CHAPTER 2

INDIVIDUAL CLOTHING AND EQUIPMENT

Section 1. GENERAL

2-1. Basis of Issue

a. As used in this manual, individual clothing and equipment are those items issued or sold to a soldier for his personal use, and include certain organizational equipment utilized by the individual. The basis of issue of cold weather clothing and equipment may be found in TA 50-901. Mandatory items of personal clothing are listed in AR 700–8400–1.

b. The U.S. Army, through continuous research and development, endeavors to maintain the best clothing and equipment in the world. When properly fitted and properly utilized this clothing will provide adequate protection from the elements and will enable trained, well disciplined troops to carry out year-round field operations under cold weather conditions, wherever they may be encountered.

c. To utilize fully the protection afforded by the present standard cold weather clothing and equipment, it is necessary to understand the principle involved and the correct function of each item. This chapter covers basic principles and provides general guidance on the purpose and use of cold weather clothing and equipment.

2-2. Commander's Responsibilities

a. Many factors will influence the commander's decision as to what items of clothing and equipment his troops should wear or carry. These include the weather, mission at hand, actual duties to be performed, overall physical condition of individuals and their degree of proficiency. If a movement is involved he must consider the distance to be traveled, the method of travel, and how the troops will be fed en route, if applicable. If the movement is on foot, he must bear in mind that under nor-

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mal winter conditions, 65 to 70 pounds is the maximum weight a man can normally wear and carry and still be effective on reaching his destination.

b. The weight of individual clothing and equipment is covered in appendix E. Commanders should give particular attention to additional organizational equipment required for a given operation. Some of the more common items are also listed in appendix E. Since the individual soldier's combat load in cold weather operations exceeds that of a temperate climate load by more than 20 pounds, these organizational items (such as binoculars, compasses, radios and batteries, pioneer tools, crew served weapons, etc.) become major considerations and must be included at all levels of planning.

c. In addition to the individual combat load, another 45 to 55 pounds of clothing and equipment is required for the protection and comfort of each individual under conditions of *extreme cold*. Transportation must be provided for this additional load whenever possible.

d. The commander must take positive action to insure that a balance exists between what the individual is wearing and what he is required to carry in the way of equipment. He must also insure that troops dress as lightly as possible consistent with the weather in order to reduce the danger of excessive perspiring and subsequent chilling. The complete cold-wet or cold-dry uniform for the applicable environmental conditions must be readily available. A large proportion. of cold weather casualties results from too few clothes being available to individuals when a severe change in the weather occurs. Because of the differences in individual metabolism, commanders must not be arbitrary in delineating strict uniform requirements, but must allow some personal choice of undergarments.

2-3. Cold Weather Conditions

The use of cold weather clothing is affected by two types of weather conditions: wet and dry. These conditions are amplified by humidity coupled with temperature and wind velocity; high humidity (wet conditions), low humidity (dry conditions).

a. Wet Conditions. Cold-wet conditions occur when temperatures are near freezing and variations in day and night temperatures cause alternate freezing and thawing. This freezing and thawing is often accompanied by rain and wet snow, causing the ground to become muddy and slushy. During these periods troops should wear clothing which consists of a water-repellent, wind-resistant outer layer and inner layers with sufficient insulation to provide ample protection in moderately cold weather (above 14°F.).

b. Dry Conditions. Cold-dry conditions occur when average temperatures are lower than 14°F. The ground is usually frozen and snow is usually dry, in the form of fine crystals. Strong winds cause low temperatures to seem colder and increase the need for protection of the entire body (windchill) (fig. F-1). During these periods, troops should have available additional insulating layers of clothing. This is particularly true when entering static situations form a period of strenuous exercise.

Section II. CLOTHING

2-4. Purpose of Clothing

a. Protection of Body Against Climatic Factors.

- (1) If the body is to operate efficiently, it must maintain a normal temperature. The body attempts to adjust itself to the variable external conditions it encounters. These attempts are evidenced by the need for more food to produce additional heat during colder weather, by perspiration to increase removal of heat during hot weather, and by the gradual darkening of the skin as protection against extended exposure to the rays of the sun.
- (2) Proper clothing, correctly worn, will assist the body in its adjustment to extreme climatic conditions. The clothing does this by holding in the body heat, thereby insulating the body against the cold outside air. The problem of protection becomes acute when freezing temperatures are involved. To understand this problem requires a knowledge of the methods by which the body resists the effects of climatic changes.

b. Balancing Heat Production and Heat Loss. The body loses heat at variable rates. This heat may flow from the body at a rate equal to or greater than the rate at which it is produced.

When heat loss exceeds heat production, the body uses up the heat stored in its tissues, causing a rapid drop in body temperature. Excessive heat loss can result in shivering. Shivering uses body energy to produce heat which at least partially offsets the heat loss and slows the rate at which the body temperature will drop. Shivering is an important warning to start action to rewarm, either by adding more clothing, by exercising, by eating some food, or by entering a warm shelter, or by any combination of these actions. In freezing temperatures it is as important to remove and adjust clothing to prevent excessive overheating as it is to add clothing to prevent heat loss.

2-5. Principles of Clothing Design

Certain principles are involved in the design of adequate cold weather clothing to control the loss of heat from the body, to facilitate proper ventilation, and to protect the body.

a. Insulation. Any material that resists the transmittance of heat is known as an insulating material. Dry air is an excellent insulator. Woolen cloth contains thousands of tiny pockets within its fibers. These air pockets trap the air warmed by the body and hold it close to the skin. The principle of trapping air within the fibers or layers of clothing provides the most efficient method of insulating the body against

heat loss. Fur provides warmth in the same way; warm, still air is trapped in the hair and is kept close to the body.

- b. Layer Principle.
 - (1) Several layers of medium-weight clothing provide more warmth than one heavy garment, even if the single heavy garment is as thick as the combined layers. The effect results from the several thick layers of air which are trapped between the layers of clothing, rather than one or two layers of large volume. These layers, as well as the minute air pockets within the fibers, are warmed by the body heat.
 - (2) The layers of clothing are of different design. The winter underwear is most porous and has many air pockets. These air pockets trap and hold the air warmed by the body. To keep the cold outside air from reaching the still inside air that has been warmed by the body, the outer garments are made of windproof, water-repellent fabric.
 - (3) The layer principle allows maximum freedom of action and permits rapid adjustment of clothing through a wide range of temperatures and activities. The addition or removal of layers of clothing allows the body to maintain proper body heat balance.

c. Ventilation. Perspiration fills the airspaces of the clothing with moisture laden air and reduces their insulating qualities. As perspiration evaporates, it cools the body just as water evaporating from a wet canteen cover cools the water in the canteen. To combat these effects, cold weather clothing is designed so that the neck, waist, hip, sleeve, and ankle fastenings can be opened or closed to provide ventilation. To control the amount of circulation, the body should be regarded as a house and the openings in the clothing as windows of the house. Cool air enters next to the body through the openings in the clothing just as cool air comes into a house when the windows are open. If the windows are opened at opposite ends of a room, cross-draft ventilation results. In the same way, if clothing is opened at the waist and neck, there is a circulation of fresh air. If this gives too much ventilation, only the neck of the garment should be opened to allow warm air to escape without permitting complete circulation.

2-6. Winter Use of Clothing

a. Basic Principles of Keeping Warm.

- (1) Keep clothing Clean.
- (2)Avoid Overheating.
- (3)Wear Clothing Loose and in layers.
- (4) Keep clothing Dry
- (5) Remember C-O-L-D to keep warm in winter.

b. Application of Basic Principles.

(1)Keep clothing clean. This is always true from a standpoint of sanitation and comfort: in winter, in addition to these considerations, it is necessary for maximum warmth. If clothes are matted with dirt and grease, much of their insulation property is destroyed; the air pockets in the clothes are crushed or filled up and the heat can escape from the body more readily. Underwear requires the closest attention because it will become soiled sooner. If available, light cotton underwear may be worn beneath winter underwear to absorb body oils and lengthen the time interval between necessary washings of these more difficult to clean and dry garments. Winter underwear (Army issue is a 50/50 cotton/wool blend) and cushion sole socks (Army issue socks are 50 percent wool, 30 percent nylon, 20 percent cotton) should be washed in lukewarm water, if available. Hot water should not be used because it is injurious to the wool fibers and causes shrinkage. Synthetic detergents are more soluble than soap in cool water and also prevent hard-water scum, and are therefore recommended, if available. When outer clothing gets dirty it should be washed with soap and water. All the soap or detergent must be rinsed out of the clothes, since any left in the clothing will lessen the water-shedding quality of the clothing. In addition to destroying much of the normal insulation, grease will make the clothing more flammable. All outer garments of the Cold Weather Clothing System are washable and have laundry instruction labels attached. If washing is not possible for clothing that would normally be washed with soap and water, dry rubbing and airing will rid them of some dirt and accumulated body oils.

- (2) Avoid overheating. In cold climates, overheating should be avoided whenever possible. Overheating causes perspiration which in turn, causes clothing to become damp. This dampness will lessen the insulating quality of the clothing. In addition, as the perspiration evaporates it will cool the body even more. When indoors, a minimum of clothing should be worn and the shelter should not be overheated. Outdoors, if the temperature rises suddenly or if hard work is being performed, clothing should be adjusted accordingly. This can be done by ventilating (by partially opening parka or jacket) or by removing an inner layer of clothing, or by removing heavy mittens or by throwing back parka hood or changing to lighter head cover. The head and hands, being richly supplied with blood, act as efficient heat dissipators when overheated. In cold temperature it is better to be slightly chilly than to be excessively warm. This promotes maximum effectiveness of the body heat production processes.
- (3) Wear clothing loose and in layers. Clothing and footgear that are too tight restrict blood circulation and invite cold injury. Wearing of more socks than is correct for the type of footgear being worn might cause the boot to fit too tightly. Similarly, a field jacket which fits snugly over a wool shirt would be too tight when a liner is also worn under the jacket. If the outer garment fits tightly, putting additional layers under it will restrict circulation. Additionally, tight garments lessen the volume of

trapped air layers and thereby reduce the insulation and ventilation available.

- (4) *Keep clothing dry*.
 - (a) Under winter conditions, moisture will soak into clothing from two directions-inside and outside. Dry snow and frost that collect on the uniform will be melted by the heat radiated by the body.
 - (b) Outer clothing is water-repellent and will shed most of the water collected from melting snow and frost. The surest way to keep dry, however, is to prevent snow from collecting. Before entering heated shelters, snow should be brushed or shaken from uniforms; it should not be rubbed off, because this will work it into the fabric.
 - (c) In spite of all precautions, there will be times when getting wet cannot be prevented and the drying of clothing may become a major problem. On the march, damp mittens and socks may be hung on the pack. Occasionally in freezing temperatures, wind and sun will help dry this clothing. Damp socks or mittens may be placed, unfolded near the body, where the body heat will dry them. In bivouac, damp clothing may be hung inside the tent near the top, using drying lines or improvised drying racks. It may even by necessary to dry each item, piece by piece, by holding before an open fire. Clothing and footwear should not be dried to near a heat source. Leather articles, especially boots, must be dried slowly. If boots cannot be dried by any other method, it is recommended that they be placed between the sleeping bag and liner. Heat from the body will aid in drying the leather.

2-7. Components of Cold Weather Uniforms

The items of clothing below are Standard A as listed in SB 700-20. It should be borne in mind however that procurement may or may not have been started on some of the items

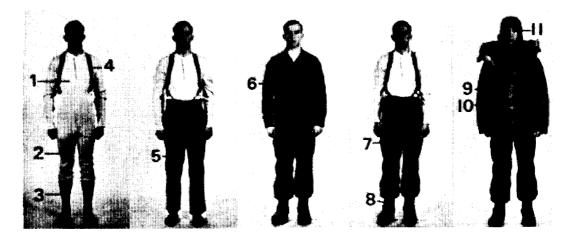


Figure 2–1. Basic components of cold-wet uniform.

and upon requisitioning some Standard B clothing may be issued. Although not shown as basic items of the cold weather uniforms, light cotton underwear may be worn under the winter underwear (para 2-6 b (1)).

a. Cold-Wet Uniform. The basic components of the cold-wet uniform are illustrated in figure 2-1 unless otherwise indicated.

- (1) Undershirt Mans. 50 Cotton 50 Wool, Full Sleeve.
- (2) Drawers Mens. 50 Cotton 50 Wool, Ankle Length.
- (3) Socks Mens. Wool Cushion Sole, OG 408, Stretch Type.
- (4) Suspenders Trousers. Scissors Back Type.
- (5) Trousers Mens. Wool Serge, OG 108.
- (6) Shirt Mans. Wool Nylon Flannel, OG 108.
- (7) Trousers Mens. Cotton Nylon, Wind Resistant Sateen, 8.5 oz, OG 107.
- (8) Boot Insulated Cold Weather. Mens Rubber Black (or Boot Combat: Mens Leather Black 8¹/₂" high with Overshoe: Rubber Man's High Cleated 5 Buckle).
- (9) *Coat Man.* Cotton and Nylon Wind Resistant Sateen, 8.5 oz, OG 107, with integral hood.
- (10) *Liner Coat Mens.* Nylon Quilted 6.2 oz, OG 106.
- (11) Cap *Insulating*, *Helmet Liner-Helmet*. Cotton Nylon Oxford, OG 107.

- (12) Glove Shells. Leather Black with Glove Inserts; Wool and Nylon Knit, OG 208, or Mitten Shells; Trigger Finger Leather Palm and Thumb with Mitten Inserts; Wool and Nylon Knit, OG, Trigger Finger, or Mitten Set Arctic; Gauntlet Style Shell with Leather Palm (fig. 2-5).
- (13) Hood Winter. Cotton and Nylon Oxford, OG 107, with drawcord and fur.
- (14) Poncho. Coated Nylon Twill, OG 207 (not illustrated).

b. Cold-Dry Uniform. The basic components of the cold-dry uniform are illustrated in figure 2-2 unless otherwise indicated.

- (1) Undershirt Mens. 50 Cotton 50 Wool, Full Sleeve.
- (2) Drawers Mens. 50 Cotton 50 Wool, Ankle Length.
- (3) Socks Mens. Wool Cushion Sole, OG 408, Stretch Type.
- (4) Suspenders Trousers. Scissors Back Type.
- (5) *Shirt Mans.* Wool Nylon Flannel, OG 108.
- (6) *Trousers Mens.* Cotton Nylon, Wind Resistant Sateen, 8.5 oz, OG 107.
- (7) *Liner Trousers*. Nylon Quilted, 6.2 oz, OG 106.
- (8) *Boot Insulated Cold Weather*. Mens Rubber White, w/release valve.
- (9) *Coat Man.* Cotton and Nylon Wind Resistant Sateen, 8.5 oz, OG 107.

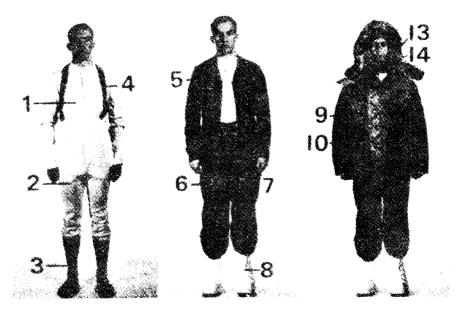


Figure 2-2. Basic components of cold-dry uniform.

- (10) Liner Coat Mans. Nylon Quilted, 6.2 oz, OG 106.
- (11) Parka Mans. Cotton and Nylon Oxford OG 107, w/o hood (not illustrated),
- (12) Liner Parka Mans. Nylon Quilted, 6.2 oz, OG 106 (not illustrated).
- (13) Cap, Insulating, Helmet Liner. Cotton Nylon Oxford, OG 107.
- (14) Hood Winter. Cotton and Nylon Oxford, OG 107, w/drawcord and fur.
- (15) Glove Shells. Leather Black with Glove Inserts; Wool and Nylon Knit, OG 108, or, Mitten Shells; Trigger Finger Leather Palm and Thumb with Mitten Inserts; Wool and Nylon Knit, OG, Trigger Finger, or, Mitten Set Arctic; Gauntlet Style Shell with Leather Palm (fig. 2-5).
- (16) Poncho. Coated Nylon Twill, OG 207 (not illustrated).
- (17) Gloves Cloth. Work Type (not illustrated).

2-8. Description and Wearing of the Uniform Components

- a. Cold-Wet.
 - (1) Inner layer.
 - (a) Underwear. The underwear is loose fitting and is made of 50 percent cotton and 50 percent wool. It is

constructed so that circulation and ventilation are not restricted.

- (b) Suspenders. The scissors-type suspenders are worn over the undershirt. The drawers and all succeeding layers of trousers are supported by the suspenders. The use of suspenders allows the drawers and trousers to be worn loose at the waist so that neither circulation nor ventilation is restricted.
- (2) Intermediate layer. The intermediate layer consists of the wool OG shirt and trousers which provide excellent insulation against the cold. The shirt is worn outside the trousers for better control of ventilation. The wool trousers and shirt are not designed to be worn as outer garments under field conditions since they lose their insulating qualities if they become wet or matted with dirt. When engaged in strenuous activity, care must be taken so that the wool material will not come in contact with the skin, thus causing possible irritation and discomfort.
- (3) Outer layer.
 - (a) Coat. The coat ensemble is made up of a shell and a detachable liner.



Figure 2-3. Cap insulating helmet and helmet liner.

The coat has a combination slide, snap and touch-and-close fastener front closure. The sleeves have adjustable cuffs with a hand shield extension. A lightweight hood is an integral part of the coat. When not being used the hood is secured under the collar and is concealed by a slide fastened enclosure. The detachable liner is made of quilted nylon and is extremely light and warm. The liner has a collar, open underarms, and buttonhole tabs for attachment to the coat.

- (b) *Trousers*. The trousers are made of smooth, light, wind resistant sateen. They have extra closures and adjustments. to provide for ventilation and better fit.
- (4) *Headgear*.
 - (a) Cap. The insulating helmet liner cap (fig. 2-3) is close fitting, visorless, and of helmet style. It has a combined one-piece earlap and neck protector, and utilizes an overlap touch-and-close fastener. The cap is designed to be worn under the steel helmet or under the winter hood. When worn as an outer headpiece, the lower flap portion of the cap may be folded up

around the top with the touch-andclose fasteners crisscrossed in the front (fig. 2-3).

- (b) Hoods. The winter hood (fig. 2-4) is a one-piece covering for the head, face, and neck. It utilizes touch-and-close fasteners and can be worn over the steel helmet. A malleable wire inside the fur ruff may be shaped as desired for visibility or greater protection of the head and face. Unit commanders must enforce "hood discipline," especially while men are on sentry duty or on patrols. The winter hood and the cold weather cap with flaps down will greatly reduce a man's hearing capabilities. When the temperature or wind does not require the use of heavier headgear, the cold weather cap and the lightweight hood should be worn. Hoods should be removed before the head starts to perspire. Breathing into the winter hood causes moisture and frost to accumulate and should be avoided as much as possible. Accumulated frost should be removed frequently.
- (5) Handwear. See c below.
- (6) Footwear. See d below.



Figure 2-4. Winter hood.

- b. Cold-Dry.
 - (1) Inner Layer. Same as cold-wet.
 - (2) Intermediate Layer. The wool OG shirt is worn as the basic upper body garment. The wind resistant sateen trousers with the quilted nylon liner are worn as the basic lower body garment. In extreme cold weather, the



1 Wool insert 2 Leather shell Figure 2-5. Types of gloves and mittens.



Mitten insert Mitten shell 5 Trigger finger Adjustable wrist strap 6 Cord loop

Trigger finger loop

Figure 2-5-Continued.



Snap fastener Cord loop Mitten insert Mitten shell Adjustable gauntlet strap

> coat with detachable liner, used as an outer layer in the cold-wet uniform, may be worn as an intermediate layer in cold-dry conditions.

(8) *Outer Layer*. Depending on tempera-ture the outer garment may consist of the coat with detachable liner, the parka, with detachable liner, or both,

The parka is a three-quarter length, unlined coat with adjustable cuffs. It has a combination slide and snap fastener front fly closure, waist and hem drawcords and a split lower back. The parka has a detachable quilted nylon liner.

- (4) Headgear. Same as cold-wet.
- (5) Handwear. See c below.
- (6) Footwear. See d below.
- c. Handwear.
- (1) *Gloves*.
 - (a) Standard black leather gloves are worn in mild weather or when work must be done that requires more freedom of finger movement than can be acquired with heavier handwear. In colder weather the same gloves are worn with wool inserts (fig. 2-5). Gloves may be worn with either the cold-wet or cold-dry uniforms when the weather is not cold enough to require the use of mittens.
 - (b) Personnel engaged in delicate finger operations, such as instrument adjustment may be issued lightweight cotton work gloves. These gloves allow for finger dexterity, have leather palms, and prevent the skin from sticking to cold metal. They will provide protection against cold for only a very short period.
- (2) *Mittens*.
 - (a) The trigger finger mitten shells (fig. 2-5), are worn with wool trigger finger inserts during periods of moderate cold. The mittens may be worn with either the cold-wet or cold-dry uniform. Figure 2-5 shows the Standard B mitten. The Standard A item, although identical in outward appearance has had the trigger finger loop deleted and is lined on the inside upper surface with lightweight quilted nylon.
 - (*b*) During periods of extreme cold the arctic mitten set is worn (fig. 2-5). The mitten has a liner, a leather palm, a cheek warmer and a fast-

ener on the back. A neck strap is attached to both mittens to prevent loss. The neck strap permits the mittens, when not required for warmth, to be conveniently carried snapped together behind the back. The arctic mitten set is carried whenever there is the possibility of the onset of severe cold weather, regardless of the mildness of the weather when setting out.

- (3) Utilization.
 - (a) The general rules concerning the use of clothing apply also to hand-wear—keep it clean, avoid over-heating, wear loose in layers, and keep it dry.
 - (b) The outer shells should always be worn with the minimum insulation necessary to provide protection, thus avoiding perspiration. Inserts should never be worn by themselves because they wear out quickly and provide little warmth alone. Trigger finger inserts are designed to fit either hand. Changing them to opposite hands frequently will insure even wear.
 - (c) Tight fitting sleeves should be avoided. They may cut down circulation and cause hands to become cold.
 - (d) When handling cold metals, the hands should be covered to prevent cold burns (immediate freezing of the flesh in contact with cold soaked metals).
 - (e) To keep hands warm when wearing mittens, the fingers should be curled (inside the mittens) against the palm of the hand, thumb underneath the fingers, or flexed inside the mitten whenever possible to increase the blood circulation. Hands may be exercised by swinging the arms in a vertical circle. Frostbitten hands can be warmed by placing them next to the skin under the armpits.
 - (f) An extra pair of mitten inserts should be carried.

d. Footwear.

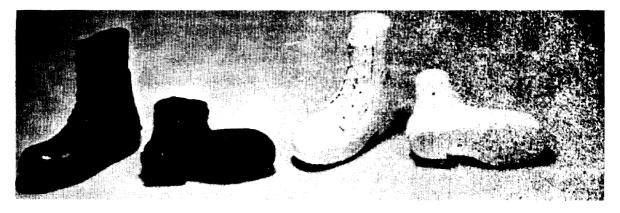
- (1) *General.* The feet are more vulnerable to cold than are other parts of the body. Cold attacks feet most often because they get wet easily (both externally and from perspiration) and because circulation is easily restricted. Footgear is therefore one of the most important parts of cold weather clothing.
- (2) Principles.
 - (a) The rule of wearing clothing loose and in layers also applies to footgear. The layers are made up by the boot itself and by the socks. Socks are worn in graduated sizes. The instructions pertaining to fitting of footgear, as outlined in TM 10-228, must be carefully adhered to. If blood circulation is restricted, the feet will be cold. Socks, worn too tightly, might easily mean freezing of the feet. For the same reason: AVOID LACING FOOTGEAR TIGHTLY.
 - (b) Since the feet perspire more readily than any other part of the body, the rules about avoiding overheating and keeping dry are difficult to follow. Footgear is subjected to becoming wet more often than are other items of equipment. The insulated boots with release valve (white, cold-dry and black, coldwet) are designed to contain perspiration within the interior of the boots. A change of dry socks should be carried at all times. Whenever the feet get wet, dry as soon as possible and put on a pair of dry socks. Also, the inside of the boots should be wiped as dry as possible.
 - (c) Footgear should be kept clean. Socks should be changed when they become dirty. Socks and feet should be washed frequently. This washing will help keep feet and socks in good condition.
 - (d) The feet should be exercised. Stamping the feet, double-timings few steps back and forth, and flexing and wiggling toes inside the

boots all require muscular action, produces heat, and will help keep the feet warm. The feet should be massaged when changing the socks.

(e) Boots are designed to permit attachment to individual oversnow equipment (skis and snowshoes). BINDINGS MUST BE AD-JUSTED CAREFULLY. If they are too tight, the circulation of blood is restricted and feet will get cold. Improperly adjusted bindings may soon chafe feet or badly wear and tear the boot.

(3) *Types*.

insulated, cold weather: (a) Boot, mens, rubber, black. These boots (1, fig. 2-6) are particularly useful in snow, slush, mud, and water (cold-wet conditions), but are not adequate for prolonged wear in temperatures below -20° F. They are specifically designed for combat personnel who may not have the opportunity to frequently change to dry socks. Insulating material is hermetically sealed into the sides and bottoms of the boots. The insulation takes the place of removable innersoles and the secondary layer of socks worn in other types of cold weather boots. Perspiration from the feet and water spilling over the tops of the boots cannot reach the insulating material because it is sealed-in and always remains dry. Moisture from outside sources or from perspiration may make the socks damp; this dampness is not harmful to the feet, provided they receive proper care such as frequent drying and massaging. If socks are not changed and feet dried regularly (at least twice daily) the skin becomes softened and is more readily chaffed or blistered. These effects are occasionally mistaken for superficial frostbite. Only one pair of cushion-sole socks are worn with



1. Boot, insulated, black

2. Boot, insulated, white, w/release valve

Figure 2-6. Types of boots.

the boots. Additional socks should not be worn as the feet may become cramped, resulting in restricted blood circulation and cold feet.

(**b**) Boot. insulated. weather: cold mens, rubber, white, w/release *valve.* The insulated white boot (2, fig. 2-6) is designed for wear in cold-dry conditions and will protect the feet in temperatures as low as -60° F. The boots have a seamless inner and outer carcass, sealed insulation, and an outside air release valve used to compensate for air differentials. The white boots are worn over one pair of cushion sole socks. The air release valve provides airborne troops a means of equalizing external and internal air pressures when undergoing extreme changes in altitude. This valve must remain closed at all other times to prevent the possibility of introducing any amount of moisture into the insulation of the boot and rendering it permanently unserviceable.

2-9. Nose and Cheek Protectors and Masks

a. The Mask, Cold Weather may be issued

for use during severe windchill conditions. The mask *must* be removed at intervals to check for frostbite.

b. A certain amount of protection can be gained by covering as much of the face as possible with a wool scarf. It may be adjusted from time to time, and should be rotated when the section opposite the mouth and nose becomes covered with frost. The frozen end should be left outside the coat or parka. The scarf, like the mask, *must* be removed at intervals to check for frostbite.

2-10. Camouflage Clothing

a. Winter camouflage clothing (overwhites) consists of white trousers and lightweight parka with hood. White covers are also issued for the rucksacks.

b. Camouflage clothing provides a means of concealment and camouflage from the enemy —both from the ground and from the airin winter conditions. Use of the white camouflage clothing is, however, dependent on the background; generally speaking, on vegetation and the amount of snow on the ground. The complete white suit (fig. 6-26) is worn when terrain is covered with snow. Mixed clothing (fig. 6-27)—white parka and dark trousers, or vice versa—is used against mottled back

grounds. The correct use of camouflage clothing is extremely important (para 6-22).

c. Overwhites may become frosty and icy after use. As with all clothing, the frost and ice must be removed to expedite drying. Soiled camouflage clothing will lose its effectiveness; therefore, care must be exercised when handling stoves, digging in ground, and performing similar tasks. Avoid scorching or burning the garments when drying or when lying down by an open fire. The clothing should be washed or changed frequently. When changing, clothing should be checked to insure that it fits over the basic garments without restricting movement.

2-11. Maintenance of Clothing and Equipment

a. Footgear.

(1) Boots. The leather in boots should be treated with approved agents. Normally, the insulated boot can be repaired with ordinary tire patching or air mattress patching material. If these items are not readily available, friction tape or even chewing gum may be used temporarily to plug up the hole and prevent moisture from damaging the insulation. If the damage cannot be repaired, the boots should be removed, airdried, and

SECTION III. EQUIPMENT

2-12. Sleeping Equipment

a. The complete sleeping bag for use in cold climates consists of three parts: a case, of water-repellent material; an inner bag (mountain type), of quilted tubular construction, filled with a mixture of down and feathers; and an outer bag (arctic bag), of the same material as the inner bag. In addition, an insulating air mattress and a waterproof bag into which the sleeping bags are packed are issued.

b. When temperatures are normally above 14° F., only one bag is used. It is placed in and laced to the cover. When temperatures are below 14° F., both bags are used. The inner bag is placed inside the outer bag and secured at turned in for replacement as soon as possible. The inside of the boots should be washed at least once a month with a mild soap, and rinsed with warm water.

Caution: Do not clean with abrasive materials. Also do not apply polish or paint to any part of the boot as it will result in deterioration of the rubber.

(2) Socks. Socks should be washed daily, using lukewarm water to avoid excessive shrinkage. After washing, they should be wrung out and stretched to natural shape before drying. Holes in socks should be repaired as soon as possible, taking special precautions to avoid bunching or roughness of the mended area. It should be noted that proper repairs under field conditions are almost impossible and that blisters should be expected if field mended socks are worn.

b. Handgear. Holes should be mended promptly. Gloves or mittens should not be dried too near an open fire.

c. Headgear. Headgear should be washed as required to remove perspiration, dirt, and hair oils. When drying, normal care must be exercised to avoid scorching or burning.

the foot with the loops and tie straps provided and the cover laced over the outer bag.

c. When the bag is used, it is first fluffed up so that the down and feather insulation is evenly distributed in channels, thus preventing matting. Since cold penetrates from below, and the insulation inherent in the bag is compressed by the weight of the body, additional insulation is placed under the bag whenever possible. Added insulation can be obtained by placing ponchos, extra clothing, backboards, fiber ammunition or food containers, or boughs between the sleeping bag and the ground. The insertion of a waterproof cover, such as a poncho, between the sleeping bag and air mattress will prevent the mattress and bag from freezing together at very cold

temperatures. This is caused by condensation on the mattress due to the difference in temperatures between the lower side touching the ground and the upper side touching the relatively warm sleeping bag. Care must be taken to prevent puncturing the mattress or damaging sleeping bags. In general, the more insulation between the sleeping bag and the ground, the warmer the body.

d. If the tactical situation permits, individuals should avoid wearing too many clothes in the sleeping bag. When too many clothes are worn they tend to bunch up, especially at the shoulders, thereby restricting circulation and inducing cold. Too many clothes also increase the bulk and place tension upon the bag, thus decreasing the size of the insulating airspaces between layers and reducing the efficiency of the insulation. In addition, too many clothes may cause the soldier to perspire and result in excessive moisture accumulating in the bag, a condition which will likewise reduce the bag's insulating qualities.

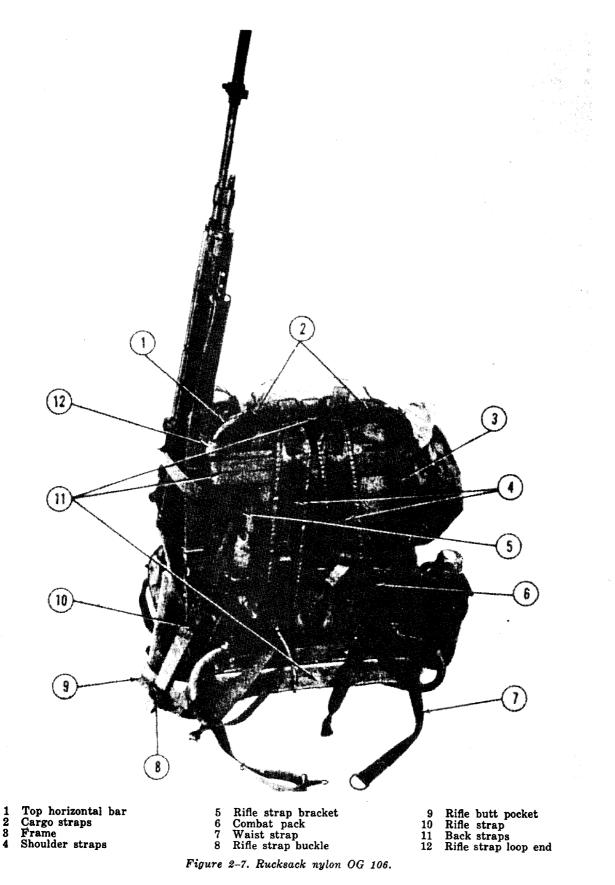
e. The sleeping bag is equipped with a full length slide fastener which has a free running, nonlocking slider. In an emergency, the bag can be opened quickly by grasping both sides of the opening near the top of the slide fastener and pulling the fastener apart. As a safety precaution, bags should be tested at frequent intervals to insure that the slide fastener operates freely and will function properly.

f. The sleeping bag should be kept clean and dry. It should be opened wide and ventilated after use to dry out the moisture that accumulates from the body. Whenever possible, it should be sunned or aired in the open. The bag always should be laced in its waterrepellent case and carried in the waterproof bag to prevent snow from getting on it. The warmth of the body could melt the snow during the night and cause extreme discomfort. Individuals should avoid breathing into the bag. If the face becomes too cold it should be covered with an item of clothing. Sleeping bags should be drycleaned at least twice a year. As a safety precaution, bags should be thoroughly aired prior to use to prevent possible asphyxiation from entrapped drycleaning solvent fumes.

2-13. Manpack Equipment

- a. Rucksack-Nylon, OG 106 (fig. 2-7).
 - (1) The nylon rucksack consists of the following:
 - (a) A lightweight aluminum alloy frame to which all other components are attached.
 - (b) A lightweight aluminum alloy cargo support shelf provided as optional equipment for attachment to the frame when the frame is used as a packboard.
 - (c) A pouch fabricated from 4-ounce nylon fabric.
 - (d) Nylon left and right shoulder straps. The left shoulder strap has a quick-release device designed to facilitate rapid doffing of the rucksack. The right shoulder strap has a rapid adjustment buckle for lengthening the strap which allows the wearer to fire his rifle while in the prone position. The two straps are interchangeable to accommodate left-handed soldiers.
 - (e) A nylon webbing waist belt designed to prevent the rucksack from swinging to either side or bouncing during body movements.
 - (f) A rifle carrier consisting of a rifle butt pocket, constructed of nylon webbing, with a double hook and a rifle strap.
 - (2) The nylon rucksack is the normal pack equipment used for operations in northern areas and replaces the rucksack, with frame (Standard C). It should be noted that this item may be issued in lieu of the nylon rucksack. It should also be noted that the plywood packboard may be issued in lieu of the nylon rucksack. The soldier using the rucksack can carry extra clothing and rations in the nylon pouch and can also carry one sleeping bag (in waterproof bag). When the nylon pouch is removed and cargo support shelf attached, the rucksack may be used as a packboard for carrying loads weighing approximately 50 pounds (TC 10-8).

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b. Suspenders and Belt, Individual Equipment. The suspenders and belt of the M-56 standard load-carrying equipment is worn beneath the nylon rucksack to carry ammunition pouches, first aid or compass case, and the entrenching tool. The suspenders and belt should be adjusted to fit loosely over the cold weather clothing, to allow for proper ventilation. The suspender belt combination is designed so that the belt can be worn unbuckled while on the march, if additional ventilation is required.

2-14. Miscellaneous Equipment

a. Sunglasses, Sunglasses always should be worn on bright days when the ground is covered with snow. They are designed to protect the eyes against sunglare and blowing snow. If not used, snow blindness may result. They should be used when the sun is shining through fog or clouds, A bright, cloudy day is deceptive and can be as dangerous to the eyes as a day of brilliant sunshine. The sunglasses should be worn to shade the eyes from the rays of the sun that are reflected by the snow. Snow blindness is similar to sunburn, in that a deep burn may be received before discomfort is felt. To prevent snow blindness, sunglasses must be used from the start of exposure. Waiting for the appearance of discomfort is too late. The risk of snow blindness is increased at high mountain altitudes because the clear air allows more of the burning rays of sunlight to penetrate the atmosphere. When not being used, they should be carried in the



Figure 2-8. Improvised sunglasses.

protective case to avoid scratching or breaking the lens. If sunglasses are lost or broken, a substitute can be improvised by cutting thin, 3 cm (l") long slits through a scrap of wood or cardboard approximately 15 cm (6") long and 3 cm (1") wide. The improvised sunglasses (fig. 2-8) can be held on the face with strips of cloth if a cord is not available.

- b. Canteens.
 - (1) Canteen, water; cold climatic (fig. 2-9), This canteen is a vacuum-insulated canteen of one quart capacity with an unpainted dull finish steel exterior. The inner and outer stainless steel vessels are welded together at the top of the neck. A nonmetallic mouthpiece at the neck prevents lips from freezing to the metal neck. A plastic cap seals and protects the mouthpiece. A nesting type metal cup with a capacity of one pint is provided for eating and drinking beverages. The canteen with cup is carried in a canvas cover which fastens to field equipment in a manner similar to the conventional canteens. Care must be taken to insure that the mouthpiece or cap are not lost. A sharp blow to the canteen may result in denting or rupture with consequent loss of insulating capabilities.
 - (2) *Conventional metal and plastic can*teens. Conventional canteens are carried in a fabric carrier; however, this will not keep the liquid in the canteen from freezing in extreme cold. When possible, the canteen should be carried in one of the pockets or wrapped in any woolen garment and packed in the rucksack. If available, warm or hot water should be placed in the canteen before starting an operation. During extreme cold the canteen should never be filled over two-thirds full. This will allow room for expansion if ice should form, and will prevent the canteen from rupturing. Insure that the gaskets are in the cap at all times. This is an important precaution and will prevent the liquid from leaking out and dampening the clothing in the ruck-

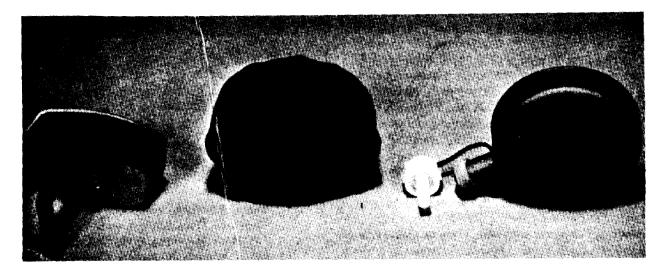


Figure 2-9. Canteen, water; cold climatic.

sack. Conventional thermos bottles will keep liquids hot, or at least unfrozen for approximately 24 hours, depending on temperatures. If canteens or thermos bottles freeze, they should be thawed out carefully to prevent bursting. The top should be opened and the contents allowed to melt slowly.

c. Pocket Equipment. There are several small items that should be carried in the pockets so they will be readily available for use. Having these items when they are needed will contribute to the well-being of individuals and help prevent injuries. A good sharp pocketknife is an essential item. It is useful for cutting branches, in shelter construction, in repairing ski bindings, and numerous other tasks. Waterproof matches should be carried and kept in the watertight matchbox and used only in an emergency. They should never be used when ordinary matches and lighters will function. Sunburn preventive cream will protect the skin from bright, direct sunshine, from sunrays reflected by the snow, and from strong winds. The chapstick will prevent lips from chapping or breaking due to cold weather or strong winds. The chapstick should be protected from freezing. The emergency thong has numerous uses, such as lashing packs, replacing broken bootlaces, and repairing ski and snowshoe bindings.

d. Emergency Kit. It is recommended that all personnel carry an emergency kit for use in individual survival. With this kit, an individual can survive off the land by trapping and fishing and can procure the minimum amount of food necessary to maintain his strength for a short period of time.

- (1) 1 each emergency thong.
- (2) 1 each sharp pocketknife.
- (3) Single-edge razor blades.
- (4) Waterproof matches.
- (5) Safety pins.
- (6) Fishing line.
- (7) Fire starters.
- (8) Salt tablets.
- (9) High protein candy bars.
- (10) Bouillon cubes.

2-15. Steel Helmet

The steel helmet may be worn during warm periods in cold areas in the same manner as in moderate climates. During cold periods it is normally worn over the Cap, Insulating Helmet Liner-Helmet. The helmet may also be worn under the winter hood.

2-16. Protective Mask

a. The Mask, Protective, Field, M17 is the Army standard protective mask. Information on this mask can be found in TM 3-4240-202-15. TM 3-4240-202-15, describes the winterization measures for the M17 Mask. In addition to the wearing of tinted antiglare

outserts for the plastic lenses, this kit provides for winterization inlet and nosecup valves together with an ice prefilter. This allows the standard mask to be worn at temperatures down to -50° F. with the M6A2 hood.

b. The protective mask may be worn in moderately cold weather in the same manner as in moderate climates. When the mask is used in extreme cold, the rubber facepiece should be warm enough to make it pliable when it is adjusted to the wearer's face. One method of keeping the mask warm is to carry it inside the outer garments and next to the body. It is also recommended that the mask be kept inside the sleeping bag during the night. On removing the mask, any moisture on the face should be wiped off immediately to prevent frostbite. After drying the face, the facepiece of the mask should be thoroughly dried to prevent freezing of moisture inside the mask. The rubber cover of the outlet valve should also be raised and the valve, surrounding area, and the inside of the cover wiped dry to prevent the outlet valve from icing.

c. If it becomes necessary to wear the mask for protection against chemical agents during extreme cold weather, troops must be advised

that the facepiece of the protective mask will not protect the face from the cold and that, in fact, the opposite is true. The danger of frostbite increases when the mask is worn.

d. The three automatic atropine injections of 2 mg each, carried as accessories during moderate temperature conditions, are carried in a pocket of the protective mask carrier. In cold weather (40° F. and below), the injectors will be removed from the carrier and placed in the inside of the right-hand pocket of the OG shirt, where body temperature will prevent freezing.

2-17. Body Armor

Standard issue body armor may be worn with either of the cold weather uniforms. When worn with the cold-wet uniform it is worn over the OG shirt and under the coat and liner. When worn with the cold-dry uniform it is worn over the OG shirt and under the coat and liner or the parka and liner. Although the body armor is worn primarily for protection against shell and mortar fragments, it may provide additional environmental protection for the user; however, because of the weight, armor should be worn only for its primary purpose and not for additional warmth.