plan.
 - d. Pertinent information concerning adjacent divisions.
 - e. Alternate plan of control and steps required to place in effect.

f. Location of camps, radios, and other service facilities.

g. Map of fire or at least of assigned unit of fire.

h. Special explanation as needed to understand assignment.

7. Assisting fire boss in briefing line personnel.

8. Preparing or collecting information for administrative reports; such as, 5100-29, special narrative, and daily report (R1-5180-2), which includes obligations, and obtaining daily and cumulative fire cost estimates from finance chief.

9. Planning personnel needs of the plans unit. Organizing them and supervising their work. Preparing specific written instructions for these men as necessary.

10. Preparing demobilization plan considering:

a. Release of crews.

(1) Priority.

(a) Military.

(b) Cooperators from other Forests.

(c) Local cooperators.

(d) Project crews from other Forests.

(e) Local project crew.

(f) Special regional fire crews.

(g) Local special fire crews.

(h) Pickup firefighters.

(i) Indian crews.

(2) Notify District or Forest in adequate time to arrange transportation and provide necessary feeding en route to point of hire.

(3) Complete all compensation for injury forms.

(4) Complete all time reports to time of departure from fire camp.

(5) Schedule to avoid bottlenecks.

(6) See that detail rating forms (Rl-6130-2) are completed for overhead before leaving fire.

b. Release of equipment and vehicles.

(1) Priority.

(a) Military.

(b) Logger or contractor owned.

(c) Privately owned.

(d) Other Forest.

(e) Local leased or Government owned.

(2) Arrange transportation for heavy equipment.

(3) Inspect leased or rental equipment for damage.

(4) Complete time documents up to time equipment is released.

c. Release of aircraft.

(1) Priority.

(a) Military.

(b) Out of Region.

(c) Informal agreement.

(d) Contract.

(2) Complete all flight records and accounting of fuel bills.

(3) Take advantage of return to home base to return overhead, firefighters, etc.

(4) Provide ETA to home base.

d. Release of supplies and tools.

(1) Return surplus to Spokane or Missoula immediately.

(2) Return damaged or inoperable equipment as soon as possible.

(3) Keep inventory of equipment and supplies needed only to complete mop-up.

17 - Maps-Records Officer

The maps-records officer is responsible to the plans chief for collecting and compiling all data on resources available for control of the fire, performing all clerical duties in connection with instruction preparation, and preparation of all administrative records on control of the fire. He should use to the fullest extent possible the records of others but will initiate such action as is necessary to secure a complete set.

The duties of the maps-records officer are:

1. Acquainting all personnel, as they arrive in camp, of camp routines and layout. The bulletin board can be used for this purpose.

2. Preparing written instructions on the basis of rough draft or verbal instructions.

3. Preparing shift-organization map showing disposition of resources. Cross-referencing to job instructions and organization charts.

4. Collecting and summarizing pertinent material from officers in the service function immediately prior to each planning session.

5. Preparing a chronology of fire action currently, appending copies of maps prepared by the intelligence officer showing perimeter of the fire and status of control by 12-hour periods.

6. Preparing a summary of the situation similar to the 2000 report (R1-5180-2) each 12-hour period.

7. Assembling all regular administrative reports concerning the fires.

8. Determining personnel and equipment needs for the records unit.

9. Organizing and supervising subordinate personnel.

18 - Intelligence Officer

The intelligence officer is responsible to the plans chief for gathering all information concerning the fire area. This information covers all points on the scout reminder list, plus any specific information requested by the plans chief. Information must be in the form needed for easy analysis and within time limits established for the particular fire. He will determine the requirements of his own organization including personnel, facilities, and service and provide the necessary supervision and guidance to ensure adequate performance.

The duties of the intelligence officer are:

1. Establishing and designating key points on line and signing access routes into such points. Preparing map showing these data.
2. Determining method of scouting and/or line inspecting by foot, horse, airplane, or car.
3. Placing order for needed transportation for himself and subordinates.
4. Determining size of scouting and/or line inspecting job and dividing fire area into scouting units.
5. Assigning personnel to complete the job in time allotted.
6. Preparing and issuing instructions to scouts and line inspectors. Instructions to include:
 - a. Area assigned.
 - b. Data to obtain. (See scout reminder list.)
 - c. Method for recording.
 - d. Time and method of communicating data.
7. Securing and assigning necessary facilities for doing scout or line inspector job (compass, Abney level, rule, protractor, map sheets, and photographs).
8. Receiving all scout and/or line inspector reports direct. Recording data on master scout record. Such record to show location, character, time of observation, and magnitude of findings. Will include current accomplishments and anticipated accomplishments by end of current shift.

9. On controlled lines, preparing map of line showing location of special hazards.
10. Preparing map of areas needing special spot-fire attention.
11. Scouting personally where time and size of job permit, and in any event, to sufficiently permit intelligent analysis of scout reports.
12. Making contact with line personnel and securing their opinion on:
 - a. Manpower requirements next shift.
 - b. Tools and special equipment next shift.
 - c. Problems needing special attention.
 - d. Best point for distribution of next shift and point for pickup of present shift.
13. Locating possible campsites and preparing map of access route.
14. Locating and mapping unburned islands.
15. Securing data on construction rates.
16. Preparing map of fire by 6-hour periods.
17. Securing data of values, houses, fences, etc., that may affect control plan.
18. Preparing photograph maps on fire area showing perimeter and other pertinent information; such as, roads, streams, ridges, and spot fires.

19 - Aerial-Photograph Interpreter

The aerial-photograph interpreter is skilled in aerial-photograph interpretation and puts aerial photographs to their fullest use in fire control activities. Responsible to the intelligence officer and works with the fire boss, plans chief, and assists general scout and records officer in obtaining information from aerial photographs, which they might overlook or be unable to interpret themselves. He may also perform duties of the general scout, if qualified.

Employ only as needed.

The duties of the aerial-photograph interpreter are:

1. Seeing that adequate aerial photographs are obtained to cover fire area and area which probably will be burned, based on predictions of fire boss or plans chief.
2. If not enough sets of aerial photographs are available, making recommendation to immediate superior on number of sets needed and where available.
3. Obtaining as much information as possible from aerial photographs to reduce necessary ground scouting. Obtaining, recording, and mapping such information as:
 - a. Cover type, fuel density, and hazards; such as, snag and slash areas, improvements threatened, or in the path of the fire; such as, buildings, power and telephone lines, and bridges.
 - b. Location of natural barriers; such as, rock slides, streams, and bare areas which might be used as control lines.
 - c. Location of ridges or other likely control lines, showing steepness of slope, cover, soil conditions--indicates whether there are barriers to tractors; such as, steep slopes and rocks.
 - d. Location of canyons and ravines possible for control lines or indicates if canyons or ravines are too steep or narrow to be used for control lines.
 - e. Location of features not shown on available maps; such as, trails, roads, streams, springs, and reservoirs.
 - f. Location of possible campsites, aerial-drop areas, and helicopter landing spots.
 - g. Easiest possible routes or safety areas for crews.
 - h. Location of secondary control line and backfire lines.
4. In absence of general scout, accurately plotting location of fire edge, spot fires, and unburned islands from the air. If aircraft are not available, scouting and plotting from the ground.
5. Assisting records officer in preparing simple maps from aerial photographs for use on the fire.

6. Aiding in briefing line personnel on cross-country routes to their part of the line, especially when existing maps are in error.

7. After fire is over, assisting in making damage appraisal estimates; such as, burned area of timber, brush, or grass.

20 - General Scout

The general scout reports to the intelligence officer. Used primarily for aerial scouting alternating with intelligence officer. Does ground scouting when planes or helicopters unavailable, or when heavy timber, smoke, fog, or topography make aerial scouting unsatisfactory. Person assigned as general scout should, whenever possible, be a local Forest officer or a local person trained in scouting.

Employed only as needed. When intelligence officer is employed, the scout is responsible to him; otherwise to whom assigned.

The duties of the general scout are:

1. Receiving assignment and reviewing plans with immediate superior.

2. Flying over fire area, if possible, before scouting on the ground.

3. Studying aerial photographs, topographic maps, and administrative maps before going to fire. Securing data from aerial-photograph interpreters when employed.

4. Getting as much information as possible regarding area to be scouted from local residents, local Forest officers, line scouts, and linemen already on the fire.

5. Determining mode of communication and agreeing with immediate superior on communication schedule.

6. Agreeing with immediate superior on coordinate system of reporting map locations.

7. Using transportation that best suits the job; such as, helicopter, pickup, horse or foot. For detailed information, ground travel is essential.

8. Scouting ahead of control crews obtaining, recording, mapping, and reporting as scheduled to his immediate superior:

- a. Location and behavior of fire edge, hotspots, etc., whether smouldering, creeping, running, or crowning.
- b. Location, size, behavior, and potentialities of spot fires.
- c. Fuel types, understory or ground fuels, and hazards; such as, snag areas and slash areas in, adjacent to, and ahead of main fire and spot fires.
- d. Any improvements such as buildings, power and telephone lines, and bridges threatened or destroyed by the fire.
- e. Weather conditions; such as, wind, temperature, and humidity, encountered on ridges, slopes, and canyon bottoms, as well as moisture condition of fuels whether wet, damp, or dry.
- f. Indicate whether streams can be crossed on foot or by tractor.
- g. Location of any features not shown on maps; such as, trails, roads, streams, springs, improvements, or barriers.
- h. Location of possible campsites, aerial-drop areas, and helicopter landing spots.
- i. Location of ridges or other likely control lines, showing steepness of slope, cover, and soil condition; indicating whether there are any barriers to tractors; such as, rocks or steep areas.
- j. Location of streams, canyons, or ravines, possible for control lines. Indicate if canyons are too narrow and steep to be used for control lines.
- k. Indicate any special equipment needs.
- l. Possible routes to various parts of fire edge or spot fires.
- m. Possible escape routes or safety areas for crews, if needed.
- n. Report location of crews and tractors encountered, progress of line construction, held line, controlled line, and line enclosing unburned fuels.

9. Reporting immediately:

a. Any condition needing immediate attention; such as, fire endangering a crew, buildings, bridges, power or communication lines or threatening to cut off routes of travel or trap travelers on highways or roads.

b. Any threat or condition which might be remedied through immediate attention and prevent excessive work later; such as, spot fires far ahead of main burn, a hotspot threatening to cross a road or get into a snag area or slash area.

In extremely rough or hazardous country, scouts should work in pairs.

21 - Fire Behavior Officer

The fire behavior officer is responsible to the plans chief. Such a person is usually used on all fires having serious potentials; such as, fires in fast-burning fuels; where structures or other values complicate line location and timing; burning during high fire danger; burning on steep terrain; fires during critical wind conditions; or combinations of the above. He may be employed on relatively small fires having the above potentials.

The job of the fire behavior officer is to serve the plans chief in identifying unusual fire hazards and risks that may exist because of weather, fuel, topography, or a combination of these. He must assure himself that suppression forces are aware of the situation or condition. This information may be transmitted direct to the leaders on the ground, through organization channels, or in briefing sessions.

The fire behavior officer should consult frequently with such men as the fire-weather officer, the fire boss, plans chief, line workers, aerial patrol, experienced local men, and fire-research specialists. He should attend fire-planning and strategy meetings. He should advise the fire boss and plans chief of likely changes in fire behavior. He should bring to their attention any planned line location that he believes unsafe because of probable fire behavior.

The fire behavior officer should check critical sectors of the fireline to ensure that the men are following planned strategy; are working under safe conditions; have adequate communication and lookouts; and will get the job completed before their position becomes untenable. He should recommend changes in strategy where unsafe conditions prevail, either through channels or directly with suppression forces if the threat is imminent. Direct action

will be taken by the fire behavior officer only when an emergency situation is identified and communication channels are not available or when time does not permit delay. Ordinarily, all communication will be through regular organization channels.

The person selected for the position should be well acquainted with fire behavior in similar fuel types, terrain, and weather conditions. He should be the most experienced man in fire behavior available and, if possible, should be a local man.

The duties of the fire behavior officer are:

1. Stations himself where critical sectors of fire may be observed during burning period. Maintains communication with fire headquarters.

2. Obtains humidity and wind measurements from one or more points on the fire hourly, preferably from high and low elevations of fire.

3. Prepares a fire behavior outlook by sectors, revising currently and notifying fire boss.

4. Secures spot weather forecasts from the meteorologist as needed each day.

5. Takes action through channels to warn endangered personnel when an emergency situation is identified. If normal channels are not available, takes necessary direct action to alert line personnel.

22 - Meteorologist

The meteorologist is responsible to the plans chief or fire behavior officer for furnishing fire-weather forecasts necessary for planned control of the fire. He will be expected to furnish the fire behavior officer and others needing such information, the more detailed microclimatic forecasts essential to safe, effective operations. It is important that he be a trained meteorologist who has specialized in fire weather.

The duties of the meteorologist are:

1. Obtaining from the plans chief or fire boss the current fire situation and geographic possibilities for final control. Establishing fire-weather stations or providing portable stations for use within this area.

2. Taking regular measurements of local fire weather at these locations.

3. Securing continuing broad and local weather patterns and trends which will affect the fire weather.

4. Working with the fire behavior officer in interpreting these patterns and trends and furnishing the forecasts indicated in the introduction above.

5. When assigned, providing on-the-line forecasts for specific fire operations such as backfiring.

23 - Public Information Officer

The public information officer is responsible to the plans chief for disseminating factual information about the fire and associated activities of the Forest Service and cooperating agencies or groups. He will represent the plans chief in contacts with the fire boss and Forest Supervisor on matters within his field. Primary objective is to facilitate the gathering and release of accurate news-story material. In doing this, he will relieve fire-control personnel and dispatchers from the pressures often imposed by news media and the general public.

The duties of the public information officer are:

1. Setting up an information center to which all requests for news and information about the fire can be channeled. This should be a commercial phone center removed from fire traffic messages.

2. Notifying local news media of the number to be called and hours the service will be provided. Contacting city editors of newspapers or news directors of radio and television stations if an individual contact is unknown. Knowing their deadlines.

3. Preparing roughdraft stories as soon as possible, based on 2000-report facts and supplementary information from dispatcher, fire boss, and plans chief. He is alert to unusual incidents or facts that will provide a story lead. Fire facts alone will not make good news stories. Assembling fire information so that one or several of the elements that make news is included, for example; drama, oddity, consequence, or progress.

4. Arranging for a report from the fire every 2 to 4 hours when news developments are in a high state of change.

5. Maintaining a fire progress map on a Forest Service base or Geological Survey topographic base.

6. Arranging for a monitor radio receiver on the fire frequency, if possible.

7. Planning to visit fire camp or fire strategy sessions once or twice each day so he can benefit from firsthand observation and make statements attributed to individuals responsible for control of fire.

8. Arranging to personally conduct reporters and photographers when on-the-line coverage is desired. Obtain photographs and slides to meet media needs and serve I&E purposes. A well-informed assistant can greatly reduce demands on fire-staff time for lengthy interviews and quotes.

9. Preparing to handle tape-recorded interviews by telephone or in person on request from radio and television; also, television live coverage on the fire.

10. When desirable, preparing a short, factual report to telephone to the dispatcher.

Following is the usual order for reporting a fire story to newspapers:

1. Name of fire.
2. Where it is.
3. When it started.
4. Who is responsible for control.
5. Who is directing control.
6. Who is cooperating.
7. How it started, if known. Caution here is recommended.
8. Fire action--give number of men, tractors, tankers, airplanes, and helicopters on the fire.
9. Cost to suppress to date, damage estimate to date. Wild guesses should be avoided.
10. Estimated time of control. This should always come from the fire boss directly or through the plans chief. The fire boss should not be second-guessed.
11. Weather forecast in relation to control.

12. Injuries, terrain, cover, specific property losses, aerial support, and other related activities of public interest.

The public information officer must use imagination, as each fire situation requires much improvisation for getting the news out. Immediacy is a primary element in fire news. Courteous and helpful information service is a must in meeting Service obligation as a public agency. A public information officer must work closely with cooperating agency heads. He should see that they get proper coverage and credit.

24 - Safety Officer

The safety officer is used on fires requiring a large fire organization. The need for a safety officer on less complex fires will depend upon the experience of personnel used and hazardous conditions involved; such as, rough terrain, snag areas, and fire potential. He is responsible to the plans chief. He must have fire experience and a thorough knowledge of fire safety hazards and how they are removed.

The safety officer may represent the plans chief in keeping the fire boss currently informed of any action needed to prevent accidents. He is essentially a safety inspector and investigator.

The duties of the safety officer are:

1. Surveying major hazards in connection with fireline, fire camp, transportation of men, and other fire activities and making recommendations on how to remove or reduce the hazards.
2. Checking and reporting on availability of facilities to handle minor injuries, and on such arrangements for taking care of serious cases as doctors, ambulances, hospital rescue services, and Red Cross disaster units. Coordinating this information with compensation-for-injury officer and camp officer.
3. Checking and reporting on compliance with Forest Service safety code, and use of preventive equipment such as safety guards and hardhats.
4. Checking and reporting on laborers physically unfit for their jobs.
5. Checking and reporting on welfare, sanitation, and safe drinking water. Checking on kitchen personnel, sanitary conditions, and food.
6. Investigating and reporting on serious accidents unless relieved of this duty.

7. Arranging for emergency first aid when it is required.
8. On fires of several days' duration, maintaining safety bulletin board and distributing safety materials.
9. Providing safety advice in strategy planning.
10. Assisting and advising fire overhead in on-the-ground safety training.

This position does not relieve the service chief, camp officer, or finance chief of their responsibility for having adequate first-aid facilities in camps and on the line, operating first-aid stations for treatment of minor injuries, arranging for treatment of more serious cases by regular physician, and preparing forms. Neither does the position undercut or affect in any way the safety authority and responsibility of any line officer.

25 - Liaison Officer

The liaison officer is responsible to the fire boss or plans chief. He acts as liaison between the Forest Service and the cooperating agency. The job is filled when the contacts with cooperators become too burdensome for the fire boss to handle. The liaison officer may be requested to report directly to the fire boss and act as coordinator between the fire boss and the agency to which assigned. He must be familiar with Forest Service policies and procedures and well versed in all aspects of fire suppression activities. He must understand the cooperative agreements, state laws, policies and procedures of other agencies.

In close contact with the cooperating agency, the liaison officer will:

1. Keep posted on the plan and control progress of the fire.
2. See that radio and telephone communications are installed.
3. Keep currently informed as to needs and requirements such as aerial photographs, maps, organization charts, manpower, and equipment summaries.
4. Relay all requests for additional manpower and equipment to the fire headquarters.
5. Keep the fire headquarters informed of all surplus manpower and equipment available for reassignment.

6. Acquaint himself with the quantities of men and equipment provided by the cooperator, reporting such information daily to the headquarters plans chief.

7. Inform the cooperating agency of time and place of joint strategy meetings.

8. In general, serve as a connecting link between the agencies involved in control of the fire.

25a - Training Officer

The training officer is responsible to the plans chief. This position is filled when trainees are sent to a fire and training needs indicate the need of the training officer. The position should be filled by an individual well-grounded in all fire functions.

The duties of the training officer are:

1. Receives all trainees and sees they are properly oriented and assigned.
2. Keep in touch with trainees during length of this assignment.
3. Assists in performance evaluation.
4. Assists plans chief in orientation, briefing, and refresher training in specific fire job duties.
5. Conducts on-the-job training as requested by plans chief.

Service Descriptions

26 - Service Chief

The service chief works under supervision of the fire boss. He is responsible for furnishing facilities and services called for in the plan of control for the fire. Such services and facilities include communication, transportation, supply, and camp management in the proper amounts at the required time and place.

The duties of the service chief are:

1. Establishing, maintaining, and operating fire camps, assigning and supervising personnel needed to operate the camps. Ordinarily obtaining information from plans chief on camp location, but may independently plan the camp locations needed for service

of the line. When independent plan is made, review by fire boss, plans chief, or line boss will precede establishment of camps.

2. Furnishing men, tools, and specialized equipment as ordered. Anticipating requirements in general terms. Determining rations, bedding, and transportation requirements and obtaining or having such items available when needed.

3. Obtaining, servicing, and operating a transportation fleet, including aircraft, to transport men, supplies, and equipment. The size and character of the fleet are ordinarily determined by the service chief from an analysis of the control plan and anticipation of transportation requirements.

4. Establishing, maintaining, and operating a communication system that will provide adequate and continuous service for all functions of the fire organization.

5. Upon receipt of the planned line organization, organizing and dispatching crews and equipment in accordance with instructions. Is responsible for the line forces until delivered to the place and/or person called for in the instructions.

6. Determining the organization, equipment, and supplies requirements of the service unit.

7. Determining source, quantity, and type of resources available for assignment to the operations.

8. Determining, through consultation with dispatching agency and the fire boss, a priority of release for manpower and equipment. Arranging for prompt processing and transportation to destination.

9. Supervising the work of equipment officer, air officer, supply officer, communication officer, and camp officer.

10. Provides first-aid facilities, and transportation for sick and injured to doctors or hospital.

27 - Camp Officer

The camp officer is responsible to the service chief for the establishment and operation of a base operation. He is furnished with the location, general requirement, and time schedule.

The duties of the camp officer are:

1. Planning the detailed layout and setting up the base.

2. Organizing and supervising subordinate personnel.
3. Specifically designating and making assignment to sleeping areas. Providing sleeping areas for proper segregation of personnel; quiet; and the maximum amount of shade for day sleepers.
4. Providing the men with proper sanitary facilities within the limits of available resources.
5. Providing for a safe water supply.
6. Organizing and scheduling the feeding of personnel to meet the requirements of the control plan.
7. Establishing an assembly area and providing warming fires, bulletin board, and similar facilities as needed.
8. Establishing and operating a first-aid station for treatment of minor injuries. Arranging for treatment of more serious cases by a regular physician.
9. Preparing instructions for crew bosses governing their responsibilities, time schedules, and camp routine while in camp. Issuing these to each crew boss and posting on bulletin board.
10. Determining supply and personnel requirements for the camp-management unit.
11. Organizing and mobilizing personnel for assignment in accordance with the plans for the shift. Actual dispatch of crews will be done by service chief.
12. Maintaining tools and equipment and assembling by logical line unit for issue each shift. Establishing and maintaining a system of accountability.

28 - Air-Service Officer

The air-service officer is responsible to the service chief. He will assign air-service managers, pilots, and maintenance men as needed. His responsibilities include all aircraft--both fixed-wing and helicopter. He may represent the service chief at planning sessions to give technical advice on air operations.

The duties of the air-service officer are:

1. Making arrangements at request of service chief to furnish, operate, and maintain aircraft and related facilities.
2. Requesting communications needed for safe and efficient use of aircraft.

3. Directing air-service managers in base operation. Checking aircraft and pilot requirements.
4. Enforcing Federal Civil Air Regulations and Forest Service safety regulations relative to aircraft at Service bases.
5. On request of air attack boss, contacting nearest Federal Aviation Agency (FAA) office; requesting restriction of fire area from civil and military air traffic.
6. Arranging for timekeepers to keep records for aircraft and personnel under his supervision.
7. Being responsible for aircraft takeoff sequencey on priorities from air attack boss.
8. Seeing that proper facilities are provided for pilots and crews to ensure adequate rest.
9. Being responsible for organizing and operating all service bases; such as, paracargo, chemical mix, and helitack.
10. Being thoroughly familiar with applicable regulations in FSM 5700 and 5740 covering air operations.

29 - Air-Service Manager for Airport and Heliport

The air-service manager for airport and heliport is responsible to the air-service officer or service chief if the air-service officer position is not filled. Air-service managers are required at each airport or heliport that is used as an operating base. The air-service manager is generally responsible for all ground service operations at his assigned base or bases.

The duties of the air-service manager for airport and heliport are:

1. Obtaining the following information on each aircraft assigned to his operating base:
 - a. Type of aircraft.
 - b. Owner and pilot.
 - c. Estimated time of arrival.
 - d. Any limitations on normal use.
2. After securing a priority list of air missions, scheduling all flights to be handled from his operating base. Requesting the

necessary communications and operators through the air-service officer or service chief.

3. Coordinating all flights with the air attack boss and securing clearance from him prior to takeoff of each aircraft or air squad.

4. Assigning a mixmaster in a large operation to supervise the mixing crew, or he may do this himself.

5. Securing and providing all necessary ground facilities, supplies, and services required at his operating base.

6. Organizing and supervising subordinate personnel.

7. Regulating movement of assigned aircraft, motor vehicles, and personnel on the airfield.

8. Maintaining necessary time records on aircraft, equipment, and personnel assigned to operating base.

9. When operating from a commercial airfield, serving as liaison with commercial airport manager and advising him of the necessity to keep private aircraft out of hazardous areas during fire operation.

10. Receiving overhead, crews, and supplies arriving by air at the airfield and verifying arrangements for transportation to assigned destinations.

11. Being thoroughly familiar with and enforcing all safety requirements applying to his operation.

30 - Mixmaster

The mixmaster is responsible to the air-service manager for providing fire retardants to air tankers at the rate specified and for the expected duration of the job.

The duties of the mixmaster are:

1. Determining the size of the job to be done and planning basic equipment, facilities, manpower, and materials that will be needed.

2. Checking accessory equipment such as valves, hoses, and storage tanks. Taking immediate steps to get any items not at hand.

3. Planning the specific layout to conduct his operation.

4. Supervising the crew in setting up his operation.
5. Supervising the crew in the operation of mixing retardants and loading the planes.
6. Making sure supply of retardants is kept ahead of the demand.
7. Attending to the safety, welfare, timekeeping, and transportation of his crew members.
8. Seeing that the airport is cleaned up to the satisfaction of airport personnel before leaving.

31 - Equipment Officer

The equipment officer is responsible to the service chief for determination of transportation needs, including a reasonable reserve, operation, and maintenance of transportation facilities.

The duties of the equipment officer are:

1. On the basis of items to be transported within specific time limits, determining the type and amount of equipment needed.
2. Determining the personnel, drivers, mechanics, packers, etc., needed for operation and maintenance of transportation facilities.
3. Determining the supplies; such as, gasoline, oil, repair parts, forage and saddles, needed to maintain transportation facilities in safe and efficient operating condition.
4. Handling the service and maintenance of mechanized equipment; such as, bulldozers, powersaws, tank trucks, the same as for transportation facilities.
5. Selecting and posting, where necessary, the best transportation route to key points on fire. Will check scouting information to determine how much independent work is necessary.
6. Establishing traffic controls to prevent congestion or accidents.
7. Preparing traffic schedules which permit most economical use of transportation equipment.
8. Placing order through supply officer.

9. Organizing and supervising subordinate personnel.
10. Maintaining current summary of transportation equipment, other than air, showing type and location.
11. Instructing drivers on special precautions, necessary to safe transportation, which are peculiar to the trip.
12. Arranging timekeeping for packers, truckdrivers, mechanics, and for all rental equipment and checking classification to be sure rates are correct.
13. If needed, assigning tractor, truck, or tanker managers to assist.
14. Prepares equipment agreements for that equipment hired for the fire which has no current agreement. Assures that all equipment has an agreement.

32 - Tractor Manager

The tractor manager is responsible to the equipment officer or service chief for the coordination and management of tractors, and the personnel necessary to operate them. He acts as tractor dispatcher on the fire and sends tractors, operators, and tractor bosses to fireline as directed by the fire boss, plans section, or service chief. He keeps currently briefed through close association with the plans section. He does not become involved with direction or tactical use of tractors.

The duties of the tractor manager are:

1. Determining and ordering through the service chief, or equipment officer, the number of tractor bosses, operators, relief operators, mechanics, and lubrication men necessary for effective operation of assigned equipment.
2. Determining and ordering through service chief the type and amount of transportation equipment needed to transport the tractors to the right place and to meet the time requirements.
3. Determining that tractors are in proper operating order at all times. Ordering the supplies needed to maintain the machines in safe and efficient operating condition through established channels.
4. Organizing and supervising subordinate personnel.
5. Maintaining current summary of location, kind, and condition of tractors, transports, and lubricating rigs. Making this information currently available in writing to the plans section.

6. Arranging for service and maintenance of all tractor equipment.

7. Determining that all tractors are under contract. Arranging through service chief to place under contract any tractor not already covered.

8. Working with the plans, is responsible for relief of tractor bosses and operators. Seeing that relief is on shift as scheduled.

9. Briefing and assigning tractor boss to the fireline job:

a. Number of tractors.

b. Location of assignment and route of travel.

c. To whom to report on the fireline, but not what to do.

d. Instructions as to possible length of assignment, relief, timekeeping, and where to report upon completion of assignment.

e. Means of communication when available.

10. Seeing that time is being kept on all equipment in his charge as well as all personnel working with such equipment. This includes swampers, tractors and operators, mechanics, transports, and drivers.

11. Advising the plans unit of any situations that may affect the need for tractors or their ability to get their assignments done.

12. Keeping the plans unit informed of completion of tractor jobs. Working closely with the plans section to be informed of tractor reassignments or releases.

13. Seeing that all tractors get to the right place at the right time and are working as assigned.

14. Promptly releasing men and equipment when directed by fire boss or service chief. Seeing that all timeslips for both men and equipment are complete and correct at time of release.

33 - Truck Manager

The truck manager is responsible to the equipment officer for directing the activities of all ground vehicles and livestock that are used for transporting men, supplies, and machines assigned to the fire.

A truck manager is usually required on fires of two-division size or larger and may be required on any fire where large numbers of privately owned vehicles are used.

The duties of the truck manager are:

1. Checking all privately owned vehicles and livestock for current and acceptable contracts of hire and preparing, with aid of financial officer, necessary contracts if needed.
2. Inspecting all vehicles and livestock for general condition, safety, and visible damage before using. Making a record of inspection result.
3. Keeping time on all vehicles, drivers, packers, and other assigned manpower and submitting to the timekeeper.
4. Maintaining a cumulative record of all assigned vehicles and livestock by appropriate classes and making this information available to the plans unit.
5. Obtaining information from the equipment officer on transportation needs and scheduling vehicles and drivers.
6. Obtaining personnel, supplies, and facilities to handle fueling and servicing needs of assigned equipment.
7. Organizing and supervising subordinate personnel.
8. Selecting and posting, where necessary, the best and safest transportation routes to key points on the fire.
9. Establishing traffic controls and posting traffic safety signs to prevent congestion or accidents.
10. Being cooperative with the camp officer, establishing and policing parking areas used for vehicles and livestock.
11. Checking vehicles in and out of fire camp by time, vehicle description, number, driver, and destination.
12. Strictly enforcing camp discipline regarding vehicles in camp as well as personnel assigned to them.

34 - Tanker Manager

The tanker manager is responsible to the equipment officer or service chief for the coordination and management of all pumping or water-hauling equipment on the fire. This normally includes the ground-fire (not air) tankers, nurse tankers, portable pumps,

and other special equipment. It also includes the personnel necessary to operate them. The tanker manager is not involved with the direction or tactical use of this equipment on the fire.

He may headquarter the personnel and equipment of a tanker pool in an established fire camp or may establish a separate camp for them.

He acts as tanker dispatcher on the fire and sends tanker bosses, tanker personnel, and tankers to the fireline as directed by the fire boss or plans chief. He is kept currently briefed through close association with the plans section.

The duties of the tanker manager are:

1. Determining and ordering through the service chief needed water equipment, assistant tanker managers, records officers, tanker bosses, tanker operators, and crewmen needed for effective operation of assigned equipment.

2. Anticipating, after discussion with plans chief, the reserve needs for men, equipment, and obtaining them through the service chief.

3. Organizing and supervising subordinate personnel.

4. Instructing and training subordinate personnel to perform their assigned jobs.

5. Briefing and assigning tanker bosses to fireline job:

- a. Number of tankers and men assigned them.

- b. Location of assignment and route of travel.

- c. To whom to report on fireline, but not what to do.

- d. How to communicate with tanker manager.

- e. Instruction as to possible length of assignment, relief, timekeeping, and where to report upon completion of assignment.

6. Seeing that subordinates keep and submit accurate time reports on personnel and equipment.

7. Being responsible for relief of tanker bosses and crews. Seeing that men are fed and ready to go on shift as scheduled.

8. Maintaining current summary of location, kind, and condition of tankers and having information currently available in writing for the plans section. This includes type of unit, radio equipment, whether all- or two-wheel drive, capacity, and the size of the crew.

9. Seeing that tanker bosses get the right tankers to the right place at the right time and are working when work has been assigned by the sector boss.

10. Determining and ordering, through the service chief, needed hose, fittings, portable pumps, portable tanks, and other equipment.

11. Through the equipment officer or service chief, arranging for service and maintenance of all equipment.

12. With assistance of communications officer, formulating and activating a workable communication system between himself and his units.

35 - Supply Officer

The supply officer is responsible to the service chief for obtaining and distributing all items called for in the plan for control of the fire and with the exception of those duties assigned to the camp officer, the equipment officer, and the communication officer, of maintaining them in working condition.

The duties of the supply officer are:

1. Keeping current summary of location of all items assigned to the fire.

2. Checking all orders for completeness; determining need for supplementary items.

3. Placing all orders with supplying agency and/or procuring locally in accordance with established procedures.

4. Establishing time limits and scheduling for placing of orders for the various classes of items used and notifying persons responsible for originating orders.

5. Determining obtainability of items which may be needed in control of fire.

6. Determining the replacement rate for all items except communication and transportation, and after approval of service chief, obtaining such replacement.
7. Organizing and supervising subordinate personnel.

36 - Communication Officer

The communication officer is responsible to the service chief for establishing, maintaining, and operating the communication facilities on the basis of statement of communication needs.

The duties of the communication officer are:

1. Determining type and amount of equipment required for the job.
2. Determining personnel needs for technicians, operators, messengers, and guides.
3. Determining repair and replacement needs for crystals, tubes, telephone line and batteries.
4. Installing, maintaining, and operating communication facilities.
5. Preparing schedules to meet requirements of the control plan within the limit of available resources.
6. Maintaining map and chart record of location of equipment.
7. Independently working out and suggesting improvements to communication system.
8. Organizing and supervising subordinate personnel.

Finance Descriptions

37 - Finance Chief

The finance chief works under supervision of the fire boss. He is responsible for organizing and directing the activities of the finance section. He sees that proper obligation documents are prepared for the purchase of supplies, materials, services, and transportation.

This position will be activated along with other top-overhead positions, and will normally be filled by a qualified administrative officer or administrative assistant.

The duties of the finance chief are:

1. Determining organization and arranging for personnel, equipment, and supplies required for the finance unit at all locations where needed.

2. Supervising the work of time officer, compensation-for-injury officer, obligation officer, and claims officer.

3. Providing fiscal advice and assistance to the fire boss, attending fire-staff meetings, and keeping the fire boss advised of fire costs and pertinent matters involving finance section.

4. Working closely with the service chief and others in matters pertaining to financial controls and business management.

5. Checking on demobilization plans and arranging in advance for an assistant disbursing officer.

38 - Time Officer

The time officer works under supervision of the finance chief. He is responsible for time recording, including all personnel, aircraft and other equipment and commissary.

The duties of the time officer are:

1. Supervising timekeepers to ensure that:

a. Time of all fire personnel and equipment is accurately and promptly recorded.

b. Crew boss time reports, individual employee time reports, and equipment use records are safeguarded.

c. Private equipment is covered by rental agreement.

d. Problems regarding employee and equipment time are handled tactfully and promptly.

2. Supervising commissary manager to ensure that:

a. Adequate accounting controls are maintained.

b. Commissary sales are accurately recorded on employee time report.

c. Commissary stock is safeguarded.

d. Commissary stock is maintained in authorized items and in proper amounts.

3. Seeing that facilities and equipment are adequate for efficient work performance in his unit.

39 - Compensation-for-Injury Officer

The compensation-for-injury officer works under supervision of the finance chief. He sees that compensation-for-injury forms are promptly and properly prepared and follows up on each case.

The duties of the compensation-for-injury officer are:

1. Working closely with safety officer, camp officer, and first-aid personnel to make sure compensation-for-injury forms are available, accurately and promptly completed, and forwarded to the appropriate office.
2. Checking with local doctors and hospitals to be sure all injuries requiring professional medical treatment have proper written authorization. Providing forms for the doctor or hospital to use for billing the Bureau of Employees' Compensation.
3. Making sure all witness statements are obtained in writing.
4. Following through to ensure that all forms are completed, and will personally handle the paperwork involved in the more serious injuries and deaths.

40 - Obligation Officer

The obligation officer works under supervision of the finance chief. He is responsible for preparing daily and cumulative obligation data, as coordinated by the Supervisor's Office, for daily fire reports and for adequacy of documentation of all obligations.

The duties of the obligation officer are:

1. Checking with Supervisor's Office to ensure that obligation reporting is coordinated to avoid either duplication or omission of fire obligations.
2. Determining as soon as possible after arrival in camp, and currently during the duration of the fire, that cooperator's equipment and personnel are properly identified to ensure payments as provided for in applicable cooperative agreement.

3. Preparing daily estimates of fire costs and delivering to plans chief for daily fire report.
4. Maintaining cumulative record of fire costs, substituting exact costs for estimates as possible. Making "educated estimates" where exact costs are not known.
5. Checking work of others to best ensure that obligation documents are prepared for all services and procurements, and that such documents are in correct form for payments.
6. Advising the service and finance chiefs of any deficiency or payment peculiarity found when reviewing obligation documents and agreements.
7. When requested to do so by Forest fire headquarters, preparing report of unsubmitted obligations as of close of month.
8. Assisting finance chief as assigned.

41 - Claims Officer

The claims officer works under supervision of the finance chief. Unless formally relieved, is responsible for the investigation and preparation of reports, including forms and witness statements, for any accident resulting in damage to Government or private property, or in injury to employees or nonemployees which will, or could, result in a claim by or against the Government. (See FSH 5132.51, Business Management Guide for Fire Suppression, chapter 800, for detailed procedures.)

The duties of the claims officer are:

1. Working closely with safety officer to make sure that forms are available and accurately completed in all accidents between Government and private equipment.
 - a. Obtaining complete witness statements.
 - b. Taking photographs and obtaining pertinent data when possible.
2. Working closely with the service chief to learn of any damage to private or Government property.
 - a. Advising comptroller and finance chief of any such damage. Making the investigation, seeing that adequate statements are obtained as to cause of damage and conditions which may have contributed to the cause.

b. Seeing that proper forms are completed and promptly forwarded to appropriate office.

42 - Timerecorder

The timerecorder works under supervision of the time officer. On smaller fires one timerecorder may record all personnel, helicopter and equipment time. On larger fires different timerecorders may be assigned responsibility for personnel, equipment, and aircraft timerecording.

The duties of the personnel timerecorders are:

1. Maintain file of forms 6500-59, Fire Time Report, in alphabetical order by crews for each employee on fire.
2. Post time from form 6500-58, Crew Time Reports, to form 6500-59 for each individual daily. Preserve the crew time reports. Have crew bosses and other overhead list men last name first on crew time reports.
3. Record any changes such as separations, transfers to other crews, promotions, or demotions.
4. Record use of rental equipment such as powersaws on owner's fire time report.
5. Identify timeslips of regular Government employees by stamping or writing "Regular Government Employee" on form 6500-59. Send the original through Forest fire headquarters to employee's home Forest.
6. To answer questions concerning standby, lunch time deduction after control of fire, etc., check with time officer or see FSH 5132.51, Business Management Guide for Fire Suppression, section 401
7. At time of release from fire, settle any time, deductions or pay rate disputes before having each employee sign his timeslip.

Aircraft and equipment timerecording:

1. Maintain a daily record of flight and standby time for aircraft assigned to the fire such as helicopters, from pilot's flight report.
2. Check to be sure form 6300-23, Equipment Rental Agreement, has been executed for equipment assigned to fire.

3. Post time from form 6500-76, Shift or Daily Record of Rental Equipment Use, to form 6500-77, Equipment Use Report--Invoice, each day.

4. Submit time for use of equipment belonging to fire employees to personnel timerecorder so it will be included on the employee's time report.

5. Timeslips will not be made out for personal time of equipment operators whose salary is by agreement included in the equipment use rate.

43 - Commissary Manager

Where commissary stores are established to serve the needs of firefighters, a commissary manager will be held accountable for the inventory and issuance of supplies. On small fires, the timerecorder may manage the commissary. On larger fires, more time will be required and a commissary manager may be assigned part or full time.

The duties of the commissary manager are:

1. Maintain a complete record of commissary stock including invoices for material received, issuance records, transfer records and closing inventory, using form 6500-79, Commissary Accountability Record.

2. Operate commissary only when it will not interfere with other activities, usually after shift in the evening.

3. Maintain commissary issue record by crews and submit to timerecorder for posting daily. Use form 6500-78, Commissary Issue Record.

4. Protect commissary stock from pilferage or deterioration.

PART V - REMINDER LISTS

Overhead Briefing

To do the job the fire boss wants, all fire overhead must know what the situation is and what is expected of them.

Strategy meetings of top staff should follow aerial scouting by the fire boss, plans chief, or line boss. Attendance should be limited to fire boss, plans chief, service chief, finance chief, and line boss. The strategy meeting should take place between 1900 and 2100 daily.

Overhead briefing should be conducted immediately after the top strategy meeting or by 2100 daily. If a general briefing is not scheduled, top line overhead can be briefed at 2100, or just after breakfast before going on shift.

Overhead Briefing Outline

1. Orientation.

a. General picture of fire.

(1) Maps (location of fire, topography, fuels).

(2) History of fire to date, including status of control.

(3) Situation (fire behavior, weather, values at stake).

(4) Plan of action, including alternate plans.

b. Control action now in effect.

c. (1) Status of present control.

(2) Rates of line construction.

(3) Problems of line holding in fuel types.

c. What needs to be done.

(1) General plan to accomplish.

(2) Local problems and use of specialized equipment.

(3) Mopup required in different fuel types.

(4) Sources of manpower and local customs of supervising crews.

2. Job assignment.
 - a. Size of jobs.
 - b. Location of jobs.
 - c. Method of operation (strategy and general tactics).
3. Special safety features.
 - a. How safety is handled.
 - b. General safety precautions
 - c. Specific dangers to watch for.
4. Forces assigned.
 - a. Overhead.
 - b. Manpower.
 - c. Equipment.
 - d. Communication equipment.
 - e. Reserves.
5. Service arrangements.
 - a. Transportation (foot, horse, car, plane).
 - b. Communication facilities and schedules.
 - c. Supply arrangements, present and immediate future.
 - d. First-aid facilities.
 - e. Commissary and welfare.
6. Questions regarding assignments.

Good Fire Management Practices

Fire Boss

1. Concentrate first burning period efforts on line work and fire organization.
2. Do not wait for formal plans to start action. Make brief notebook plan and get first men put to work and first needs ordered.
3. Delegate responsibility to staff and expect performance.
4. Keep line overhead on the line with men and out of camp.
5. Do not assume each function is going smoothly. Follow up action in each function until you know how it is going.
6. Plan for efficiency, economy, safety and training.
7. Keep fire camps small and dispersed as needed to serve crews.
8. Use retardant effectively where it can do the job, on early attack and to prevent blowups, not on blowups or running fronts.
9. Have first bulldozers go directly to the fireline. Where access roads are needed, order dozers beyond line construction needs.
10. Get men on the fireline at daybreak when fire is coolest.
11. Conduct strategy planning meetings with top staff and give overhead briefing to lower staff levels to keep informed.
12. Set a simple schedule for fire operation and adhere to it. (See figure 12, sample daily fire schedule.)

Line Boss

1. Get overall view of fire from vantage point en route or from early scouting flight.
2. Meet with fire boss to assist with strategy development as soon as possible.
3. Select and give attention to the most difficult sectors, trying to be there at critical times.

4. See that division and sector bosses receive written instructions, map of fire perimeter and assignments, radios for communication, fire weather and fire behavior forecasts.

5. See that each sector boss reports his daily accomplishment and needs for the next shift for use by plans chief.

6. See that overhead understand policy for working with Montana Indian firefighter crews.

Plans Chief

1. Order large scale planimetric maps and aerial photos promptly.

2. Prepare tool and supply want lists for the service section quickly.

3. Calculate probability and project perimeter on map currently.

4. Compile latest information for briefing as scouts report.

5. Use duplicating machine for maps, daily plans and instructions.

6. Maintain daily envelope file of organization chart, action plans, instructions, daily fire map and daily fire reports.

7. Prepare and post an organization chart for the fire.

8. Plan dispersed fire camps to keep men near line and to reduce travel.

Service Chief

1. Think ahead to anticipate every possible service need.

2. Organize service force to provide two shifts which change at midnight and noon.

3. Keep camp size under 200 men.

4. Recommend establishment of dispersed camps if overlooked in planning. Service chief to inspect each camp.

5. Arrange for scheduled wakeup of overhead and crews to insure placement of men on fireline by daylight. Arrange for night shift crews to arrive on the line by 5 p.m.

6. Use frozen meals during initial phases of the fire to reduce time delay; provide efficient feeding and wholesome food.
7. See that disposable mess gear is used to reduce dishwashing.
8. Rope off supply areas and keep unauthorized personnel out.
9. Provide security measures to prevent fire supplies and equipment from being taken from fire or camp in buses or private vehicles.
10. Take positive action to minimize dust in camp.
11. Provide large bulletin board for fire map, notices and safety messages.
12. Remember to arrange transportation of tools and equipment separately from men unless tool boxes in trucks.
13. Keep helispots and cargo drop sites a safe distance from camp.
14. Set up first-aid station for each fire and sign it.
15. Use insect fog gun to control flies, mosquitoes, etc.

Finance Chief

1. Planning.
 - a. Participate in fire boss staff planning session.
 - b. Use FSH 5132.51, Business Management Guide for Fire Suppression.
2. Personnel Timekeeper.
 - a. Start early to get correct time for each man.
 - b. Insist on crew boss time reports for crews and all overhead units.
 - c. Keep fire time reports with crews as they are moved.
3. Equipment Timekeeper.
 - a. See that every piece of equipment has rental agreement.

b. Inspect equipment and record condition before and after use. Get witness statements and photos if damage claim likely.

c. See that nonproductive equipment is released immediately.

d. Follow up timekeeping on equipment to keep current and accurate.

4. Commissary.

a. Order commissary needs early.

b. Keep accurate records and post to timeslips currently.

5. Property accountability.

a. See that equipment and supply inventories are maintained.

b. Check waybills for incoming and outgoing shipments.

6. Procurement.

a. See that purchasing is done through central purchase except for authorized local purchases.

b. See that purchase vouchering is done promptly and properly.

7. Compensation for injury.

a. Process injury cases thoroughly.

b. Fully investigate injury cases and get witness statements.

8. Plan adequate help for hiring and releasing crews.

9. Try to close the fire suppression job and the fire fiscal job at the same time.

10. Be alert to situations which may produce claims such as private vehicle damage, etc., and initiate preliminary investigation of facts in case claim is presented.

FIGURE 12--SAMPLE DAILY FIRE SCHEDULE

TIME	FIRE BOSS	PLANS CHIEF	SERVICE CHIEF	LINE BOSS	FINANCE CHIEF
0330 TO 0400	LINE OVERHEAD BRIEFING. SESSION TO ISSUE MAPS AND INDIVIDUAL ASSIGNMENT SHEETS.		DISPATCH LINE FORCES.	LINE OVERHEAD BRIEFING.	ATTEND OVERHEAD BRIEFING.
0400 TO 0500	BREAKFAST.	BREAKFAST.	BREAKFAST.	CHANGE SHIFT.	CHECK OUT CREW BOSS.
0500 TO 0800	NIGHT OVERHEAD INTERROGATION.	DETERMINE NIGHT SHIFT PLANS AND	NEXT 24-HOUR SERVICE NEEDS. PROGRESS AND PROBLEMS ON MAP.	LINE SUPERVISION.	SUPERVISES TIMEKEEPING, COMPENSATION FOR INJURY, OBLIGATIONS AND CLAIMS. PROVIDES COMMISSARY FOR NIGHT CREW IN MORNING, DAY CREW IN EVENING.
0800 TO 1000	FIELD RECONNAISSANCE, SUPERVISION, REVIEW PLANS.	NIGHT PLANS, BASE MAPS AND ASSIGNMENTS.	NIGHT SHIFT PREPARATION.	CRITICAL SECTOR SUPERVISION.	
1000 TO 1300	FIELD RECONNAISSANCE, AVAILABLE BY RADIO.	OFF DUTY.	INVENTORY AND ORDERS.		
1300 TO 1500	FIELD RECONNAISSANCE, SUPERVISION OF ALL FUNCTIONS.	RECONNAISSANCE, SUPERVISION. DETAILED INSTRUCTION FOR NIGHT SHIFT.	SERVICE UNIT SUPERVISION. INSPECTION FIELD CAMPS.	LINE PROGRESS INSPECTION AND SUPERVISION.	OFF DUTY.
1500 TO 1600	REVIEW DAY INTELLIGENCE REPORTS AND FORECAST. LINE OVERHEAD SUPPER, 1530 TO 1545.		WAKE AND FEED NIGHT CREW 1545 TO 1600. NIGHT SHIFT DISPATCH ARRANGEMENTS.		CHECK OUT CREW BOSS TIME LIST.
1600 TO 1630	BRIEF LINE OVERHEAD, MAKE ASSIGNMENTS.		DISPATCH LINE FORCES.	CHANGE SHIFT.	OFF DUTY - SUPPER.
1630 TO 1800	OFF DUTY - SUPPER.	OFF DUTY - SUPPER.	OFF DUTY - SUPPER.	LINE SUPERVISION.	SUPERVISE DAY SHIFT,
1800 TO 1900	DAY OVERHEAD INTERROGATION.		INITIATE PREPARATION FOR DAY SHIFT SERVICE NEEDS.	LINE SUPERVISION.	CHECK IN CREWS AND EQUIPMENT. PROVIDE EVENING COMMISSARY FOR DAY CREW. PREPARE COST ESTIMATE FOR DAILY REPORT.
1900 TO 2100	JOINT PLANNING AND DECISIONS FOR SECOND DAY INSTRUCTIONS		SERVICE PLANS AND DECISIONS FOR SECOND AND THIRD DAY.	LINE SUPERVISION.	JOINT PLANNING MEETING.
2100 TO 0300	OFF DUTY.	OFF DUTY, AFTER ASSIGNING PREPARATION OF MAPS AND INDIVIDUAL ASSIGNMENTS.	OFF DUTY, AFTER ASSIGNING NIGHT SERVICE WORK.	ON SHIFT UNTIL 0500.	OFF DUTY.

Methods of Attack

There are three basic methods of attacking a fire: (1) direct, (2) parallel, and (3) indirect. Each is adapted to certain conditions of fire behavior. Air attack may be used to supplement ground attack. Usually a combination of methods is used. The choice of methods depends on:

1. Behavior of fire at time of attack.
2. Safety of men.
3. Topography and natural firebreaks to facilitate economy of line construction versus values.
4. Chances of crown fire.
5. Intensity of wind and influence of other weather factors.
6. Safety in burning out.
7. Type of equipment available.
8. Amount of labor required and available.
9. Experience and dependability of overhead and line forces.
10. Qualified men available to supervise backfiring.

Good judgment and skill are necessary for successful application of these methods.

Ground Methods

1. Direct Method. The direct method of fighting a fire treats the fire as a whole, or its burning edge, by wetting, cooling, smothering, or chemically quenching the flame, or by mechanically separating the fire from unburned fuel. By this method, attack is directly on the edge of the fire. A hot grass fire can be fought successfully with wet sacks and swatters, or by smothering the flame with dirt. Often the spread of a fire can be stopped by applying water directly on the burning material. The direct method may be employed on sections of the fireline that have cooled so the edge of the fire can be dug out, scraped, or pushed into the burned area or extinguished. This method eliminates the need for burning out. The fire edge is the line location.

Care is required in line construction to prevent burning material from crossing the line. The direct method is recommended for the following situations.

- a. On a smoldering or creeping ground fire.
- b. During night or early morning hours when burning intensity has slowed and the flames can be beaten out or smothered.
- c. When the fire is burning against the wind.
- d. When much fire perimeter has gone out and digging out a few smoldering spots will result in control. This is usually during the night or early morning hours.
- e. Where there are light fuels and the heat is not too intense for men to work safely on the fire edge.

(1) Cold Trailing. Cold trailing is a method of controlling a partly dead fire edge by careful inspection and, if necessary, feeling with the hand to detect any fire; digging out every live spot, and trenching any live edge.

Cold trailing is a part of the direct method of control. Experienced firefighters should make maximum use wherever the fire edge appears dead. Before leaving, firefighters should encircle all fires with a control line, with the exception of some grass fires where inspection may be adequate.

(2) Hotspotting. Hotspotting is a practice of constructing short sections of line to check the spread at critical points or hotspots in advance of regular line construction crews. It may be used for the following situations: (1) During initial attack, to check spread of small heads or fingers. (2) On a sector of a large fire, in advance of line construction crew to keep fire within planned limits. (3) In advance of cold trailing; small crews are sent ahead to dangerous points along edge of fire to check localized flareups.

2. Parallel Method. Use this method when a fire is too hot, or there is too much smoke, to stop the spread by direct attack. Construct the control line approximately parallel to, but far enough from, the fire edge so men and equipment can work effectively and safely. Lines may be shortened by cutting across unburned fingers.

Follow as close to the fire as possible unless a saving in the total job of line construction and mopup can be made. Start control line at an anchor point, such as rockslide, road, trail, stream, or clearing, and work parallel to the fire edge. The distance between the control line and fire edge will vary with intensity of heat and smoke, location of natural barriers, dangerous fuel, and fire edge regularity. Allow sufficient distance to build line and safely burn out. Scout ahead for shortest, quickest, and safest route.

The parallel method may be best to use:

- a. On slow- to medium-fast running fires.
- b. When using plows, dozers, or other mechanized equipment.
- c. Where there are numerous spot fires.
- d. Where line can be shortened by cutting across fingers.
- e. On steep slopes below the fire to avoid undercut fire lines.
- f. On areas where material can be fired as it lies and can burn out quickly without special danger of crown fires.
- g. Where natural barriers may be used for fireline.
- h. Where resistance to control is less by locating the control lines away from the fire edge.

3. Indirect Method. The indirect method of fighting a fire consists of selecting a location and preparing a fire control line a material distance, of usually more than 100 feet, in advance of the fire path and burning out the intervening area. Such a method may be used to stop the spread of crown fires and large, hot, fast-running ground fires. Whenever practical, use preconstructed fire-breaks, streams, roads, trails, fields, or other barriers as anchor points for the control line. The area to be backfired is wider than in the parallel method and usually allows a choice in timing when the backfire is set. This method of fighting fire requires maximum skill and must be directed by thoroughly experienced foremen.

The indirect method should be used on:

- a. Large crown fires.

b. Fast-running ground fires where it is not safe to work crews except along natural or artificial barriers.

c. Where natural or preplanned barriers are present.

d. In extremely steep or rugged topography where change of slope will favor control.

Air Methods. Techniques and procedures to cascade water, chemicals, and retardants on fires are being perfected rapidly.

Direct air attack may be used for the following purposes:

1. To put out or "knock down" small fires, which must be ground checked.
2. To check the advance of a fire until ground forces arrive.
3. To support ground attack forces:
 - a. Knock down and cool hotspots so ground crew may attack direct.
 - b. Lay retardants to stop the advance of a fire so ground forces may construct control line.
 - c. Lay hose lines for pumper operation.

Coordination of Air and Ground Attack. The fire boss is responsible for all operations planned to control a fire. He must order air methods when feasible, and coordinate the air attack with ground attack to obtain fast, energetic, and thorough control by the most economical combination of methods.

He must plan ahead and consider the value of resources endangered. An intensive concerted attack with aircraft during the initial period may prevent thousands of acres from burning and save unlimited values in resources.

Fire Tactics

Principles of Line Location. Locate line, after consideration of the following:

1. To have line adequate distance from fire so that line can be completed, fired out and held with probable rate of spread and fire behavior.

2. To allow adequate time to permit available forces not only to build lines but also do needed supplemental work, such as snag felling and backfiring, in advance of bad burning conditions.

3. As close to fire edge as conditions permit.

4. To make line as short as possible.

5. To use easiest routes for control without sacrificing:

a. Holding practicability.

b. Too much area.

c. Values.

6. To eliminate all possible hazards from fire area and to provide adequate safe distance between lines and hazards that must be left in the fire area.

7. To avoid undercut lines and sharp angles.

8. To utilize barriers where practicable.

9. To take advantage of the possibility of use of machinery for construction of fireline.

10. To provide for safety of men.

11. To encircle area where spot fires are so numerous that it is impractical to handle as individual fires.

Principles of Line Construction

1. Make line no wider than necessary.

2. Clean all lines to mineral soil.

3. Scatter charred or burning material inside burned area.

4. Scatter unburned material whichever way is easiest and fastest, provided this does not make line too hot to hold or complicate mopup. If fuel is needed for backfiring, place inside line.

5. Protect undercut lines against rolling material.

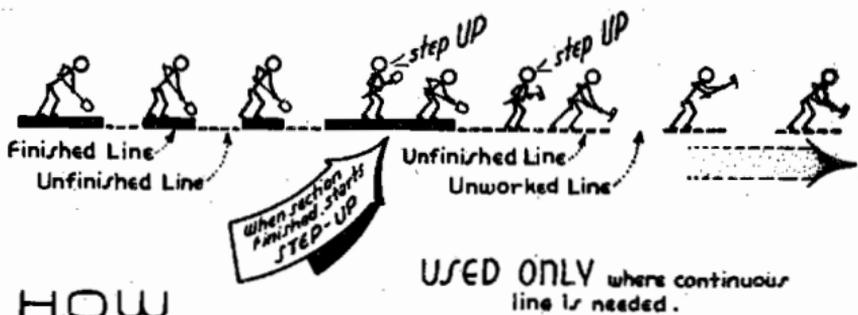
6. Effectiveness of line width can be increased by cooling down adjacent fire with dirt or water.

7. Rotten logs and stumps just outside the line should be covered with dirt or wet down if water is available.

8. Fall or isolate snags near line before burnout if time permits.

9. A control line is not complete until it has been burned out.

Progressive Line Construction



As each man connects his work with that of the man ahead, he forces that man to move forward. This causes all crewmembers ahead of him to move on to new sections of unworked or unfinished line. No one moves around anyone else to a new position in crew regardless of how often he has to ask the man ahead of him to STEP UP.

Principles of Backfiring and Burning Out

1. All control lines except those right at the fire edge must be fired out to be effective.

2. Favorable conditions for backfiring must be watched for, recognized, and prompt action taken.

3. Recognize that backfiring is often justifiable under adverse conditions. Little to lose, much to gain. Portions of line held will narrow fire front.

4. In backfiring operations consider these guides:

a. Proper location and construction of line.

b. Timing operations correctly:

(1) To take advantage of current and predicted weather.

- (2) Proper sequence to tie in with other sectors.
 - (3) Proper speed to get width of burn necessary to hold.
 - (4) To complete the job within time limits allowed.
- c. Take advantage of drafts created by main fire, and by slope and topography.
 - d. Start backfire on higher portion of line so that the operation will proceed downhill.
 - e. Avoid sharp angles in line. If unavoidable, use echelon firing.
 - f. In unfavorable weather use auxiliary strip firing.
 - g. Stop firing when backfire will not take.
 - h. Use specialized equipment.
 - i. Use dirt or water as aids to hold backfire.
 - j. See that all crews know plan and are in the clear before setting backfire.

Principles of Tractor Use

1. Be sure that all tractors used are in good mechanical condition, have approved spark arrestors, have safety canopy (when operating in timber or woodland type) and have been signed up on Form 6300-23, Equipment Rental Agreement.
2. A tractor replaces many men. The cost and accomplishments justify top supervision (tractor boss), operators, service facilities and line location.
3. Avoid excessive slopes and rocks on which tractor can hang up.
4. Work tractors in tandem when possible, especially when working near a fast-moving fire. Provides faster line construction and assistance if one machine hangs up or breaks down.
5. When possible, provide two operators per tractor, per shift, and alternate operators. One not operating will act as spotter.

6. Use powersaw crew to buck logs and fell trees or snags in fireline if necessary.

7. Push inflammable material to outside of tractor line, except on direct attack when hot material should be pushed well inside and scattered.

8. Allow no unauthorized person to ride on tractor.

9. During mopup:

a. Use tractor to push large logs or hot piles into burned area.

b. Scatter and level cat piles on inside of line.

c. Push over short hot snags and stumps.

10. Servicing.

a. Plan to lube and fuel at each change of shift. Have tractor lights available for night shift.

b. Have water available to fill radiators and flush radiator shell.

c. Have rations, flashlights, first-aid kits and canteens available for each tractor.

11. Timekeeper, tractor boss or sector boss must keep record of operating time of each tractor.

12. Operators, spotters, and tractor boss should understand and use standard signals for directing tractors.

Principles of Water Use

1. Use water sparingly, whether using a canteen pump, backpack pump, portable pump, or a tanker.

2. Direct water at the base of the flame to be effective.

3. Water alone will not do the job. Have handtool men work with nozzle men to make most effective use of water, especially during mopup.

4. Good communication between nozzle men and water source, either radio or by hand signals, is essential.

5. Have the correct fitting for the job, such as shutoff nozzles for tankers, straight nozzles for air-cooled portable pumps, applicators for mopup.

6. Plan for ample water supply for tanker shows; that is, mother tankers, close water points. Coordinate so all units do not run out of water at once during the critical period.

7. Do not block roads with tankers. Always allow room for emergency traffic or exit in case of trouble. Keep tankers headed in right direction for escape, if necessary.

8. Do not depend on water alone; always have handtools available and use them if water runs out or pump fails.

9. After direct attack with water, always follow with a handline to mineral soil around entire fire.

10. Provide goggles for use of nozzle men.

Principles of Mopup

1. Start mopup as soon as line construction and burnout are complete.

2. Allow fuel to burn up if it will do so promptly and safely.

3. On small fires, mop up entire area if practical.

4. On large fires, mop up far enough in to be certain that no fire can blow, spot or roll over the fireline under the worst possible conditions. Fell all snags which could spot across line.

5. Search for smoldering spot fires.

6. Attend to snags, punky logs, and fuel concentrations which occur outside of line.

7. Search for and dig out burning roots near line.

8. Separate and scatter concentrations of heavy fuel.

9. Put all material which may roll where it cannot roll across line.

10. Trench below heavy logs, stumps, or material so they cannot roll.

11. Feel out line with hands for possible smoldering spots.

12. Use water in conjunction with handtools where possible or practical. In dry mopup, stir and mix hot embers with dirt.

13. Cold trail or cut unburned or partially burned brush near line. Prune up reproduction thickets near line.

Principles of Aerial Use

1. Air Tanker Planes.

a. If chemical can be used call for it early; follow up with aggressive suppression action.

b. Consider:

(1) Type of fuel--brush or tall timber.

(2) Wind conditions--not over 30 m.p.h.

(3) Terrain--can plane maneuver to release effective drop?

(4) Visibility--can pilot see target?

(5) Will drop contribute to control of fire?

(6) Safety of ground personnel.

(7) Can mission be accomplished during daylight?

c. Do not depend on chemical drop--fight fire aggressively, use assist from chemical if it gets in.

d. Suspend drops as soon as they are no longer effective or essential.

e. All drop planes will have radio communication--keep in contact with pilot if he is an initial attack pilot, with air attack boss if in air.

f. Are there physical hazards in drop pattern--telephone lines, powerlines, towers.

g. If conditions or terrain make operation of fixed wing air tanker unusable, consider use of helicopter with water drop accessory or one with fixed chemical tank.

2. Air Cargo.

a. Use paracargo drops to supply crews in isolated areas.

b. If weather, smoke, or cloud conditions make flying questionable, do not rely entirely on paracargo. Consider emergency supply by pack string or man pack.

c. Locate drop spot on ridge top, meadow or sidehill with approach and getaway clear of obstructions for low flying planes, good visibility and clear of snags, tall timber and rocks.

d. Mark target area with white or orange "T" in open or cleared ground. Erect paper streamer on long pole as wind indicator.

e. Danger zone is 200 feet on each side, 300 feet on approach, and 1,300 feet on getaway leg of flight line. Keep all personnel, animals, and vehicles clear of danger zone.

f. Have camp no closer than 600 feet from target and outside danger zone.

g. Station lookouts on each side of danger zone to count and spot each drop.

h. After retrieving, untie (never cut) shroud lines, fold and store parachutes for return to base.

i. Place all orders for paracargo well in advance of need. It takes time to process, package, transport and drop cargo.

j. If good helispot and helicopters are available, consider supply by helicopter air freight. Depends on type of helicopter available, air traffic in vicinity, and relative cost. In difficult ridgetop situations, loss of paracargo may offset additional cost of helicopter with no loss.

3. Helicopter.

a. Scouting and reconnaissance.

(1) Where heliports or helispots are close to area and airports are a long distance away.

(2) For detailed scouting of a fireline.

b. Transportation of personnel.

(1) Where distance of foot travel will not meet time limits.

(2) Where difficulty of travel (steep slopes, heavy brush, barriers) would result in wornout men arriving on line.

(3) Where speed of attack is essential--can initial attack or immediate followup control fire?

(4) Retrieving smokejumpers to get them back to base if needed.

(5) Removal of sick or injured.

(6) Quick movement of men for safety reasons.

c. Air freight.

(1) Transportation of food, equipment, and supplies to isolated heliports.

(2) Retrieving valuable or needed supplies or equipment.

4. Infra-Red Mapping Unit. An infra-red mapping unit is based at Boise, Idaho, for use in mapping fires where smoke and/or darkness reduces the effectiveness of normal air and ground reconnaissance to determine accurate location of the fire perimeter or spot fires.

Imagery produced requires a trained interpreter who must be furnished by the using unit.

Fire Camp Reminders

Planning and Setting Up Camp. The time available for planning a camp is usually very limited. Therefore a systematic scheme for quick planning is necessary. The following tickler list will assist in formulating a plan. (See figures 13, 14, and 14a.)

1. Roughly sketch site, indicating usable ground.
 - a. General wind direction, smoke, dust, noise.
 - b. Water supply, kitchen.
 - c. Roads, trails into camp, and to fireline.
2. Locate on sketch and ground:
 - a. Kitchen--on windward side to avoid dust, stench, etc. Put above other camp units on running water.

b. Tool and timerecorder station--locate a point where crews will leave and enter camp.

c. Parking space--put trucks and pack strings where dust, noise, and stench will not reach camp.

d. Radio or telephone--at timerecorder's station if he handles; away from camp noise if special operator.

e. Bed ground--in crew units and reserve ample space. Avoid dusty, noisy location. No snags.

f. Latrines--downwind, accessible to bed grounds.

g. Garbage pit--downwind, away from water.

Developing Camp. Existing circumstances will determine procedure. If line crews arrive simultaneously with camp officer and equipment, the first job is to tool up and get crews started to fire. Unload only the supplies needed for them to take to line. Hold mess outfits and food on trucks until kitchen site is definitely located.

1. Kitchen. Arrange stoves and open fire so smoke blows away from kitchen. Wood for Kimmel stoves, 20 inches long. "T" table for double line feeding, 16 to 20 feet long, depending on size of crew, not over 30 inches high. (See figure 14.)

For table, get: 10 posts, 4-inch top, $1\frac{1}{2}$ ax handles long.
6 cross arms, 3-inch top, $1\frac{1}{2}$ ax handles long.
2 top poles, 3-inch top, 3 ax handles long.
2 top poles, 3-inch top, 7 ax handles long; or
4 top poles, 3-inch top, 4 ax handles long.

Cook's worktable: 6 posts, 4-inch top, $1\frac{1}{2}$ ax handles long.
3 cross arms, 3-inch top, $1\frac{1}{2}$ ax handles long.
2 top poles, 3-inch top, 4 ax handles long.

Tent fly (if used): 4 poles, 3-inch top, 6 or 7 ax handles long.
1 pole, 3-inch top, $5\frac{1}{2}$ ax handles long.

Supplies: Food stacked on poles on ground. None stored under serving tables; they leak.

Rope or pole fence: Keep loafers out of kitchen.

2. Garbage. Dry pits, downwind. Do not burn, wind changes and stench bad. Boxes at kitchen for dirty dishes and table scraps. Put on downwind side because of flies.

3. Latrines. Downwind, screened from camp, road, and trail. Pole 4 inches in diameter; dead wood best, no pitch. Set not over 20 inches high (two-thirds ax handle). Directional signs or blazes from camp and bed grounds.

4. Parking Lot. Downwind, trucks and cars headed out, drivers stationed.

5. Bed Grounds. Windward side, quiet, no smoke or dust. Crew units, location of crew bosses; away from kitchen water supply. Snags are dangerous; cut for wood. Warmup fires for each bed ground. Signs, directional, crew assigned.

6. Washup Station. Downstream from kitchen; well-drained ground, no mud. Lantern night and morning. Towel racks in sun for drying. Signs, directional, from timerecorder's station and bed grounds.

7. Timerecorder's Station. Proper location to see men come in and leave camp, tool supplies, etc. Accessible as commissary. Fence to keep out loafers. Tool racks, one for each crew. Racks simple, single pole $2\frac{1}{2}$ feet above ground. Fasten to posts, trees, or stumps. Lean tools against pole--safer and adequate. Signs, name or number of crew.

8. Stable. Pack stock. Downwind because of stench and flies. Downstream from camp water supply. Snags, rocks, logs with sharp limbs or knots are dangerous. Space at hitch or feed racks, 6 feet per animal.

9. Flies. If flies, hornets, or mosquitoes become a nuisance, spray DDT solution or apply with cloth. Use care not to get in food. Recommend use of insect fog guns when available.

Figure 13

FIRE CAMP LAYOUT
(100 to 200 men)

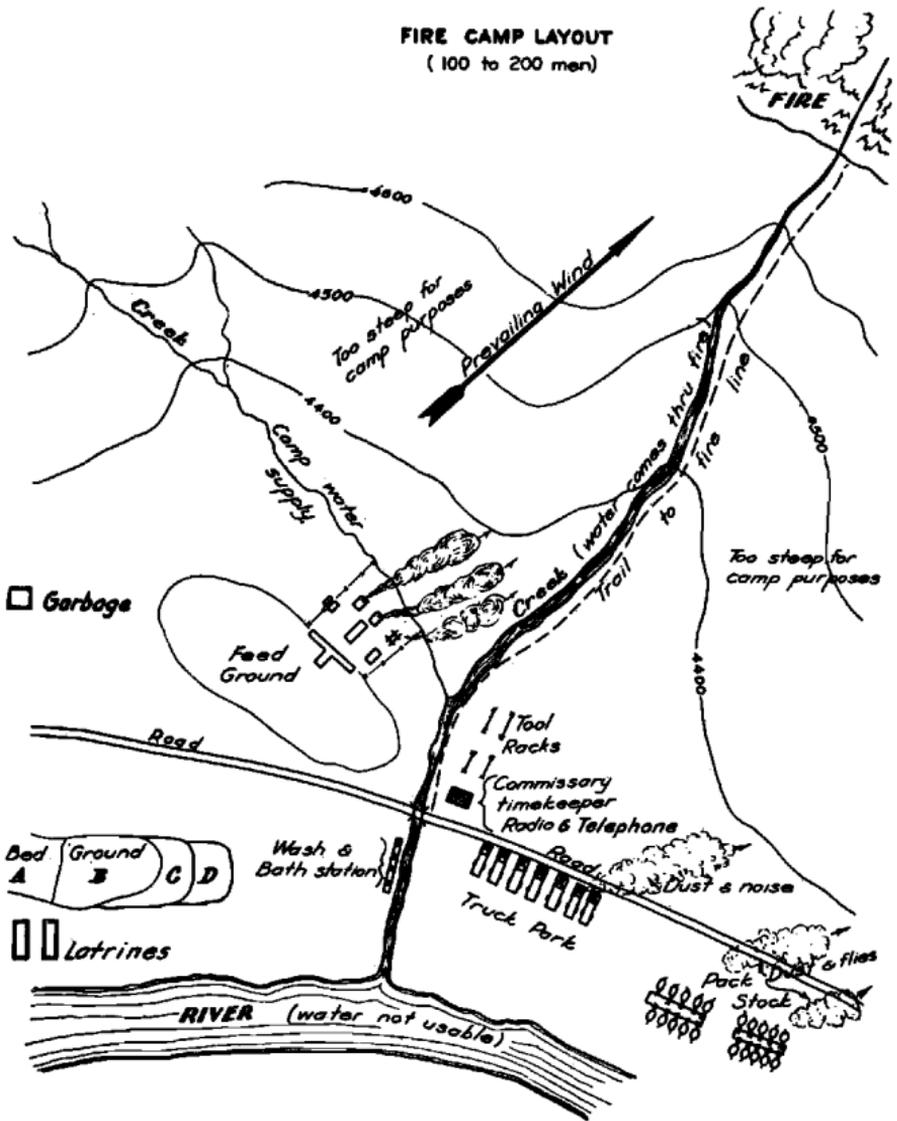


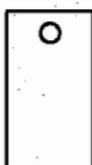
Figure 14

FIRE CAMP KITCHEN



Fuel

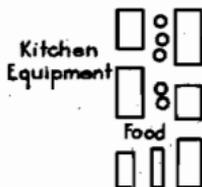
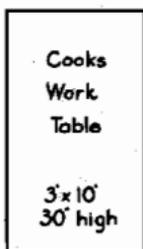
Open Fire



Stoves



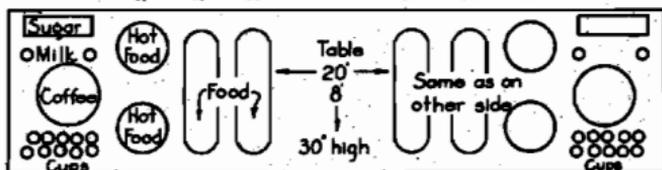
One stove up to 50 men
Two stoves 50 to 200 men



Dishup Flunkies



Coffee Flunky



Coffee Flunky

Crew men help selves to plates, silverware, bread, butter, etc. Flunkies serve hot food and coffee, milk, and sugar.

Men with filled dishes are sent from line in opposite directions thus eliminating the congestion of a single line table.

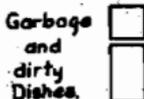


Figure 14a

USE INSTRUCTIONS — STEAM HEATER

pre-cooked frozen meals

STEAM MEALS FOR
40 MINUTES (MINIMUM)

AFTER STEAMING,
HEAT SOURCE CAN
BE REDUCED (FOR
SERVING MEALS AT
A LATER TIME)

ARRANGE MEALS
ABOUT 3 PER PAN

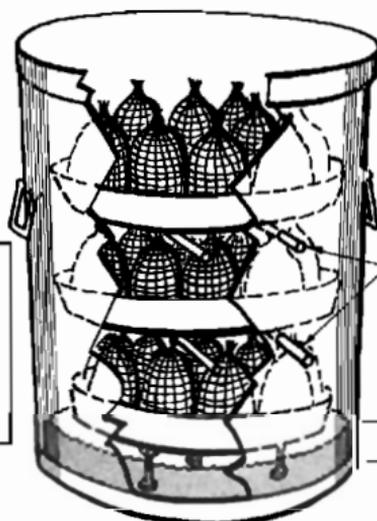
OR

ABOUT 11 PER WOODEN
SHELF

CAUTION— DO NOT PACK
TOO TIGHT



CLOSE COVER
TO STEAM
HEAT MEALS



METAL RODS

3" WATER LEVEL

HEAT SOURCE

MAY BE

- OPEN FIRE PIT
- PROPANE STOVE
- KIMMEL STOVE
- OR ANY OTHER USEABLE
HEAT SOURCE

Camp Crew

1. Obtain men for camp detail--cooks, flunkies, timerecorders, packers, truckdrivers, etc., and direct their work.
2. Organize camp help and give them instructions.
3. Instruct cooks on number of men to be fed and when first meal is needed.

Kitchen Operation

1. First order of supplies to be sent out from Ranger or Forest headquarters, following a planned list for the number of meals to be provided. (See part VII, catalog.)
2. Future orders to be prepared by one person--preferably one with experience as steward--after an inventory has been taken of supplies on hand. This order to be screened by supply officer. If planned list is followed, deduction should be made for supplies on hand. Supply officer should have camp boss and messing experience to meet qualifications to do the job.
3. Emphasis to be placed on furnishing plentiful, wholesome, well-prepared foods, rather than on variety. Emphasis to be placed on use of oven in fire camps. Beef and ham roasts may be served with gravy in camp, and make excellent sandwiches. Because of less waste, ham should replace bacon. Hamburger also has utility for camp, fried or in meat loaf, or for sandwiches. Meat cutting in camp should be held to minimum.
4. Fresh fruits should be confined to types that carry and keep well, and that can be utilized in lunches--such as oranges and apples. Cantaloupe, if placed in large garbage cans with chopped ice, are excellent for camp meals. Peaches, pears, and grapes in season are good when truck transportation is available.
5. Fresh vegetables should include potatoes, tomatoes, onions, celery, carrots, lettuce and other vegetables in season. These serve a dual purpose for stews, and salads. Vegetables should be cleaned and iced well in advance of planned use; protection from sun and dust is a must.
6. Eggs should be purchased in medium size, and careful check made before each order of stock on hand and expected manpower. Three eggs per man per day should be figured.
7. Canned vegetables should be restricted to standard items of peas, string beans, tomatoes, and corn. Avoid such items as sauerkraut, asparagus tips; etc.

8. Use margarine--not butter.

9. If the need for mess continues beyond the first day, stew should be on the stove at all times. It should contain plenty of meat, with potatoes, onions, and carrots, replenished often. Vegetables should not be placed in original stew until meat is fairly well cooked.

10. Sandwiches should contain palatable, tender meat, lettuce, and margarine. One jam or jelly sandwich should be supplied in each lunch. Prepared pork loaf or other canned highly seasoned meat preparations should be avoided as much as possible.

11. Cold juices should always be on tap in camp, preferably unsweetened varieties such as grapefruit and orange. Carbonated beverages or soda pop will not be supplied.

12. Kitchen should be roped off well, and none but kitchen help permitted. Dishwashing is very important. Use plenty of hot water and detergent soap. Change wash water and scalding water often.

13. Use disposable mess gear to reduce^d dishwashing.

14. Garbage disposal and facilities should be given high priority.

15. Camp officer should be experienced in messing large numbers of men, or should be furnished with a high type of cooks and helpers.

16. Camp officer will maintain high standards of sanitation in all kitchen operations including rigid requirements for personal cleanliness of kitchen crews.

Camp Operation

1. Feed men at time designated by fire boss.
2. Run men through the lines by crews where possible.
3. Keep men, including overhead, not a part of the regular kitchen force, out of the kitchen.
4. Provide warmup fires away from the kitchen at feed ground.
5. Make crew bosses responsible for maintaining order.
6. Designate sleeping areas.

7. Have double lunches prepared and sacked before breakfast.
8. See that camp and grounds are kept clean.
9. See that dishes are rinsed in hot water.

Equipment and Supplies

1. Order men, supplies, and equipment to meet the plans of the division or sector boss.
2. Carry an inventory of all supplies and equipment in camp.
3. Have all waterbags soaked for use.
4. Have garbage pits and toilets sprinkled with lime daily.
5. Have canvas or plastic shelter in case of storm.
6. See that there is no waste of supplies or equipment.
7. See that a supply of kitchen wood is maintained.
8. Check food supply orders and eliminate unrealistic or unreasonable items.
9. After first day, order open-stock supplies.
10. Keep tools sharpened.
11. See that crew boss has his tools placed in toolrack.
12. See that bedding is properly checked out and accounted for.
13. Have crew boss see that his men roll, mark, and stack their beds each morning.
14. See that light for camp and fireline are ready for use.
15. See that outgoing equipment and supplies return to proper destination.

Transportation

1. Provide transportation for men, supplies, and equipment.
2. Schedule trucks; see that they take excess equipment from camp on return trips.

3. Keep a supply of gas and oil at camp.
4. Keep motor equipment serviced.
5. If pasture is used, require packers to wrangle stock at daybreak.
6. See that sufficient hay and oats are on hand but not wasted.
7. Schedule pack trains and require full loads.
8. Order transportation in ample time for men being released.

Communications

1. Establish, as soon as possible, communications with the headquarters and other camps and parts of the line.
2. Keep communication channels functioning, messages recorded, and brought to the attention of the right persons.
3. Provide for messenger service if needed.

Timekeeping and Reports

1. See that time records are kept for camp labor and overhead and submitted to timerecorder daily.
2. Place commissary in custody of time officer.

Breaking Camp

1. Obtain from sector boss each evening which crews to be released the following day.
2. Arrange for transportation, feeding en route, etc., of released men.
3. Have timerecorder finish timeslips.
4. Have crew bosses of crews released check in all equipment.
5. Check, get signatures, and initial timeslips.
6. Return equipment and supplies to proper destination.
7. Clean up campsite.
8. Cover garbage pits and latrines.

9. Unless otherwise directed, tear down tables, kitchen, etc., and pile loose poles.

10. Put out all fires.

Man-Caused Fire Investigation

Start investigation at the earliest possible moment. The success of the trespass investigation and law enforcement will depend upon your actions. Your job is to secure all information and evidence possible.

1. How to do it:

a. En route to fire:

(1) Make note of description of anyone who might be suspect and record license numbers.

(2) Look for and preserve tracks or other evidence.

b. In vicinity of fire:

(1) Determine point of origin from wind and direction of fire spread. Mark spot and make notebook sketch map.

(2) Protect evidence at origin with barricade of logs, brush or limbs.

(3) Record all information obtained, names of anyone seen or contacted, and gist of any conversations.

c. As soon as possible:

(1) Secure statements from witnesses or persons who may have been in the area when fire started. These statements need not be elaborate, but should be complete as to detail and should be secured as soon as possible. Have the person who knows how the fire started or other factual information recite the facts to you or write them down himself, preferably before another witness. Ask questions to get needed points covered. Have the individual sign and date the statement, and you and any witness sign.

(2) Interview witnesses individually, accompanied by another Forest Service employee where possible.

(3) Keep the information secured confidential and report it to the fire boss or District Ranger.

Montana Indian Firefighters Policy
(See FSH 5132.51)

1. Each crew of about 25 men will have a Forest Service man as crew liaison officer. He is responsible for the health, welfare, safety, and effectiveness of his crew.
2. Each crew has its own crew bosses and squad bosses. Do not put non-Indian sector team crew and squad bosses with the MIF crews. The sector boss will issue instructions through the crew liaison officer.
3. Crew liaison officer shall be briefed on status of fire and safety precautions by sector boss before taking crew on shift.
4. Check Instructions for Use and Management of Montana Indian Firefighters in FSH 5132.51 for policy on pay rates, travel and standby time, and point of pay. Make not commitments which conflict with the policies in the MIF instructions.
5. Do not split 25-man crews into smaller groups for different line assignments unless unavoidable. Work through the crew liaison officer to get permission of the Indian crew boss when it is necessary to use squad units away from the crew even within the same sector.
6. Do not mix individual Indians from organized crews with other firefighters. The crews are to be fed and bedded down as units.

PART VI - CODES, LEGENDS, SIGNALS, AND MISCELLANEOUS

GROUND-TO-AIR EMERGENCY CODE

(STANDARD SMOKEJUMPER SIGNALS MAY BE USED FOR ANY EMERGENCY)

CHANGE JUMP SPOT - - - - - J	NEED LIGHT DUTY PUMP - - - - APP
CARGO DROP TARGET (FORM NUMERAL TO IDENTIFY TARGETS WHEN SEVERAL IN AREA) - - - - - T OR T ²	NEED MORE HELP (FORM NUMERALS FOR TWO OR MORE MEN) - - - 2
HELICOPTER LAND SPOT (FORM NUMERAL TO IDENTIFY SPOT WHEN SEVERAL IN SAME AREA) - - H OR H ³	FIRE MANNED ADEQUATELY - - ---
NEED CROSSCUT SAW - - - - - S	JUMPER OK (PARACHUTE AND L) - L
NEED POWERSAW - - - - - SS	PERSONNEL OK - - - - - LL
NEED CLIMBERS - - - - - O	ABLE TO RIDE HORSE - - - - - 2
NEED DRINKING WATER - - - - - U	NEED STRETCHER CREW - - - - 3
NEED FOOD - - - - - F	BROKEN LEG - - - - - 4
NEED RADIO WITH BATTERIES - - - R	BROKEN ARM - - - - - 5
NEED BATTERIES FOR RADIO - - - RR	BROKEN BACK - - - - - 6
NEED HAND PUMP - - - - - P	HEAD INJURY - - - - - 7
NEED POWER PUMP OUTFIT - - - - PP	PUNCTURE WOUND - - - - - 8
	UNABLE TO DIAGNOSE - - - - - 9
	RECEIVED MESSAGE--WAVE STREAMER

PLANE-TO-GROUND SIGNALS

"RECEIVED MESSAGE" - WAVE STREAMER OR ROCK PLANE.
 "WILL DROP MESSAGE" - GUN MOTOR THREE TIMES.
 "FIRE HERE" - PLANE CIRCLES THREE TIMES.

SIGNALS SHOULD BE 2 BY 7½ FEET OR LARGER. DO NOT CHANGE UNTIL PILOT ACKNOWLEDGES SIGNAL BY ROCKING PLANE. (REMOVE SIGNAL AFTER EMERGENCY IS OVER.)

GENERAL INSTRUCTIONS

GROUND PARTY CAN BEST ATTRACT SEARCHING AIRCRAFT BY USE OF DEVICES SUCH AS MIRRORS, SMOKES, OR ANIMATED MOVEMENTS. ONCE LOCATED, THE PARTIES CAN USE THE CODES AND SUGGESTIONS LISTED. IF GROUND PARTY HAS NO MARKER, MOVE AROUND IN OPEN SO PILOT CAN SEE YOU.

ALL FOREST SERVICE AIRPLANES HAVE SIGNAL STREAMERS WHICH CAN BE DROPPED TO GROUND MEN WHO ATTRACT THE PLANE'S ATTENTION BUT HAVE NO MEANS OF MAKING GROUND SYMBOLS. THE GROUND SYMBOLS CAN BE MADE FROM PANEL MATERIAL DROPPED FROM PLANES, OR OTHER DEVICES CAN BE USED TO FORM THE EMERGENCY CODE SYMBOLS SUCH AS: ROLLED PAPER, NEWSPAPER, FRESH CUT PEELED POLES, ROCKS, SCRAPED GRASS COVER, OR OTHER SIMPLE METHODS.

A MAN STANDING UPRIGHT WITH HANDS CLASPED ABOVE HEAD WILL BE CONSIDERED O.K.

IF NO OTHER SIGNALS ARE GIVEN, A MAN STRETCHED OUT ON THE GROUND WILL BE ASSUMED TO HAVE INJURIES TOO SEVERE TO PERMIT UNAIDED MOVEMENTS.

PROVIDE AS MUCH COLOR CONTRAST AS POSSIBLE BETWEEN MATERIAL USED FOR SYMBOLS AND BACKGROUND AGAINST WHICH SYMBOLS ARE EXPOSED

DOZER CREW SIGNALS



STOP. BACK AND FORTH, WAIST HIGH, SWINGING MOTION.



COME AHEAD. UP AND DOWN IN FRONT OF SPOTTER, FROM WAIST TO ARM'S LENGTH ABOVE HEAD.



TURN. SWING FLAG OR LIGHT ON SIDE TO WHICH OPERATOR IS TO TURN.



REVERSE OR BACKUP. FULL CIRCLE IN FRONT OF THE SPOTTER.



CAUTION. WAVE FLAG OR LIGHT IN HALF CIRCLE AT ARM'S LENGTH ABOVE HEAD.



ATTRACT OPERATOR'S ATTENTION. MAY ALSO USE ONE BLAST ON A POLICE WHISTLE OR OTHER SUITABLE SUBSTITUTE.



SIGNALS GIVEN BY OPERATOR

CAN'T SEE SPOTTER
GUN MOTOR TWICE

WANT DOZER HELPER TO COME TO DOZER
GUN MOTOR ONCE

HELICOPTER SIGNAL SYSTEM

Ground-to-air signals



Land here



Yes



No



Need help



Wind direction (one hand, back to wind)

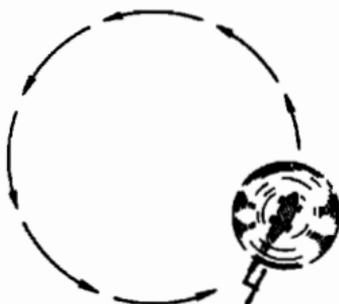


Clear (salute)



Cut engine (throat-cutting motion)

Air-to-ground signals



Indicate wind direction (circle)

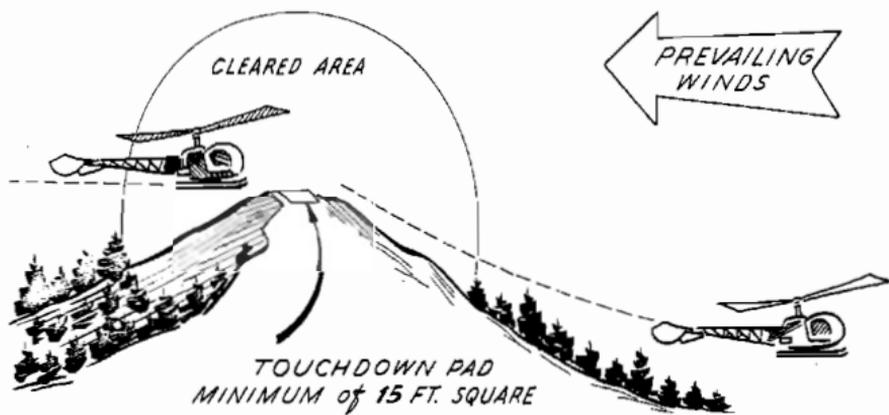


No (yaw back and forth)



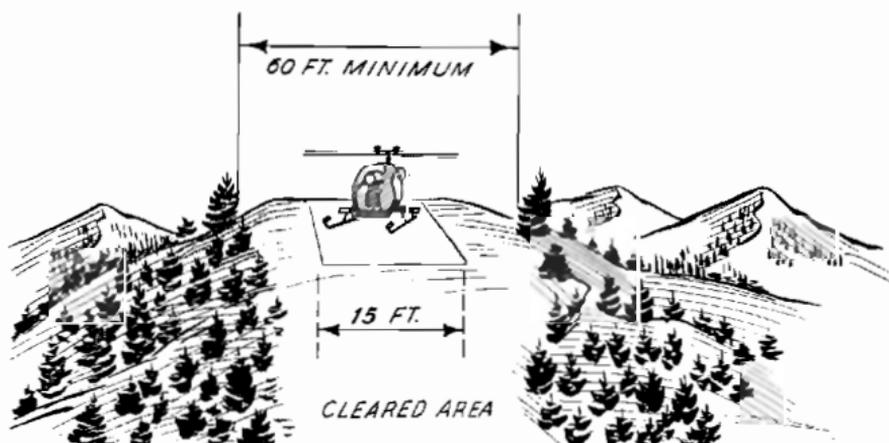
Yes (pitch up and down)

TYPICAL HELISPOT
SIDE VIEW



HANG STREAMER TO INDICATE WIND

FRONT VIEW



RADIO CODE

TEN-CODE

- 10-1 RECEIVING POORLY.
- 10-2 RECEIVING WELL.
- 10-3 Stop transmitting.
- 10-4 OK - ACKNOWLEDGMENT
- 10-5 Verbal repeat.
- 10-6 STANDBY (WILL CALL).
- 10-7 OUT OF SERVICE (RADIO TURNED OFF) _____ MINUTES.
- 10-8 IN SERVICE (RADIO TURNED ON).
- 10-9 Repeat, beginning with _____.
- 10-11 Slow up (talking too fast).
- 10-13 Transmit weather information.
- 10-19 Return to your station, or am returning.
- 10-20 WHAT IS YOUR LOCATION?
- 10-25 Do you have contact with _____?
- 10-33 Emergency traffic at this station.
- 10-36 Correct time.

FOUR-CODE

- 4-1 All clear - no fires.
- 4-2 What is, or this is, the burning index.
- 4-3 Leaving base on patrol flight.
- 4-4 Arrived base on patrol flight, or returning to base from patrol flight.
- 4-5 TURN ON AUTOMATIC REPEAT.
- 4-6 Turn off automatic repeat.
- 4-7 I HAVE FIRE TRAFFIC, OR DO YOU HAVE FIRE TRAFFIC?
- 4-8 Transmit short test call.
- 4-9 What do you have to report?
- 4-10 Take my subsistence order.
- 4-11 EMERGENCY FIRE CALL.
- 4-12 Call my home.
- 4-13 Arrived at scene of fire.
- 4-14 Can handle fire.
- 4-15 Fire under control.
- 4-16 ROUTINE CHECK-IN.
- 4-17 We have no traffic for you.
- 4-97 HOW ARE YOU RECEIVING ME?

PHONETIC ALPHABET

A - Alpha	G - Golf	M - Mike	S - Sierra	Y - Yankee
B - Bravo	H - Hotel	N - November	T - Tango	Z - Zulu
C - Charlie	I - India	O - Oscar	U - Uniform	
D - Delta	J - Juliett	P - Papa	V - Victor	
E - Echo	K - Kilo	Q - Quebec	W - Whiskey	
F - Foxtrot	L - Lima	R - Romeo	X - Xray	

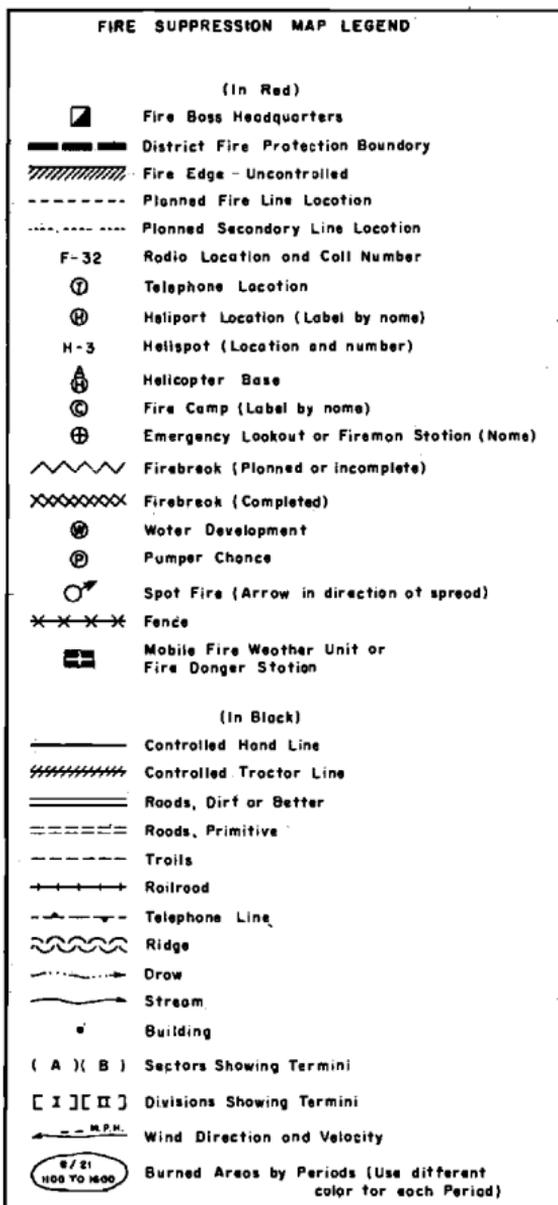


Figure 15

Part VII

R1-5120-34 (Revised 4/68)

CATALOG OF EQUIPMENT, SUPPLIES, AND
MANPOWER AVAILABLE FOR FIRE SUPPRESSION
(Reference FSM 5122.14a)

It is essential that men, equipment, and supplies be dispatched accurately and rapidly to meet fire suppression needs. The primary objective is to get the proper facilities in the correct amounts to the right place in the least possible time.

This catalog was prepared to provide an index of facilities available and expedite ordering procedures. Use of item number and standard terminology will help avoid confusion and reduce errors.

Following are some general guidelines for ordering different categories of facilities: Order general equipment and food supplies from appropriate warehouse. Air Service Requests are processed by the Aerial Fire Depot; specify jumper dispatcher, retardant dispatcher or air cargo. Requests for airplanes and helicopters are processed by the Regional Air Operations Officer. Order manpower and special equipment items from the Regional Fire Coordinator. All orders should be through proper channels.

In order to avoid shortages or duplications, order from the catalog whenever possible. A standard ordering form, R1-6310-21, Fire Camp Order and Inventory Sheet, is also available and should be used.

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PART I - COMPLETE CAMP UNITS AND STANDARD UNITS

Item No.	Name of Unit	Description	Number of Men			
			50	100	150	200
A-1	Initial camp truck delivery (Specify for number of men.)	F-1 Pulaski toolbox	2	4	6	8
		F-4 Ax bundle	1	2	3	4
		C-20 Timerecorder and fire boss desk	1	1	2	2
		F-16 Headlight and toolbox	1	2	3	4
		F-2 Shovel sack	2	4	6	8
		C-3 Sleeping bags, kapok	9	18	27	36
		F-11 Headlight carton	1	2	3	4
		F-10 Battery carton	2	4	6	8
		C-23 Gasoline box	1	2	3	4
		F-32 Fuses	1	1	1	1
		F-8 Canteen package	4	8	13	17
		C-22 Lister bag	1	1	2	2
		C-21 Camp officer accessory box	1	1	1	1
		C-26 Commissary box	1	2	3	4
		F-15 Chain saw	2	4	6	8
		C-15 Camp stove, propane, with fly	1	1	2	2
		C-17 Propane tank, 100-pound	4	4	8	8
		C-25 Tool grinding outfit	1	1	1	1
		C-28 Generator	1	1	1	1
		Gas, pre-mix, gallon	10	10	15	15
		Gas, unmixed, gallon	10	10	15	15
		Oil, quart	4	4	6	6
		C-31 Frozen breakfast	60	120	180	240
		C-33 Frozen dinner	60	120	180	240
		C-32 Frozen lunch	100	200	300	400
		C-34 Accessory package for frozen meals	2	4	6	8
C-35 Coffee package	2	4	6	8		
C-14 Steam kettle	2	4	6	8		

ORDER CAMPS FOR GOING FIRES ONLY.
DO NOT ORDER FOR FOREST CACHES.

PART I - COMPLETE CAMP UNITS AND STANDARD UNITS (Con.)

Item No.	Name of Unit	Description	Number of Men			
			50	100	150	200
*A-2	Initial camp - air drop (Specify for number of men.)	F-1 Pulaski toolbox	2	4	6	8
		F-4 Ax bundle	1	2	3	4
		C-20 Timerecorder and fire boss desk	1	1	2	2
		F-16 Headlight and toolbox	1	2	3	4
		F-2 Shovel sack	2	4	6	8
		C-3 Sleeping bags, kapok	9	18	27	36
		C-16 Stove and fly bundle	2	3	4	5
		F-11 Headlight carton	1	2	3	4
		C-23 Gasoline box	1	2	3	4
		F-32 Fusees	1	1	2	2
		F-10 Battery carton	2	4	6	8
		F-8 Canteen package	4	8	13	17
		C-22 Lister bag	1	1	2	2
		C-18 Fire irons	2	2	3	4
		F-33 Cargo retriever kit	1	1	1	1
		C-21 Camp officer accessory box	1	1	1	1
		C-26 Commissary box	1	2	3	4
		F-15 Chain saw	2	4	6	8
		Gas, pre-mix, gallon	10	10	15	15
		C-34 Accessory package for frozen meals	2	4	6	8
		C-32 Frozen lunch	100	200	300	400
		C-31 Frozen breakfast	60	120	180	240
		C-33 Frozen dinner	60	120	180	240
C-14 Steam kettle	2	4	6	8		
C-35 Coffee package	2	4	6	8		

*Items available only from Missoula.

PART I - COMPLETE CAMP UNITS AND STANDARD UNITS (Con.)

Item No.	Name of Unit	Description
A-3	25-man standard outfit	F-1 Pulaski toolbox - 1 each F-4 Ax bundle - 1 each F-2 Shovel sack - 1 each C-23 Gasoline box - 1 each C-3 Sleeping bags, kapok - 5 bundles F-16 Headlight and toolbox - 1 each F-10 Battery carton - 1 each C-16 Stove and fly bundle - 1 each
	(Specify if for frozen meals or regular rations.)	
	(Any of these items may also be ordered separately.)	
		<u>ITEMS INCLUDED ONLY IF ORDERED FOR USE WITH FROZEN MEALS. (MUST BE ORDERED SEPARATELY)</u>
		C-34 Accessory package for frozen meals - 1 each
		C-35 Coffee package - 1 each
		C-14 Steam kettle - 1 each
		<u>ITEMS INCLUDED ONLY IF ORDERED FOR REGULAR RATIONS. (MUST BE ORDERED SEPARATELY)</u>
		C-8 25-man disposable kitchen and mess outfit for 3 days - 1 each
		C-7 Mess box - 1 each
A-4	25-man supplemental outfit (any of these items may also be ordered separately)	F-1 Pulaski toolbox - 1 each F-2 Shovel sack - 1 each F-11 Headlight carton - 1 each C-3 Sleeping bags - 4 bundles F-10 Battery carton - 1 each
		<u>ITEMS INCLUDED ONLY IF ORDERED FOR USE WITH FROZEN MEALS. (MUST BE ORDERED SEPARATELY)</u>
		C-34 Accessory package for frozen meals - 1 each
		C-35 Coffee package - 1 each
		C-14 Steam kettle - 1 each
		<u>ITEMS INCLUDED ONLY IF ORDERED FOR USE WITH REGULAR RATIONS. (MUST BE ORDERED SEPARATELY)</u>
		C-8 25-man disposable kitchen and mess gear for 3 days - 1 each

PART 2 - FIRE CAMP EQUIPMENT AND FOOD SUPPLIES

Item No.	Unit Name	Description
C-1	Lunch bag	10-pound, cloth
C-2	Sleeping bag	Paper, disposable
C-3	Sleeping bag	Kapok, 1 bundle of 6 bags
C-4	Air mattress	Lightweight, plastic, reusable, but expendable, for use with paper sleeping bag
C-5	Tent	Canvas wall tent, 14- by 16-foot
C-6	Plastic sheet	20- by 100-foot, .004-inch thick
C-7	Mess box	1 mosquito bar, 4 wash basins, 1 scrub brush, 4 canvas buckets, 3 pot cleaners, 1 alarm clock, 2 lantern funnels, 3 lantern generators, 1 lantern wrench, 24 mantles, 2 gas lanterns (2 burner), 1 claw hammer, 1 dish pan, 2 frying pans, 1 meat saw, 25 hand towels, 2 rolls toilet tissue
C-8	25-man disposable kitchen and mess outfit (Specify number of days required.)	Kitchen equipment for 25 men and mess gear for 3 days. If number of days not specified, a 3-day supply will be sent. This unit contains: 25-man disposable mess boiler - 1 each 25-man mess carton - 1 each 25-man 1-day mess gear - 3 each (Not required with frozen meals)
C-9	1-day disposable mess outfit for 25 men (Specify number of days required.)	Mess gear to serve 25 men for 1 day. Contains plates, cups, knives, etc. No cooking equipment included. (Not required with frozen meals)
C-10	1-meal disposable mess outfit for 25 men	Mess gear to serve 25 men for 1 meal. No cooking equipment included. (Not required with frozen meals)
C-11	10-man disposable kitchen and mess outfit (Specify number of days required.)	Complete kitchen cooking equipment for 10 men and mess gear for 3 days. Disposable when return transportation expensive. This unit contains: 10-man outfit (cooking) - 1 each 25-man 1-day mess gear - 1 each (Not required with frozen meals)
C-12	Hot food container	5-gallon large opening can in insulated package
C-13	Hot drink container	5-gallon screw-top can in insulated package
C-14	Steam kettle	30-gallon with 3 racks for preparing frozen meals. Kettles hold 30 meals. Can be reused.
C-15	Camp stove, propane (Specify amount of propane.)	2 5-burner plates, 1 large single burner for heating water, and 1 oven unit, with necessary fittings. Contains 1 each 14- by 16-foot fly, griddle and double roaster. For roadside use. Requires up to 2 100-pound tanks of propane for a full day of operation.

PART 2 - FIRE CAMP EQUIPMENT AND FOOD SUPPLIES (Con.)

Item No.	Unit Name	Description
C-16	Stove and fly bundle	1 complete Kimmel stove, 1 each 14- by 16-foot fly, and 3 drip pans
C-17	Propane	100-pound cylinder
C-18	Fire irons	2-inch and 1-1/2-inch pipe, telescoped for use as grates over open pit fire
C-19	Meat slicer	Hand operated - 1 each
C-20	Timerecorder and fire boss desk	Supplies, forms, and organization charts to facilitate supervision and timekeeping on large fires. Includes 2 each 10 by 12 tent and 2 each 14 by 16 foot fly.
C-21	Camp officer accessory box	2 hammers, wire, saw, assorted nails, signs, rope, funnels, 6 files, 1 screwdriver, 2 pliers, 1 side cutter, 2 electric lanterns, 2 file handles
C-22	Lister bag	30-gallon with purification tablets - 1 each
C-23	Gasoline box	Contains 12 fusees, 2 gallons lantern gas, 1 timerecorder's kit, 2-quart canteens
C-24	Carborundum grinder	1 each
C-25	Tool grinding outfit, portable	Powered with gasoline engine, with 1 gallon of gasoline (unmixed)
C-26	Commissary box	Contains the following items: 1 dozen pair gloves, canvas 1 dozen pair socks, boot, lightweight 1 dozen pair socks, boot, part wool, medium-weight 1 dozen pair laces, shoe, assorted boot lengths 2 packages needles, sewing 1 pricelist 1 container with padlock and key NOTE: All tobacco will be by special order in quantities to best meet estimated needs. Tobacco is a food item and not to be sold.
C-27	Generator	Heavy duty base camp generator, 6 KVA, on skids, with accessories, extra gas (unmixed) and oil.
C-28	Generator	1 semiportable light plant, 4 KW, with accessories and 5 gallons gas.
C-29	Propane light	Complete with accessories and 20-pound tank of propane sufficient for 55 hours. Maximum of 15,000 candlepower.
C-30	Mobile refer unit	Will be routed from commercial outlets. Specify size, requirements, and accessibility.

PART 2 - FIRE CAMP EQUIPMENT AND FOOD SUPPLIES (Con.)

Item No.	Unit Name	Description
C-31	Frozen breakfast	Individual packet (complete meal in each packet including coffee, juice, and utensils) Menus listed below: 1. Pancakes and Canadian bacon 2. French toast and Canadian bacon 3. Creamed chipped beef 4. Smokies (sausages) with beans Can be used for lunches or supper
		Requires heating
C-32	Frozen lunch	Contains 2 sandwiches (sliced beef and turkey with cheese), fruit, candy bar, juice, accessory packet and lunch sack with tie strings
C-33	Frozen dinner	Individual packet (complete meal in each packet including coffee, juice, and utensils) Menus listed below: 1. Sirloin tips 2. Chicken fricassee 3. Sliced beef 4. Sliced turkey and dressing 5. Pot roast or beef 6. Beef stew
		Requires heating
C-34	Accessory package for frozen meals	1 boiler 3 cartons book matches 3 rolls tissue, toilet 10 bars hand soap 30 each hand towels 5 each dish towels 2 each lanterns, 1-burner Coleman with accessory, 12 mantles, 3 generators, 1 wrench, and 1 funnel 4 wash basins 1 alarm clock 1 mosquito bar 2 files, 8-inch flat 4 buckets, canvas
C-35	Coffee package	1 5-gallon can, 2 pounds coffee, 50 hot drink cups, 2 cans milk, 1 pound cube sugar, 1 dipper, and 50 plastic spoons. Designed for use with frozen meals.
C-36	Rations, 30-man 1-day	Breakfast and supper. Must be cooked at camp. Order amount and kind of bread desired. Order smokechaser rations (C-37) for lunches.
C-37	Rations, smokechaser	1 meal ration for smokechaser pack and lunch use. (GSA individual fire ration packed 10 rations per case.) Order by number of cases.
C-38	Drinking water	In disposable cans (usually 3 each 5-gallon in one bundle.) Specify amount needed.

PART 2 - FIRE CAMP EQUIPMENT AND FOOD SUPPLIES (Con.)

Item No.	Unit Name	Description																																																																																																																																																	
C-39	Container, water disposable	Plastic, 5-gallon or 15-gallon. Specify size.																																																																																																																																																	
C-40	Timrecorder's kit	Complete in canvas carrying case. Supplies, forms, and organization charts to facilitate supervision and timekeeping on sector size fires.																																																																																																																																																	
C-41	Recommended standard menus (Specify menu number and number of men Example: C-41 (3) 75 men.)	Contains all food supplies needed for 1 day. Five menus available. Can be ordered in multiples of 25. All staples will remain standard for each menu. Lunches not included. See item C-42.																																																																																																																																																	
		<table border="1"> <thead> <tr> <th></th> <th>25 men</th> <th>50 men</th> <th>75 men</th> <th>100 men</th> </tr> </thead> <tbody> <tr> <td>(1) Hamburger</td> <td>15 lbs.</td> <td>30 lbs.</td> <td>45 lbs.</td> <td>60 lbs.</td> </tr> <tr> <td>String beans,</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> #10 can</td> <td>2 each</td> <td>3 each</td> <td>4 each</td> <td>5 each</td> </tr> <tr> <td>Ham, canned or</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> smoked</td> <td>2 each</td> <td>3 each</td> <td>4 each</td> <td>5 each</td> </tr> <tr> <td>(2) Beef tips</td> <td>15 lbs.</td> <td>30 lbs.</td> <td>45 lbs.</td> <td>60 lbs.</td> </tr> <tr> <td>Peas, #10 can</td> <td>2 each</td> <td>3 each</td> <td>4 each</td> <td>5 each</td> </tr> <tr> <td>Bacon, sliced</td> <td>10 lbs.</td> <td>20 lbs.</td> <td>30 lbs.</td> <td>40 lbs.</td> </tr> <tr> <td>(3) Steak, 1-pound size</td> <td>25 lbs.</td> <td>50 lbs.</td> <td>75 lbs.</td> <td>100 lbs.</td> </tr> <tr> <td>Corn, whole kernel,</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> #10 can</td> <td>2 each</td> <td>3 each</td> <td>4 each</td> <td>5 each</td> </tr> <tr> <td>Sausage, link</td> <td>10 lbs.</td> <td>20 lbs.</td> <td>30 lbs.</td> <td>40 lbs.</td> </tr> <tr> <td>(4) Rolled roast</td> <td>12 lbs.</td> <td>25 lbs.</td> <td>35 lbs.</td> <td>50 lbs.</td> </tr> <tr> <td>Carrots, #10 can</td> <td>2 each</td> <td>3 each</td> <td>4 each</td> <td>5 each</td> </tr> <tr> <td>Ham, canned or</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> smoked</td> <td>2 each</td> <td>3 each</td> <td>4 each</td> <td>5 each</td> </tr> <tr> <td>(5) Cube steak</td> <td>18 lbs.</td> <td>36 lbs.</td> <td>54 lbs.</td> <td>72 lbs.</td> </tr> <tr> <td>Tomatoes, #10 can</td> <td>2 each</td> <td>3 each</td> <td>4 each</td> <td>5 each</td> </tr> <tr> <td>Bacon, sliced</td> <td>10 lbs.</td> <td>20 lbs.</td> <td>30 lbs.</td> <td>40 lbs.</td> </tr> <tr> <td>Pancake flour</td> <td>10 lbs.</td> <td>15 lbs.</td> <td>20 lbs.</td> <td>25 lbs.</td> </tr> <tr> <td>Onions, dry</td> <td>2 lbs.</td> <td>4 lbs.</td> <td>6 lbs.</td> <td>8 lbs.</td> </tr> <tr> <td>Potatoes, fresh</td> <td>15 lbs.</td> <td>30 lbs.</td> <td>45 lbs.</td> <td>60 lbs.</td> </tr> <tr> <td>Oranges</td> <td>16 lbs.</td> <td>32 lbs.</td> <td>48 lbs.</td> <td>1 box</td> </tr> <tr> <td>Apples</td> <td>12 lbs.</td> <td>24 lbs.</td> <td>36 lbs.</td> <td>1 box</td> </tr> <tr> <td>Fruit juice, 46 oz.</td> <td>6 cans</td> <td>1 cs.</td> <td>18 cans</td> <td>2 cs.</td> </tr> <tr> <td>Butter, fresh</td> <td>4 lbs.</td> <td>5 lbs.</td> <td>8 lbs.</td> <td>10 lbs.</td> </tr> <tr> <td>Eggs, fresh</td> <td>5 doz.</td> <td>10 doz.</td> <td>15 doz.</td> <td>20 doz.</td> </tr> <tr> <td>Milk, canned, tall</td> <td>12 cans</td> <td>24 cans</td> <td>36 cans</td> <td>48 cans</td> </tr> </tbody> </table>		25 men	50 men	75 men	100 men	(1) Hamburger	15 lbs.	30 lbs.	45 lbs.	60 lbs.	String beans,					#10 can	2 each	3 each	4 each	5 each	Ham, canned or					smoked	2 each	3 each	4 each	5 each	(2) Beef tips	15 lbs.	30 lbs.	45 lbs.	60 lbs.	Peas, #10 can	2 each	3 each	4 each	5 each	Bacon, sliced	10 lbs.	20 lbs.	30 lbs.	40 lbs.	(3) Steak, 1-pound size	25 lbs.	50 lbs.	75 lbs.	100 lbs.	Corn, whole kernel,					#10 can	2 each	3 each	4 each	5 each	Sausage, link	10 lbs.	20 lbs.	30 lbs.	40 lbs.	(4) Rolled roast	12 lbs.	25 lbs.	35 lbs.	50 lbs.	Carrots, #10 can	2 each	3 each	4 each	5 each	Ham, canned or					smoked	2 each	3 each	4 each	5 each	(5) Cube steak	18 lbs.	36 lbs.	54 lbs.	72 lbs.	Tomatoes, #10 can	2 each	3 each	4 each	5 each	Bacon, sliced	10 lbs.	20 lbs.	30 lbs.	40 lbs.	Pancake flour	10 lbs.	15 lbs.	20 lbs.	25 lbs.	Onions, dry	2 lbs.	4 lbs.	6 lbs.	8 lbs.	Potatoes, fresh	15 lbs.	30 lbs.	45 lbs.	60 lbs.	Oranges	16 lbs.	32 lbs.	48 lbs.	1 box	Apples	12 lbs.	24 lbs.	36 lbs.	1 box	Fruit juice, 46 oz.	6 cans	1 cs.	18 cans	2 cs.	Butter, fresh	4 lbs.	5 lbs.	8 lbs.	10 lbs.	Eggs, fresh	5 doz.	10 doz.	15 doz.	20 doz.	Milk, canned, tall	12 cans	24 cans	36 cans	48 cans
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PART 2 - FIRE CAMP EQUIPMENT AND FOOD SUPPLIES (Con.)

Item No.	Unit Name	Description			
C-41 (con.)		<u>25 men</u>	<u>50 men</u>	<u>75 men</u>	<u>100 men</u>
	Cheese, sliced	3 lbs.	5 lbs.	8 lbs.	10 lbs.
	Bread, 1-1/2 pound loaves	5 each	10 each	15 each	20 each
	Jam, #2 can	2 each	3 each	4 each	5 each
	Coffee	4 lbs.	6 lbs.	8 lbs.	10 lbs.
	Sugar, cubed	7 lbs.	13 lbs.	20 lbs.	25 lbs.
	Pepper	2 oz.	4 oz.	6 oz.	8 oz.
	Salt	1 lb.	2 lbs.	3 lbs.	4 lbs.
	Cooking oil	2 qts.	3 qts.	4 qts.	5 qts.
	Catsup	2 btls.	3 btls.	4 btls.	5 btls.
	Matches, farmer	2 boxes	2 boxes	2 boxes	2 boxes
	Flour	3 lbs.	5 lbs.	8 lbs.	10 lbs.
	Rolled oats	3 lbs.	5 lbs.	8 lbs.	10 lbs.
	Soap, toilet	6 bars	8 bars	10 bars	12 bars
	Syrup	1 gal.	2 gals.	3 gals.	4 gals.
	Toilet tissue	6 rolls	6 rolls	9 rolls	12 rolls
	Salad dressing	4 qts.	5 qts.	6 qts.	7 qts.
	Lettuce	6 heads	12 heads	18 heads	1 case
	Tomatoes, fresh	9 each	18 each	1 lug	1 lug
	Cigarettes, assorted	3 ctns.	6 ctns.	9 ctns.	12 ctns.
C-42	Lunches	Use item C-37, smokechaser rations, or C-32, frozen lunches. If necessary to make at fire camp, the following menu can be used:			
	(If possible, specify number of men.)	3 sandwiches, (1 jam and 2 meat), wrapped in waxed paper, 1 orange, 1 apple, cookies, 1 candy bar			
		<u>25 men</u>	<u>50 men</u>	<u>75 men</u>	<u>100 men</u>
	Bread, 1-1/2 pound loaves	10 each	20 each	30 each	40 each
	Butter	4 lbs.	8 lbs.	12 lbs.	16 lbs.
	Cookies, assorted	5 lbs.	10 lbs.	15 lbs.	20 lbs.
	Bags, paper, #8	50 each	100 each	150 each	200 each
	Dining packet (utensils, etc.)	25 each	50 each	75 each	100 each
	Lunch meat, sliced	6 lbs.	12 lbs.	18 lbs.	24 lbs.
	Jam, #2 can	2 each	3 each	4 each	5 each
	Candy bars	25 each	50 each	75 each	100 each
	Sacks, cloth lunch	30 each	60 each	90 each	120 each

PART 3 - FIRE LINE EQUIPMENT

Item No.	Name of Unit	Description
F-1	Pulaski toolbox	16 pulaskis
F-2	Shovel sack	16 shovels, No. "0"
F-3	Ax box	10 3-1/2 pound doublebitted axes
F-4	Ax bundle	2 3-1/2 pound doublebitted axes, sheathed
F-5	Hand spray pump	1 hand spray pump, 1 5-gallon back pack water bag, and 1 hose, complete
F-6	Water bag	2-gallon canvas
F-7	Water bag	5-gallon canvas, back pack
F-8	Canteen, package	12 1-quart, with cover
F-9	Headlights	Headset, flashlight, complete with batteries
F-10	Battery carton	240 each, batteries, flashlight
F-11	Headlight carton	30 headsets, flashlight, 6 files, 8-inch MB, 4 pecksacks, 6 file handles, 6 ax stones, 2 5-gallon water bags, and 1 24-unit first aid kit
F-12	Torch box	1 propane tank with burner, tools, equipment to refill and 5 hours fuel supply
F-13	Safety hat package	25 safety hardhats
F-14	Smokechaser's pack	Complete tools and equipment for 1 man with 2 days rations on a pack frame
F-15	Chain saw	1 portable chain saw with 18-inch blade boxed with chaps, accessories, gas and oil for 8 hours operation
F-16	Headlight and toolbox	6 2-gallon water bags, 4 5-gallon water bags, 30 headsets, flashlight, 12 8-inch files, 6 file handles, 24-unit medicine kit, 4 packages paper towels (250 per package), 6 individual first-aid kits, 1 padlock, 1 pair pliers, 2 hand spray pumps, 1 screw-driver, 4 pack sacks, 6 ax stones, 2 rolls plastic flagging
F-17	Pump unit	Pacific Pump, standard type Y, with accessory box, 10 gallons of gas (premixed), 1600 feet of 1-1/2-inch linen hose (70 pounds per bundle of 400 feet)
F-18	Pump unit, lightweight	Pacific Pump, standard type 5A, with accessories, 5 gallons of gas (premixed), 600 feet of 1-inch linen hose
F-19	Pump unit, lightweight	Gorman-Rupp Pump, with accessories, 5 gallons of gas (premixed), 600 feet of 1-inch linen hose
F-20	Pump	High volume low pressure pump for filling tanker, with accessories, 100 feet of 2-1/2-inch hose, and 10 gallons of gas
F-21	Slip-on tanker unit	Complete unit with 1-inch high pressure hose, various sizes available, 75-gallon, 150-gallon, 200-gallon, and 500-gallon. (Specify size.)

PART 3 - FIRE LINE EQUIPMENT (Con.)

Item No.	Name of Unit	Description
F-22	Mop-up kit 6-man	All adapters, nozzles, and applicators needed to operate 6 garden hose lines from 1-1/2-inch pumper hose line. Complete with 6 50-foot lengths of garden hose
F-23	Hose adapter	1-1/2-inch to 1-inch male hose reducer
F-24	Garden hose	Garden hose, 50-foot length, specify size
F-25	Hose, linen, 1-inch	600 feet per bundle, with packboard
F-26	Hose, linen, 1-1/2-inch	400 feet per bundle, with packboard
F-27	Gravity sock	42 inches by 8 inches, with 1-1/2-inch male outlet
F-28	Tank, water	900-gallon rubber (sausage) type, with accessories that will permit 1-1/2-inch hose attachments. For relay or storage purposes. NOT FOR DRINKING WATER USE.
F-29	Relay tank	Portable, collapsible type, 75 gallons, fittings, valves, nozzles, etc., should be ordered as separate items
F-30	Dozer light kit	3 tractor lights, with accessories and batteries. (Uses 24 #6 ignitor batteries.)
F-31	Dozer skid pan	For transportation of fire supplies over dozer fire lines. Complete with hitch attachment. Can be transported on 1-ton flat bed or larger truck. (Usually obtained at the Forest level.)
F-32	Fusees	10 minute backfire fusees, 1 case of 72 fusees
*F-33	Cargo retrieving kit	100 feet let-down rope, climber's spurs, belt and strap for climbing, and buzzer. Free fall item from Missoula Warehouse.
F-34	Cross cut saw package	2 5-1/2- or 6-foot saws, with 2 single jack hammers, 4 each cross cut saw handles, 3 each felling wedges
F-35	Plastic flagging	1 roll

*Items available only from Missoula.

PART 4 - MISCELLANEOUS EQUIPMENT AND TRANSPORTATION

Item No.	Name of Unit	Description
M-1	Oxygen kit	Small medical oxygen kit for emergency use
M-2	First-aid kit	24-unit standard first-aid kit
M-3	First-aid kit	10-unit standard first-aid kit, with canvas belt case
M-4	First-aid kit	Pocket first-aid kit, individual
M-5	Snake bite kit	Picket type
M-6	Bee sting medicine	To counteract effect of multiple bee stings or for people who are hypersensitive to bee stings. Includes one medihaler and 25 Isuprel tablets.
*M-7	Rescue facilities available (Can be paraded.)	Smokejumper evacuation team (available for summer or winter rescue) Smokejumper helispot clearing crew (any number needed) Helispot clearing kit (with or without powersaws) Smokejumper first-aid specialists Demerol Plasma (normal and albumin) Wheeled evacuation litter (needs 10-man crew) Fiberglass mountain rescue toboggan (needs at least 6 men) Fracture board Traction splint Multiple casualty medical kit (contains sufficient medication, bandages, etc., to care for 20 to 25 casualties with first-aid treatment)
M-8	Stokes litter	Splint-type stretcher for use on helicopter. Specify if helicopter clamps are needed
M-9	Belt weather kit	Kit for taking Basic Fire Weather measurement
M-10	Fire danger station, portable	Complete fire danger station, one package
M-11	Weather unit, mobile (U.S. Weather Bureau)	On pickup truck with fire weather forecaster. This unit must be special ordered through regional fire coordinator. These units are fully equipped to give fire weather forecasts on any project fire. If these units are unavailable, fire weather "spot" forecasts should be used.
M-12	Weather unit, portable (U.S. Weather Bureau)	Weather unit similar to M-11 for helicopter transport to back country fires. Based at Boise, Idaho. Fire weather forecaster will come with this unit.
M-13	Fire shelter	Individual fire shelter, with belt pouch
M-14	CO ² fire extinguisher	15 or 20 pound CO ² fire extinguisher, for use at helispots, fueling station, etc.
M-15	Rope	State size and amount
M-16	Barrel pump	Hand operated pump for refueling from 55-gallon barrel

PART 4 - MISCELLANEOUS EQUIPMENT AND TRANSPORTATION (Con.)

Item No.	Name of Unit	Description
M-17	Jeep can	5-gallon steel can. Specify if spouts needed and amount
M-18	Knapsack	Carrying sack, with shoulder straps, 14 x 17 inches
M-19	Saddle, pack, decker	Fully equipped for use with 2 (1 set) mantas, 2 cargo ropes, 1 pad and 1 blanket
M-20	Saddle, riding	Includes saddle, bridle, and blanket
M-21	Pack cover manta	6- by 10-foot canvas pack mantas. Order cargo rope separately. (See item M-15)
M-22	Thermofax	Complete copying machine, with paper. ELECTRICALLY OPERATED.
M-23	Cargo net	1 helicopter cargo net, with swivel
M-24	Swivel	Swivel for use with helicopter sling loads
M-25	Base heliport kit	1 stokes litter, 3 cargo nets, with swivels, 6 wind socks, 1 5-pound CO ² fire extinguisher, 1 forms kit, 1 accessory kit, with goggles, vest, etc.
M-26	Helicopter sling bucket	140-gallon fiberglass sling bucket. Gallonage adjustable from 30 to 100 gallons. Helicopter must be equipped to handle.
	Wire dispenser	See item R-18
	Stokes litter	See item M-8

TRANSPORTATION

Pack stock is normally supplied or rented at the Forest level. If Forest needs additional stock, they should be ordered through the Regional Coordinator. Stock furnished will normally come equipped with saddles and 1 set of mantas, with ropes. Feed requirements will be 30 pounds of hay and 8 pounds of oats per animal day.

All trucks, busses and like ground transportation is normally supplied from existing Forest-owned equipment or rental outlets. If additional off-Forest equipment is required, it must be obtained through the Regional Coordinator.

All air transportation, helicopters, personnel and cargo airplanes will be obtained through the Regional Air Officer. See appendix, page 21, for listing of aircraft types and accessories normally available in Region 1.

PART 5 - COMMUNICATION EQUIPMENT

Item No.	Unit Name	Description
*R-1	Radio unit 1 - sector fire camp high band #1	5 FM light portables, with batteries, 1 heavy portable FM radio with batteries. Will equip a 1-sector fire camp. HIGH BAND #1. (SPF radio will not be furnished with this unit unless specified. If specified it will be on 3261 KC.) <u>DROP ONLY AS LAST RESORT</u>
*R-2	Radio unit 1 - sector fire camp high band #2	5 FM light portables, with batteries, 1 heavy portable FM radio with batteries, will equip a 1-sector fire camp. HIGH BAND #2. (SPF radio will not be furnished with this unit unless specified. If specified it will be on 3261 KC.) <u>DROP ONLY AS LAST RESORT</u>
*R-3	Radio unit 1 - sector fire camp low band	5 FM light portables, with batteries, 1 heavy portable FM radio with batteries, will equip a 1-sector fire camp. LOW BAND. (SPF radio will not be furnished with this unit unless specified. If specified it will be on 3261 KC.) <u>DROP ONLY AS LAST RESORT</u>
*R-4	Radio communication unit, base camp, high band #1	1 FM heavy portable radio, 10 FM light portable radios with batteries, 1 power megaphone. Will equip a 2-sector base camp. HIGH BAND #1. <u>DROP ONLY AS LAST RESORT</u>
*R-5	Radio communication unit, base camp, high band #2	1 FM heavy portable radio, 10 FM light portable radios with batteries, 1 power megaphone. Will equip a 2-sector base camp. HIGH BAND #2. <u>DROP ONLY AS LAST RESORT</u>
*R-6	Radio communication unit, base camp, low band	1 FM heavy portable radio, 10 FM light portable radios with batteries, 1 power megaphone. Will equip a 2-sector base camp. LOW BAND. <u>DROP ONLY AS LAST RESORT</u>
*R-7	Radio unit sector high band #1	5 FM light portables with batteries. Will equip sector unit working from camp already equipped with radios. HIGH BAND #1. <u>DROP ONLY AS LAST RESORT</u>
*R-8	Radio unit sector high band #2	5 FM light portables with batteries. Will equip sector unit working from camp already equipped with radios. HIGH BAND #2. <u>DROP ONLY AS LAST RESORT</u>
*R-9	Radio unit sector low band	5 FM light portables with batteries. Will equip sector unit working from camp already equipped with radios. LOW BAND. <u>DROP ONLY AS LAST RESORT</u>
*R-10	Radio unit remote control	1 remote control unit with 1/2 mile twisted pair of wires. This unit will work on any standard Motorola heavy portable. RADIO NOT FURNISHED. Order additional wire as needed. (See item F-16) <u>DROP ONLY AS LAST RESORT</u>

*Items available only from Missoula.

PART 5 - COMMUNICATION EQUIPMENT (Con.)

Item No.	Unit Name	Description
*R-11	Radio unit repeater	Repeater unit with batteries. <u>Works on high band only.</u> Unit contains 200 feet of cable. <u>DROP ONLY AS LAST RESORT</u>
*R-12	AM base camp unit	1 AM unit, operating on 3211 KC to 3357.5 KC. 1 generator with utility box and AC extension cord. <u>CAN NOT DROP</u>
*R-13	Extra radio Specify	Light or heavy portables, with batteries. Either high band #1 or #2, or low band. Specify to match existing units on fire. <u>DROP ONLY AS LAST RESORT</u>
*R-14	Radio SPF	Radio, SPF set on 3261 KC, with batteries. <u>DROP ONLY AS LAST RESORT</u>
*R-15	Radio batteries (sets)	Order battery sets by radio type number.
*R-16	Emergency wire	Twisted pair, emergency wire, in 1/2-mile spool with packboard dispenser for use with remote controls and telephones.
*R-17	Telephone unit	1 field telephone complete with all accessories. Order wire as needed. (See item F-16.)
*R-18	Wire dispenser, helicopter	Wire dispenser for stringing telephone or remote wire by helicopter, with 1 mile wire.
*R-19	Megaphone	Battery operated megaphone, with batteries.

*Items available only from Missoula.

PART 6 - FIREFIGHTING PERSONNEL TEAMS AND UNITS

Top Fire Overhead Team	Available in class 1 and class 2 teams in following positions: 1 fire boss, 1 line boss, 1 plans chief, 1 service chief, 1 finance chief.
Division Team	Consists of 1 division boss and 3 sector bosses. Can be ordered with squad bosses if needed. Specify number of squad bosses.
Finance Team	Consists of 1 finance chief, 1 claims officer, 1 obligations officer, 1 compensation for injury officer, 1 time officer, 3 timekeepers
Smokechaser Team	2 smokechasers. Come equipped with personal gear only.
Evacuation Team (M-7)	8 smokejumpers with stretcher, first-aid supplies, blood plasma, demerol, splints, goosedown blanket. May be modified to include only equipment and skilled leader. Also equipped for winter rescue.
Helispot Clearing Team (M-7)	2 to 8 smokejumpers with trained leader, chain saws and helispot clearing kit. Give best available data on difficulty of chance, etc.
Smokejumpers	In addition to usual jump use, may be ordered as smokechasers, squads of 6-15 men with squad boss, large crews of 16-32 men with crew boss and 2 squad bosses, sector crews 32-100 men with sector boss, crew bosses and squad bosses. Come fully equipped with line tools and food for 2 days. Consider plane capacity (Appendix page 21) when ordering. Fill out Form RI-5760-2, Request for Smokejumpers, before ordering.
Interregional Crews	Will be first line of call. Consists of 1 crew boss, 3 squad bosses, 21 crewmembers. WILL NOT COME WITH TOOLS UNLESS SPECIFIED.
Organized Crews	Will be second line of call. Indians, Spanish-Americans, etc. Consists of 1 liaison officer, 1 crew boss, 3 squad bosses, 18-21 crewmembers. WILL NOT COME WITH TOOLS.
Unorganized, pickup labor	Will be last line of call. Will come with qualified crew boss and 21-24 crewmembers. Squad bosses should be furnished by ordering unit. Allow at least 4 hours for hiring 2 crews.

PART 7 - APPENDIX

Fire Retardants for Air Tankers

From	Aircraft	Tank capacity	Speed (mph)	Fuel octane	Retardant at base
Missoula	TBM	600	180	100	Phos-Chek and Firetrol
	B-26	1,000	200	100	
	B-17	2,000	180	100	
Coeur d'Alene	TBM	600	180	100	Firetrol
Helena	TBM	600	180	100	Firetrol
Grangeville	TBM	600	180	100	Phos-Chek
Kalispell	Has established base for handling all types air tankers				Phos-Chek
West Yellowstone	Has established base for handling all types air tankers				Firetrol

Gallage may be reduced due to unfavorable air conditions.

A portable retardant mix plant is available from Missoula for transport to any point in the Region.

Henry 205
9-10 men

Comparative Specifications for Helicopters

Aircraft	Bell G-3	Bell G-3B	Bell G-3B-1	Bell Jet Ranger	Bell 204B	Hiller 12E	Hiller E-4	Hiller FH-1100
Empty weight	1740	1760	1800	1300	4600	1700	1775	1400
*Payload with full gas	550	600	600	840	2350	500	500	750
Passenger capacity	2	2	2	4	9	2	3	4
Speed	80	85	85	120	130	85	90	120
Fuel/hour	18	18	18	28	70	18	18	28
Fuel octane	100-130	100-130	100-130	JP-4	JP-4	80-87 100-130	100-130	JP-4
Fuel capacity	41	41	57	76	165	46	46	66

*Cabin capacity is less than external payload.

Available accessories:

- M-23 Cargo nets with swivel
 - M-26 Sling bucket for water or retardant (self filling) (helicopter must be equipped for use)
 - R-18 Wire dispenser
 - M-8 Stokes litter with clamps
 - M-25 Base heliport kit includes:
 - 1 stokes litter, 3 cargo nets with swivels, 6 wind socks,
 - 1 5-pound CO₂ fire extinguisher, 1 kit of forms, 1 accessory kit (goggles, etc.)
- Helicopter fuel - specify octane rating

PART 7 - APPENDIX (Con.)

Air Transportation

Aircraft available	Capacity				Approximate speed (mph)
	Passengers	Jumpers	Air freight pounds	Para cargo pounds	
DC-6	81	0	20,000	0	250
DC-4 (C-54)	65	0	14,000	0	190
C-46	48	0	10,000	9,000	190
DC-3 (C-47)	25	16	5,000	4,500	170
DC-2	14	12	4,000	3,500	170
Twin Beech	6	3	1,300	1,000	160
Ford	12	8	3,000	2,800	90
Travelair	5	2	1,000	800	90
Comanche	3	0	0	0	150
Cessna 180	3	0	0	0	150
Cessna 206	4-5	0	1,100	0	160
Aero Commander	4-5	0	800	0	180
T-34	1	0	0	0	140

PART 7 - APPENDIX (Con.)

Comparative Specifications of Industrial Track-Type Tractors

Make and model	Approximate weight		Fuel gallons per hour	Tank capacity	
	Tractor	Dozer without rear power control unit			Total
<u>I.H.C.</u>					
TD-24 Conv.	40,000	10,600	50,600	5.0 - 7.0	135
TD-24	39,670	10,600	50,270	5.0 - 7.0	85
TD-18	28,400	5,775	34,175	3.0 - 5.0	75
TD-14	21,000	3,425	24,525	2.5 - 4.0	60
TD-9	11,450	3,600	15,050	2.5 - 3.0	33
<u>Caterpillar</u>					
D-9 Conv.	56,700	12,535	69,235	7.0 - 10.0	157
D-9	56,800	12,535	69,335	7.0 - 10.0	157
D-8 Conv.	39,900	7,415	47,315	5.0 - 7.0	118
D-8	39,100	7,415	46,515	5.0 - 7.0	69
D-7	26,000	5,240	31,240	3.0 - 5.0	70
D-6	17,600	3,965	21,565	2.5 - 4.0	48
D-4	11,000	2,970	13,970	2.0 - 2.5	30
<u>Allis-Chalmers</u>					
HD-21 AC	44,000	8,600	52,600	5.0 - 7.0	149
HD-16 A	31,500	6,400	37,900	3.0 - 5.0	100
HD-16 AC	31,600	6,400	38,000	3.0 - 5.0	100
HD-11	20,500	4,400	24,900	5.0 - 7.0	60
HD-6	12,400	2,895	15,295	2.0 - 2.5	40

Military Equipment and Personnel

Specialized equipment, personnel, and teams are available under certain conditions from the National Guard, Air Force, Army, Army Reserve, and ROTC units. Order through Regional Fire Coordinator.

Some items to consider are: mobile kitchens with staff, portable shower units, communication units, trucks, water trailers, helicopters, medic teams, and military police.

Sunrise and Sunset (Mountain Daylight Saving Time)

Latitude 46°55' N.
Longitude 114°05' W.

Missoula, Montana

Day of month	May		June		July		August		September		October	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	0621	2046	0545	2123	0544	2135	0615	2109	0655	2016	0735	1916
2	0620	2047	0544	2124	0545	2134	0616	2108	0657	2014	0736	1914
3	0617	2049	0544	2125	0546	2134	0617	2106	0658	2012	0738	1912
4	0616	2050	0543	2126	0547	2134	0619	2105	0659	2010	0739	1910
5	0616	2051	0543	2126	0547	2133	0620	2103	0659	2009	0740	1908
6	0613	2053	0542	2127	0548	2133	0621	2102	0701	2007	0740	1907
7	0612	2054	0542	2128	0549	2133	0623	2100	0703	2005	0742	1905
8	0611	2055	0542	2129	0550	2132	0623	2059	0704	2003	0743	1903
9	0609	2057	0541	2129	0550	2132	0626	2057	0705	2001	0745	1901
10	0608	2058	0541	2130	0551	2131	0626	2056	0706	1959	0747	1859
11	0606	2059	0541	2131	0552	2130	0628	2054	0708	1957	0748	1857
12	0605	2101	0541	2131	0553	2130	0629	2052	0709	1955	0749	1855
13	0604	2102	0540	2132	0554	2129	0630	2051	0710	1953	0751	1853
14	0602	2103	0540	2132	0555	2128	0632	2049	0711	1951	0752	1851
15	0601	2104	0540	2132	0556	2128	0633	2047	0713	1949	0754	1849
16	0559	2106	0541	2133	0556	2127	0634	2046	0714	1947	0755	1848
17	0558	2107	0541	2133	0557	2126	0635	2044	0716	1944	0756	1846
18	0558	2108	0541	2134	0558	2125	0637	2042	0716	1943	0757	1844
19	0557	2109	0541	2134	0559	2124	0638	2040	0719	1940	0800	1842
20	0556	2110	0541	2134	0601	2123	0639	2039	0720	1938	0801	1840
21	0554	2112	0541	2134	0603	2122	0640	2037	0721	1936	0802	1839
22	0553	2113	0541	2135	0604	2121	0642	2035	0722	1934	0803	1837
23	0552	2114	0541	2135	0605	2120	0643	2033	0724	1932	0805	1835
24	0551	2115	0542	2135	0605	2119	0644	2032	0725	1930	0807	1833
25	0550	2116	0542	2135	0606	2118	0645	2030	0726	1928	0807	1832
26	0549	2117	0542	2135	0607	2117	0647	2028	0729	1926	0810	1830
27	0548	2118	0542	2135	0609	2115	0648	2026	0729	1924	0811	1828
28	0548	2119	0543	2135	0610	2114	0649	2024	0731	1922	0812	1827
29	0547	2120	0544	2135	0611	2113	0651	2022	0732	1920	0814	1825
30	0546	2121	0544	2135	0612	2112	0653	2020	0734	1918	0815	1824
31	0546	2122			0614	2110	0654	2018			0817	1822

Note: Above chart is prepared by U.S. Weather Bureau, Missoula, Montana, based on Mountain Daylight Saving Time and sunrise and sunset at Missoula. Planes can take off 1 hour before sunrise. Planes should be over target area not later than sunset for dropping and jumping. Subtract one hour for Mountain Standard Time.

PART 7 - APPENDIX (Con.)

PART 7 - APPENDIX (Con.)

RI-6310-21

FIRE CAMP ORDER AND INVENTORY SHEET
(Reference FSH 5132.51, 602.1)

Forest		Ranger District		Order No.	
Name of fire			Camp		
Location of camp or dropspot			In charge		
Date of order		Time		Date to be delivered	
Ordered by		Delivered by		Date	
Item number	Description	Unit	Ordered	Inventoried	
A-1	Initial camp - truck delivery. Specify for number of men	Each			
A-2	Initial camp - air drop. Specify for number of men	Each			
A-3	25-man standard outfit	Each			
A-4	25-man supplemental outfit	Each			
C-1	Lunch bag	Each			
C-2	Sleeping bag, paper	Each			
C-3	Sleeping bag, kapok	Each			
C-4	Air mattress	Each			
C-5	Tent	Each			
C-6	Plastic sheet	Roll			
C-7	Mess box	Each			
C-8	25-man disposable kitchen and mess outfit	Each			
C-9	1-day disposable mess outfit for 25 men	Each			
C-10	1-meal disposable mess outfit for 25 men	Each			
C-11	10-man disposable kitchen and mess outfit	Each			
C-12	Hot food container	Each			
C-13	Hot drink container	Each			
C-14	Steam kettle	Each			
C-15	Camp stove, propane	Each			
C-16	Stove and fly bundle	Each			

PART 7 - APPENDIX (Con.)

Item number	Description	Unit	Ordered	Inventoried
C-17	Propane	Each		
C-18	Fire irons	Each		
C-19	Meat slicer	Each		
C-20	Timerecorder and fire boss desk	Each		
C-21	Camp officer accessory box	Each		
C-22	Lister bag	Each		
C-23	Gasoline box	Each		
C-24	Carborundum grinder	Each		
C-25	Tool grinding outfit, portable	Each		
C-26	Commissary box	Each		
C-27	Generator, heavy duty	Each		
C-28	Generator, semiportable	Each		
C-29	Propane light	Each		
C-30	Mobile refer unit	Each		
C-31	Frozen breakfast, specify menus	Each		
C-32	Frozen lunch	Each		
C-33	Frozen dinner, specify menus	Each		
C-34	Accessory package for frozen meals	Each		
C-35	Coffee package	Each		
C-36	Rations, 30-man 1-day	Each		
C-37	Rations, smokechaser	Case		
C-38	Drinking water	Gallon		
C-39	Container, water, disposable	Each		
C-40	Timerecorder's kit	Each		
C-41	Recommended standard menus, specify menu number and number of men	Each		
C-42	Lunches, specify number of men	Each		

PART 7 - APPENDIX (Con.)

Item number	Description	Unit	Ordered	Inventoried
F-1	Pulaski toolbox	Each		
F-2	Shovel sack	Each		
F-3	Ax box	Each		
F-4	Ax bundle	Each		
F-5	Hand spray pump	Each		
F-6	Water bag	Each		
F-7	Water bag	Each		
F-8	Canteen, package	Each		
F-9	Headlights	Each		
F-10	Battery, carton	Each		
F-11	Headlight carton	Each		
F-12	Torch box	Each		
F-13	Safety hat package	Each		
F-14	Smokechaser's pack	Each		
F-15	Chain saw	Each		
F-16	Headlight and tool box	Each		
F-17	Pump unit, type Y	Each		
F-18	Pump unit, lightweight, type 5A	Each		
F-19	Pump unit, lightweight, Gorman-Rupp	Each		
F-20	Pump, high volume, low pressure	Each		
F-21	Slip-on tanker unit	Each		
F-22	Wcp-up kit, 6-man	Each		
F-23	Hose adapter	Each		
F-24	Garden hose	Each		
F-25	Hose, linen, 1"	Bundle		
F-26	Hose, linen, 1-1/2"	Bundle		
F-27	Gravity sock	Each		

PART 7 - APPENDIX (Con.)

Item number	Description	Unit	Ordered	Inventoried
F-28	Tank, water	Each		
F-29	Relay tank	Each		
F-30	Dozer light kit	Each		
F-31	Dozer skid pan	Each		
F-32	Fusees	Each		
*F-33	Cargo retrieving kit	Each		
F-34	Crosscut saw package	Each		
F-35	Plastic flagging	Roll		
M-1	Oxygen kit	Each		
M-2	First-aid kit	Each		
M-3	First-aid kit	Each		
M-4	First-aid kit	Each		
M-5	Snake bite kit	Each		
M-6	Bee sting medicine	Each		
M-7	Rescue facilities available	Unit		
M-8	Stokes litter	Each		
M-9	Belt weather kit	Each		
M-10	Fire danger station, portable	Each		
M-11	Weather unit, mobile (U.S. Weather Bureau)	Each		
M-12	Weather unit, portable (U.S. Weather Bureau)	Each		
M-13	Fire shelter	Each		
M-14	CO ² fire extinguisher	Each		
M-15	Rope	Foot		
M-16	Barrel pump	Each		
M-17	Jeep can	Each		
M-18	Knapsack	Each		
M-19	Saddle, pack, decker	Each		

PART 7 - APPENDIX (Con.)

Item number	Description	Unit	Ordered	Inventoried
M-20	Saddle, riding	Each		
M-21	Pack cover, manta	Each		
M-22	Thermofax	Each		
M-23	Cargo net, with swivel	Each		
M-24	Swivel	Each		
M-25	Base heliport kit	Each		
M-26	Sling bucket, helicopter	Each		
*R-1	Radio unit 1--sector fire camp, high band #1	Each		
*R-2	Radio unit 1--sector fire camp, high band #2	Each		
*R-3	Radio unit 1--sector fire camp, low band	Each		
*R-4	Radio communication unit, base camp, high band band #1	Each		
*R-5	Radio communication unit, base camp, high band #2	Each		
*R-6	Radio communication unit, base camp, low band	Each		
*R-7	Radio unit sector, high band #1	Each		
*R-8	Radio unit sector, high band #2	Each		
*R-9	Radio unit sector, low band	Each		
*R-10	Radio unit remote control	Each		
*R-11	Radio unit repeater	Each		
*R-12	AM base camp unit	Each		
*R-13	Extra radio, specify	Each		
*R-14	Radio SPF	Each		
*R-15	Radio batteries	Sets		
*R-16	Emergency wire	Each		
*R-17	Telephone unit	Each		
*R-18	Wire dispenser, helicopter	Each		
*R-19	Megaphone	Each		

*Items available only from Missoula.

PART VIII - APPENDIX

Sample Forms:

R1-5180-2	Special Fire Report for Class C, D, and E Fires ("2000 Report")
R1-5120-16	Fire-Weather Special Forecast Request
6500-58	Crew Time Report
R1-5130-11	Tool and Lunch Requisition
6500-76	Shift or Daily Record of Rental Equipment Use
CA-1	Employee's Notice of Injury or Occupational Disease
R1-6130-2	Detail Rating Form
R1-6320-17	Equipment Condition Report - Pickups, Trucks, Sedans, Jeeps and Similar Vehicles
R1-6320-18	Equipment Condition Report - Tractor and/or Motor Patrol
R1-6320-19	Equipment Condition Report - Powersaws

SPECIAL FIRE REPORT FOR CLASS C, D, AND E FIRES (References FSM 5181, FSH 5132.51, 901)				Date		
				Report time		
Instructions: Due in the Division of Fire Control each day before 2000 report until fire is controlled. For Class C fires, report only items with asterisk (*).						
*A. Fire name		*B. Forest		*C. Date started		
D. What fire threatens (critical watershed, improvements, high value timber stand, recreation areas, etc.)						
*E. Cause (specify)						
*F. Location (burned)	Township	Range	Sections			
*G. Prominent landmark (town, major peak, major drainage, wilderness, etc.)						
H. Forest type burned (spruce, brush, subalpine, etc.)						
*I. Acres burned (total)	National Forest		Other			
	Inside protection boundary		Outside protection boundary			
J. Cost of firefighting to date, this fire			K. Estimated total suppression cost through mopup			
*L. Expected control time and date			Controlled (time and date)			
M. Weather conditions at fire during last peak burning period		Wind	Temperature	Humidity		
N. Outlook forecast						
*O. Special features (fatalities, serious injuries, control problems, other protection agencies involved, loss of improvements, etc.)						
*P. Number of firefighters employed						
*Q. Number of major equipment used	Dozers	Pumpers	Ground tankers	Air tankers	Helicopters	Other
*R. Length of held line (chains)			*S. Length of line to build (chains)			
*T. Additional manpower planned						
*U. Additional equipment planned						

FIRE-WEATHER SPECIAL FORECAST REQUEST
(Reference FSM 5124.2, 5135.23. See reverse for instructions)

A. REQUESTING AGENCY WILL FURNISH:

1. Name of fire or other project		2. Control agency		3. Request made: Planned time of broadcast burn:		Time*	Date
4. Location (1/4 sec., sec., T., R.)		5. Drainage name		6. Exposure (NE, E, SE, etc.)			
7. Size of project (acres)**		8. Elevation** Top Bottom		9. Fuel type		10. Project on Ground Crowning	
11. Weather conditions at project or from nearby stations (see example on reverse):							

Place	Elevation	Observation time*	Wind direction, velocity	Temperature		Leave blank ***		Remarks (indicate rain, thunderstorms, etc.; also wind condition and tenths of cloud coverage)
				Dry	Wet	RH	DP	

12. Send forecast to:	Place	Via	Attention (name, if applicable)
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B. FIRE-WEATHER FORECASTER WILL FURNISH:

Forecast and outlook:	Time and date
Name of fire-weather forecaster	Fire-weather office

C. REQUESTING AGENCY WILL COMPLETE UPON RECEIPT OF FORECAST:

Forecast received:	Time	Date	Name
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*Use 24-hour clock to indicate time. Examples: 10:15 p.m. = 2215; 10:15 a.m. = 1015.
 **For concentrations (as groups of lightning fires), specify "Concentration"; then give number of fires and size of largest. If concentrations are in more than one drainage, request special forecast for each drainage.
 ***No entry necessary. To be computed by the fire-weather forecaster.

ALL RELAY POINTS should use this form to insure completeness of data and completeness of the forecast. A supply of forms should be kept by each dispatcher and all others who may be relaying requests for forecasts or who may be relaying the forecasts.

Observe the following instructions:

Fire Control and Other Project Personnel

1. Complete all items in section A each time a forecast is desired.

a. Example of weather conditions:

PLACE	ELE- VATION	OBSER- VATION TIME	WIND DIRECTION RELATIVE	WIND SPEED	MOON PHASE	BLANK	REMARKS (INDICATE RAIN, THUNDER- STORMS, ETC.) ALSO WIND CONDITION AND TERMS OF CLOUD COVERAGE
FIRE CAMP	2,750	125	NW	16			SCATTERED CLOUDS, 2/10 CUMULUS. THUNDERSTORMS ENDED 2 HOURS AGO. WIND GUSTY, DIRECTION VARIES FROM NW TO N.

b. Include preceding afternoon's weather data in addition to current data when requests are submitted for prescribed forecast hours.

2. Transmit data in numerical sequence by radio or telephone to the fire-weather office via Forest Service radio or commercial telephone. Telephone number of the Missoula fire-weather office is (Area Code 406) 543-7931. (The fire-weather forecaster will complete the special forecast as quickly as possible and transmit the forecast and outlook by the method requested.)

3. Upon receipt of special forecast, complete sections B and C.

4. Retain completed copy of form for your records.

5. Should conditions occur that are not correctly forecast, notify the fire-weather forecaster by telephone or radio.

Fire-Weather Forecasters

1. Copy information received on this form.

2. Complete special forecast as quickly as possible and return forecast and outlook by the method requested.

3. Supply pertinent radar scope information whenever possible, indicating time of radar report.

4. Complete "RH" and/or "DP" values in 15 min.

5. Retain copy for record purposes.

TOOL AND LUNCH REQUISITION
(Reference FSH 5132.51, 502)

Crew name and sector number

Ordered by (signature)

TOOL REQUISITION

Delivery instructions (check one):

Delivery location

Date needed

 Deliver \longrightarrow
 Crew will pick up

Time (military) needed

Number issued or requisitioned	Item	Size, weight, etc. (where applicable)	Number checked in
	Axes, double-bit		
	Axes, single-bit, sawyer		
	Cans, backpack, with pump		
	Canteens or waterbags (size)		
	Files		
	Fusees		
	Gasoline, powersaw		
	Hats, hard		
	Headlights		
	Kits, first aid (small or crew)		
	Oil, powersaw, cans		
	Packsacks		
	Fulaski tools		
	Saws, power		
	Shovels		
	Sledges (size--pounds)		
	Torches, backfiring		
	Wedges (wooden or steel)		
	Whetstones		

Tool manager (check-in verification signature)

LUNCH REQUISITION

Delivery instructions (check one):

Delivery location

Date needed

 Deliver \longrightarrow
 Crew will pick up

Time (military) needed

Number requisitioned	Type of lunch	Packaging (check one)	
		Individual cloth sacks	Packsacks
	Single lunches	Individual sacks	Packsacks
	Double lunches	Individual sacks	Packsacks

RECEIPT

Material/equipment received by (signature)

USDA-FOREST SERVICE

SHIFT OR DAILY RECORD OF RENTAL EQUIPMENT USE

Original to Equipment Time Recorder
Copy to Vendor or Representative
Copy to remain in book

NAME OF VENDOR/OWNER

NAME OF OPERATOR

IDENTIFICATION OF EQUIPMENT →

MAKE

TYPE

NUMBER (License or other)

NAME OF PROJECT OR FIRE	SHIFT TIME OR METER READINGS			OPERATING (Hours or Miles)	ORDERED OVERTIME (Hours or Miles)	OTHER (Identify) (Hours or Miles)
	DATE	START	STOP			

REMARKS (Show release, breakdown, or transfer time, unit to which transferred, etc.)

FOR THE VENDOR (Signature)

FOR THE FOREST SERVICE (Signature)

POSTED TO MASTER TIME RECORD

DATE

INITIALS OF RECORDER

6500-76

NOTE: The responsible Forest Officer will complete this form each day or shift for each piece of rented equipment under his supervision.

U. S. DEPARTMENT OF LABOR
Bureau of Employees' Compensation

EMPLOYEE'S NOTICE OF INJURY OR OCCUPATIONAL DISEASE
(Under the Federal Employees' Compensation Act)

INSTRUCTIONS

This form should be completed by the injured employee or someone on his behalf whenever an injury is sustained in the performance of duty and given to his immediate superior within 48 hours. It should be placed in the employee's official personnel file unless the injury causes disability for work beyond the day when it occurred; is likely to result in prolonged treatment or permanent disability; or in a charge for medical or related expenses when it should be forwarded to this Bureau with Form CA-2, Official Superior's Report of Injury. This form is also completed whenever an employee believes he suffers from a disease related to his employment. (See Sections 1.2, 1.3, 2.2 and 2.3 of the Bureau's Regulations.)

The immediate superior should also complete the reverse side of this form.

1. NAME OF INJURED EMPLOYEE (<i>Last, first, middle</i>)	2. DATE OF THIS NOTICE (<i>Mo., day, yr.</i>)
3. PLACE OF EMPLOYMENT (<i>Name and location of office or establishment</i>)	4. DATE OF INJURY (<i>Mo., day, yr.</i>)
5. OCCUPATION	6. HOUR OF INJURY (<i>a.m. or p.m.</i>)
7. PLACE OR LOCATION WHERE INJURY OCCURRED	
8. CAUSE OF INJURY (<i>Describe how and why injury occurred</i>)	
9. NATURE OF INJURY (<i>Name part of body affected—fractured left leg, bruised right thumb, etc.</i>)	
10. NAMES OF WITNESSES TO INJURY	
11. IF THIS NOTICE WAS NOT GIVEN WITHIN 48 HOURS AFTER THE INJURY, EXPLAIN REASON FOR DELAY. IF EARLIER NOTICE WAS GIVEN, VERBAL OR WRITTEN, STATE WHEN AND TO WHOM.	
I certify that the injury described above was sustained in the performance of my duties as an employee of the U.S. Government and that it was not caused by my willful misconduct, intention to bring about the injury or death of myself, or another, nor by my intoxication. I hereby make claim for compensation and medical treatment to which I may be entitled by reason of this injury.	12. SIGNATURE
	13. HOME ADDRESS OF INJURED EMPLOYEE

STATEMENTS OF THE IMMEDIATE SUPERIOR AND WITNESSES TO THE INJURY

The immediate superior should submit a statement and secure statements of witnesses where possible. The statements should tell just what each personally knows about the injury, and how and when such knowledge was obtained.

14. DATE CA-1 RECEIVED BY AGENCY (Mo., day, yr.)

15. CA-1 RECEIVED BY WHOM

16. STATEMENT OF IMMEDIATE SUPERIOR

17. SIGNATURE OF IMMEDIATE SUPERIOR

18. DATE (Mo., day, yr.)

19. STATEMENT OF WITNESS

20. SIGNATURE OF WITNESS

21. DATE (Mo., day, yr.)

22. STATEMENT OF WITNESS

23. SIGNATURE OF WITNESS

24. DATE (Mo., day, yr.)

DETAIL RATING FORM (References FSM 5134.1 and 6130.05f)		Detailed to:	
		Location or unit	
Name		Activity (If fire, indicate name and size class)	
Home Region	Home Forest or unit	Date: From _____ to _____	

Job assignment	From (date)	To (date)	Performance rating

Rating standards:

- | | |
|--|--|
| O - Outstanding | U - Unsatisfactory (each unsatisfactory rating must be supported by a brief statement of reasons) |
| VG - Very good (performance above average) | (N) - Needs training (indicate with an (N) following the performance rating if assignment is beyond his capability and experience) |
| G - Good (performance average) | |
| F - Fair (performance below average) | |

Remarks

Rating discussed:

Rating officer's signature and title (If fire, indicate fire assignment)	Detailer's signature
	Date rating discussed

For interregional fire training details: Send three copies to home Region for the Division of Personnel Management, Supervisor's Office, and Ranger District.

**EQUIPMENT CONDITION REPORT--PICKUPS, TRUCKS
SEDANS, JEEPS, AND SIMILAR VEHICLES**
(Reference FSH 5132.51, 403.1)
(Prepare form in triplicate)

Forest	Fire	Date: Initial inspection _____ Release inspection _____	
Make	Owner		
Model, size, etc.	Vendor (if other than owner)		
Serial or other number	Rental agreement date		
	Adequate		Remarks
Items	Yes	No	(continue on reverse if necessary)
Mileage			
Steering assembly			
Clutch pedal clearance			
Brakes, foot and hand			
Gages, all			
Horn			
Rearview mirror and wipers			
Seats and cushions			
Cooling system			
Engine			
Belts, fan, and generator			
Oil level and condition			
Leaks: Cooling system			
Engine oil			
Exhaust system			
Fuel system			
Brake system			
Gear boxes			
Electrical system			
Battery			
Transmission			
Drive line - U-joints			
Differential			
4-wheel drive			
Springs and shocks			
Tie rod			
Frame			
Lubrication			
Tires			
Spare tire			
Tire tools and jack			
Lights, all			
Glass (complete reverse)			
Body condition (complete reverse)			
Fire extinguisher			
Shovel, ax, and bucket			
Special accessories (list)			
Road test			
Vendor or owner			Inspector
Title			Title

The following items for glass and body condition must be inspected when making initial and final inspection of contract rental vehicles.

Items	Adequate		Remarks (continue below if necessary)
	Yes	No	
Right front fender			
Right door or doors			
Right rear fender			
Right side glass			
Right side - other*			
Rear glass			
Rear bumper			
Rear - other*			
Left rear fender			
Left door or doors			
Left front fender			
Left side glass			
Left side - other*			
Windshield			
Hood			
Grill			
Cab			
Front bumper			
Front - other*			

*Explain exact location and amount of damage in Remarks column.

Additional remarks (This block may also be used to attach pictures taken at time of initial inspection.)

EQUIPMENT CONDITION REPORT--TRACTOR

AND/OR MOTOR PATROL

(Reference FSH 5132.51, 403.1)

(Prepare form in triplicate)

Forest	Fire	Date: Initial inspection _____	
		Release inspection _____	
Make		Owner	
Model		Vendor (if other than owner)	
Serial or other number		Rental agreement date	
Items	Adequate		Remarks (Continue on reverse if necessary.)
	Yes	No	
Canopy or cab			
Belly plate and radiator guard			
Lights mounted and working			
Cables and hydraulic system			
Blade hoist brake holding			
Master clutch			
Steering clutches			
Brakes			
Gages working			
Fuel system			
Cooling system			
Fan and fan belts			
Battery			
Engine supports, equalizer bar, springs			
Muffler and spark arrester			
Engine			
Final drive			
Tracks and rollers			
Dozer and cutting edges			
Proper lubrication			
Tires			
Ax			
Shovel			
100-foot, 3/4-inch cable			
20-foot, 7/8-inch choker			
Extra cable			
Cable cutter			
Cable block, 3/4-inch size			
Crank			
First-aid kit			
Grease gun, bucket type			
Fire extinguisher			
Operating test			
Vendor or owner		Inspector	
Title		Title	