Chapter 2

Clothing and Personal Equipment

2001. Cold Weather Clothing

a. Military cold weather clothing systems. Military cold weather clothing systems are designed to change with needs of the Marines. By varying the parts of the clothing system they are using, Marines can be comfortable when performing vigorous activities in the cold if proper "principles of wear" are adhered to. The basic principles for clothing worn can be remembered by using the acronym **C.O.L.D.**

(1) C- Keep clothing CLEAN. Clothing keeps you warm by trapping warm air against your body and in the pores of the clothing itself. If these pores become filled with dirt, sweat, or other grime, the clothing will not be able to do its job efficiently. Therefore, your clothes should be kept as clean as possible to keep you as warm as possible.

(2) O- Avoid OVERHEATING. Everyone naturally assumes that the more clothes you have on, the warmer you will be. This is true up to a point, and that point is when your body starts overheating and sweating. A Marine engaged in physical activity, such as digging a fighting position or snow shelter, will be warmer than one who is just standing guard. If both Marines are dressed the same, the one that is active will start to overheat. The key to surviving under this condition is not to be hot, but *comfortably cool*; not cold, but cool. If at any time you are sweating, you are too hot. Sweating is a sign that your body wants, and needs, to cool down. Let the environment cool you down, not sweat. This may be as simple as opening buttons or unzipping the underarms of the ECWC parka, instead of removing a whole layer of clothing. Once you stop your work, or feel yourself getting cold, bundle up again just enough to keep cool. Allowing just enough clothes and body activity to keep you cool, and the environment to cool you down, will keep your clothes from getting sweaty and dirty, and therefore improving their effectiveness. Overheating also contributes to several cold weather injuries such as dehydration, heat exhaustion, and hypothermia.

(3) L- Wear clothing LOOSE and LAYERED. Loose Clothing- Clothes should fit loosely for comfort. If clothing is too tight, it may act as a tourniquet, causing blood to pool in your extremities, (arms, legs, fingers, and toes.) This prevents blood from circulating into your body core and re-warming, thus causing that limb to get cold. Tight clothing will also prevent air from becoming trapped between your body and clothes. It is the warm air that keeps you warm, not the clothes. Layering- Compare this to your house, which has several layers, not just one, to keep you warm. It has shingles and a roof, a wood frame, siding, insulation, walls, foundation, and floor. A furnace heats the air inside the house to keep you warm. The layers are barriers holding this heated air around you. The first wall holds a warm cushion of air, perhaps allowing 25% of the warm air to escape. The second wall or insulation, however, will capture part of that, holding another warm layer of air, until only a fraction of warm air escapes to the outside. Even when a strong wind hits your house blowing away one layer of air, you still have several others. Your body works along the same principle, with your body being the furnace and your clothing layers being the walls. The more layers used, the more warm air will be trapped. Strangely enough, several thin layers working together will work better than one thick layer alone.

(4) D- Keep clothing DRY. Clothing must be kept dry from the outside, such as putting on rain gear during wet conditions, and from the inside, such as taking a layer off when you start to sweat. Once your clothes are wet, the water or sweat starts to evaporate, drawing warmth away from your body.

b. **Principles of Design.** The principles of the military cold weather clothing systems are: Vapor Transmission Layer, Insulating Layer, and the Protective Layer. They are best remembered by using the acronym V.I.P. Moisture accumulated in the undergarments will inhibit the cold weather clothing systems from functioning correctly. A good rule of thumb is to *start cool.* Then after ten to fifteen

minutes, make a rest stop, remove unnecessary layers and vent the neck, waist, and under the arms to avoid overheating.

(1) Vapor Transmission Layer: Better called a "sweat transfer layer," this layer soaks up your body moisture and draws it away from your body to keep it dry. Significant progress has been made with such synthetics as polypropylene, which draws water away from the body, and helps to keep the body dry.

(2) Insulating Layer: This is the layer that holds the warm air around your body. Preferably, it is made of polyester pile, but wool is adequate.

(3) Protective layer: This not only protects the insulating layer from getting dirty, but also from getting wet. It should be made of wind resistant/water repellent materials.

NOTE: These are the three main layers to consider in the military clothing system. There may be times when one or more layers are not used, or when the insulating layer may be several layers thick.

2002. ECWCS Clothing (NEW)

a. The Clothing Systems. There are three clothing systems currently in use in the Marine Corps: the new Extended Cold Weather Clothing System (ECWCS), the old M-1950 Cold Wet/Cold Dry seven layer system and the Specialty Clothing System developed to fit the specific needs of aviation and maintenance personnel (reference NAVAIR Manual 13-1-6.7 chapter 5.) This manual will only discuss the ECWS system since the old M-1950 seven-layer system is being phased out.

(1) Extended Cold Weather Clothing System (ECWCS). ECWCS was developed to provide a lighter weight, less bulky clothing system that was better suited for the modern cold weather battlefield. This system uses recently developed synthetic materials to provide warmth and handle moisture much better than the older standard clothing system. ECWCS is a layered insulating system adjustable to personal preference, metabolism, and prevailing weather conditions. It is designed to maintain adequate environmental protection between plus forty degrees Fahrenheit and negative twenty five degrees Fahrenheit, (four degrees Celsius and negative thirty one degrees Celsius). The Extreme Cold Weather Boots protect down to negative fifty degrees Fahrenheit, (negative forty-five degrees Celsius). This system uses the moisture management principle to pull perspiration away from the skin so that the user will remain warm and dry. In cold, wet, and arctic environments, it is recommended that Marines use only clothing items in the ECWCS. Marines should not combine ECWC garments with any items that are made with wool or wool blends, with the exception of the glove inserts and cold weather hood. It is easy to maintain in both field and garrison environments. The unique characteristics of this state of the art material require special use and care instructions that are followed. You can find these instructions on the items themselves.

(2) ECWCS Clothing Items

1. General. The Marine Corps has recently completed a new cold weather system.

2. **Long Underwear**. The cold weather system consists of the undershirt and drawers.

- Description of Undershirt. The polypropylene undershirt is a buff-colored turtleneck that has a center front zipper that extends to the middle of the chest area.
- Description of Drawers. The polypropylene drawers, also buff-colored, serve as a base layer to protects the lower extremities.
- Concept of Use. The underwear layer that is next to the skin acts as a vapor transmission or moisture wicking layer. This draws moisture away from the skin while transferring it to the outer layers of the clothing system. The wearing of issue cotton undergarments will negate the wicking action of the polypropylene. The cotton fibers will hold moisture next to the skin cotton equal death. DO NOT wear cotton undergarments when using this clothing.

3. **Cold Weather Fleece Shirt**. The cold weather fleece shirt is a new item. (Fleece Shirt/100% Polyester, 300 Weight)

- Description of Item. The shirt is black-colored, has reinforced shoulders, upper back, upper chest and elbow patches, a convertible turtleneck collar, front zipper, elastic shock-cord waist, Velcro fastened wrist straps, and two hand-warmer pockets with zippers.
- Concept of Use. The polyester fleece shirt serves as the primary insulating layer for the upper body.

4. **Cold Weather Fleece Bib Overall**. The cold weather fleece bib is a new item. (Fleece Bib/100%polyester, 300 Weight)

- Description of Item. The bib is black-colored, has adjustable elastic suspenders with quick release fastener buckles located in the front, front zipper, and full-length zippers at the outside seams.
- Concept of Use. The polyester fleece bib serves as the primary insulating layer for the lower body and legs. Recommended to be worn only when a Marine is stationary, i.e., standing sentry duty or in periods of intense cold.

5. **Trousers, Cold Weather, Field, (Nylon and Cotton).** The olive green or four-color camouflage printed cold weather field trousers, (Trousers, Cold Weather, Field, Nylon and Cotton), are standard items of cold weather issue and are also used in the ECWCS.

- Description of Item. Characteristics of the field trousers are the side-hanging pockets, hip pockets, cargo pockets, draw–cords at the trouser bottoms, and the adjustable waist straps.
- Concept of Use. The field trousers serve as a durable outer layer to be worn over the insulating layers when the outer extended cold weather trouser, (Gore-Tex), is not needed.

6. **ECWCS Parka Camouflaged**. (PARKA, extended Cold Weather, Camouflaged, Gore-Tex)

- Description of Item. The parka has an integral hood, (the new generation of parkas have a pocket in the collar for hood stowage), two inside breast pockets which can be accessible without unzipping the parka, two large cargo pockets, and a two-way front zipper to provide full face protection leaving only the eyes uncovered. There is an elastic draw cord at the hem, Velcro wrist tabs, underarm ventilation with zippers and a rank tab at center chest.
- Concept of Use. The parka serves as part of the windproof and water-resistant layer in the system. The polytetraflouroethylene (PTFE) laminate in the garment serves to repel water while allowing perspiration to be expelled.

7. **ECWCS Camouflage Trousers**. (Trousers, Extended Cold Weather, Camouflage, Gore-Tex)

- Description of Item. The trousers have seat and knee reinforcement patches, pass through pockets, and inserts in the seams of the leg openings to allow easy donning and removal without removing the boots.
- Concept of Use. The trousers serve as part of the windproof and waterproof layer in the system. The PTFE laminate in the garment has the property to repel water while allowing perspiration to be expelled.

8. **Snow Camouflage Parka and Trousers**. The snow camouflage parka and trousers (Parka, Snow Camouflage and Trousers) are standard carryover items from the M-1950 issue.

- Description of Item. The hooded white parka has drawstrings for adjustment at the waist draw cord, side pockets, a hip pocket, knee pleats and drawstrings at the ankles of the trousers. The parka and trousers, snow camouflage, are to be worn for whatever type of camouflage is required in snow covered terrain.
- Concept of Use. The over white parka trousers are used as a camouflage outer layer in snow covered terrain and is not a substitute for an outer garment. It is worn over the (ECWCS) parka and trousers.

9. **Hood C/W (Balaclava)**. The head wear in the ECWCS cold weather system.

•Description of Item. The hood consists of a wool, knitted cap, which covers the entire neck and face with holes for the eyes and nose and is a pullover ski mask style that comes in either green or black.
•Concept of Use. The cap is intended to provide protection in cold weather to the neck and face.

10. **Hand Wear**.
•General. The standard hand wear items are: Glove inserts, gloves, mitten inserts, mitten shells (cold weather and snow camouflage mitten set). These items are carryover items from the standard M-1950 cold weather issue. These items are considered part of the ECWCS issue. The gloves and glove inserts are unit supply items, while the mittens, mittens inserts and camouflage shells are Training Allowance Pool items.

2003. ECWCS Accessories (NEW)

a. The items in this section are considered part of the ECWCS issue. Some of these items are new to the Marine Corps while some are carry over items from the M-1950 issue.

(1) ECWCS Accessory Items

1. **Suspenders**. The suspenders (Suspenders, Trousers M-1950) are a carry over item used with the field trousers.
•Description of Item. The olive drab suspenders straps are scissor-back style (cross over in the back). The suspenders have two slide buckles and two hooks which attach to the trousers.
•Concept of Use. The suspenders are to be used with the trousers, extended cold weather, camouflage.

2. **Head-over Scarf**. The head-over scarf (Scarf, Head-over) is an item borrowed from NATO allies. This item enables Marines to regulate their body temperature.
•Description of Item. The head-over scarf is a circular knitted wool tube 2 feet long and 9 inches wide laid flat, open at both ends, with the face of the fabric lightly brushed.
•Concept of Use. The head-over scarf is to be wrapped around the neck, pulled over the head and ears, or pulled down over the neck and lower back.

2004. Care, Use, and Maintenance of ECWCS (NEW)

a. The individual Marine is responsible for keeping his ECWCS items in good serviceable condition. This is his uniform. It will not continue to effectively serve its intended purposes unless it is kept clean, maintained in good repair, and stored properly. The ECWCS will protect him only if he takes care of it and wears it properly. Check the label to see if the size is correct. This is extremely important in order to achieve maximum user satisfaction using the layering principle. ECWCS IS DIFFERENT. Pay particular attention to cleaning instruction for layers 1 and 4, polypropylene underwear and parka/trousers, extended cold weather, camouflage, as these items are made of state of the art materials and require added care.

b. **Donning and Doffing Procedures**. The ECWCS is an insulating system consisting of the following five primary layers (including the overwhites, when necessary) and accessories:

(1) Layer1-Polypropylene undershirt and drawers

(2) Layer2-Bib overall, cold weather shirt and trouser liner.

(3) Layer3-Coat liner and filed trousers.

(4) Layer4-Extended cold weather camouflage parka and trousers.

(5) Layer5-Snow camouflage parka and trousers (overwhite)

c. Layering. Layers 1 and 4 are always worn; add layers 2 and 3 as necessary to stay warm. The bib overalls in layer 2 are normally worn for temperatures below –25 F (-32C). Remove layers 2 and 3 as necessary to avoid overheating when on the move. The polypropylene underwear has the ability to draw moisture away from the skin and transfer it to the outer layers of the system. Beginning with layer 1, add layers 2 and 3 as the temperature drops. Layer 4 is the outer layer of the ECWCS when snow camouflage is not required. Layer 5 is the outer layer of the ECWCS when snow camouflage is required. Layer 5 is not a substitute outer garment, but is worn over layer 4 only as a camouflage. Adjust layers according to preference, metabolism, and weather conditions.

d. Inspection. Examine the ECWCS items regularly for tears, punctures, or damage to the material. Punctures of the outer layer will produce leaks and eventually ruin the material if not properly maintained. Repairs should be made as soon as possible.

e. Rank Insignia. Attach rank insignia on the parka to the rank tab, which is provided at the center of the chest. Either the pin-on or sewn-on rank insignia may be used. Be careful not to puncture or snag the outer layer of the material when attaching rank as punctures will produce leaks.

f. Cleaning. Clean ECWCS clothing items regularly when is use. Dirty clothes wear out quickly because dirt cuts textile fibers and retains moisture from perspiration. Prior to laundering and drying, make sure all the drawcords are tied together, all zippers are zipped and all snaps and hooks are fastened. Securing these items will result in a better laundered garment. When laundering, use delicate or gentle fabric wash cycle or by hand, using cold water (up to 85 F/29C) and cold water laundry detergent. Rinse in clean cold water. DO NOT USE BLEACH OR STARCH. Tumble dry at the lowest fabric cycle, delicate/gentle do not exceed 90F/32C. Remove immediately at the need of drying. AVOID OVER DRYING. To drip dry, remove water and place or a rustproof hanger. **DO NOT PRESS**.

g. Water Repellency. If the fourth layer (Parka/Trousers, Extended Cold Weather, Camouflage) of ECWCS leaks and inspection has revealed no rips or tears, wash garments in mild powdered detergent. Detergents used in cleaning affect water repellent qualities. DO NOT WASH GARMENTS IN LIQUID DETERGENT. When liquid detergents are used, they leave a chemical residue, which actually reduces the waterproof properties of the fabric. To restore the weather repellency of the parka/trousers, occasionally steam garments with an iron on steam setting being careful to hold the iron about ½ inch above the garment. **REMEMBER, DO NOT PRESS**.

2005. Footwear

USMC footwear consists of two types: the old Vapor Barrier system and the new ski march boot/sock system.

a. The Vapor Barrier (VB) boot system consists of three items: The cushion-sole wool socks, the black cold weather boot and the white extreme cold weather boot. The barrier (VB) boots use an inner and an outer boot made of rubber and filled with either wool fleece or closed cell foam (neoprene) insulation. The rubber acts to stop the movement of moisture from the feet. Heat is transferred quickly by the moisture in the air. By trapping the moisture, the boots trap heat. The boots also act to keep the moisture out. New Socks, Men's, Nylon, Cushion Sole Stretch type, OD-106 should be worn by Marines; also, carry dry socks and change socks at least 3 times a day when wearing VB boots. When possible, the VB boots should be removed for at least a few hours a day to allow the feet to breathe and dry out. There are two types of VB boots:

(1) Boots, Cold Weather (Type 1, Black). These boots are worn in the cold wet environment and will protect the feet down to –20F.

(2) Boots, Extreme Cold Weather (Type 2, White). These boots are worn in the cold dry environment and will protect the feet down to –50F.

b. Ski March Boot System. The system consists of several layers including vapor transmission socks, insulating socks, vapor barrier sacks, the boot itself, and several different overboot designs.

(1) Components of the Sock system: The sock system currently undergoing test in the Marine Corps is a three sock-layered system. The first layer is a lightweight single layer polypropylene sock. It should fit snugly. It is designed to wick moisture away from the foot and prevent blisters by reducing friction. The intermediate layer of the system is a vapor barrier sock. (This layer is only worn in extreme cold temperature. Working on the same principle as the Vapor Barrier (VB) boot it traps all of the heat created from the feet. The problem is that is also traps all of the moisture.) This sock should be worn between the vapor transmission and the insulating layers. This keeps the foot warm and protects the insulating layer from perspiration. Never wear the VB socks over the insulating socks, as it will cause the socks to become saturated and lose its heat retention properties. Remember the "D" in COLD. Also, be careful of using the VB sock when it is warm as it can cause blisters due to excessive sweating. The third layer is a hook stitch pile fiber made of 50% wool and 50% polypropylene. This combination provided the warmth needed for prolonged ski movements and still allows the moisture to pass through the sock. When looking at this sock you will see that there is a smooth side and a rough side. The smooth side is worn on the inside next to your foot.

(2) Use of the Sock System. Two pairs of the vapor transmission and insulating socks are issued. This enables the wearer to continually rotate the socks, allowing the other pair to be dried in whatever method is available. Body heat works well.

(3) Care of the Sock System. In the field, is important to keep the socks as dry and clean as possible to prevent them from losing their specific properties. Shake out your socks to keep them as free as possible from dirt and body oil which render them less effective. This is in keeping with the "C" in COLD. When in garrison, wash the polypropylene inner socks in the same manner as the polypropylene long underwear. The wool socks should be washed in cold water with mild detergent such as Woolite.

(4) Ski March Boot. The ski boot now undergoing final testing is the ALICO single ski boot. It has a box-toe and a grooved heel that is designed to work with our standard issue ski and the NATO 120 binding. The boot tongue is gusset in design and incorporates a collar with Thinsulate and Evapor insulation.

- **Felt Insoles -**The felt is designed to add insulation, absorb moisture that would otherwise be absorbed by the boot itself, and to form to the foot for a more comfortable fit. The boot is provided with two liners to allow a wear/dry rotation. Sleeping with one liner next to your body will both dry it and warm it prior to putting the boot on.
- **Sizing -**Proper sizing of the boot is critical. Done wrong, the Marine may suffer from blisters of frostbite. Sizing must be done with the felt liner in the boots and wearing all three socks of the previously discussed sock system. Normally, 1 to ½ sizes larger will be required for proper fit. The boot should fit snugly in the heel area to avoid blisters, but not so tight that it cuts off circulation. The toes should have some movement, but avoid side slippage which not only causes blisters but also reduces control while skiing.
- **Breaking In**. New boots must be broken in gradually. Wear for no more than four hours at a time for the first few days to prevent blisters as will as foot fatigue.
- **Waterproofing**. There are many commercially available products that effectively waterproof boots.

c. Care of the Ski March Boot. Caring for your ski march boot is much the same as any other leather boot. Dry your boot whenever possible, avoiding open flames or any method that will dry the boot too quickly. Strive to keep the boot dry to prevent freezing. Using foot powder to absorb excess moisture is okay as long as it is kept to minimum; otherwise, the fibrous parts of the boot can become clogged and reduce effectiveness.

d. **Gaiters**. Also known as "Super" gaiters, these are worn whenever the ski boots are. It is nylon Gore-Tex legging that is fully insulated. To place on the boot feed the toe of the boot through the front hole on the bottom of the gaiter. Slide the heel of the boot through the rear hole in the rubber seal is snug against the welt of the boot. If the rubber seal will not stay in place along the toe of the boot, a light coat of Purple Klister (ski wax) will help stick it in place.

e. **Overboots**. As their name implies, are worn over the entire ski march boot system. The overboots are fully insulated and have a hard sole for walking. They are not designed for skiing.

- **Care:** Caring for the Super gaiters and the Overboots are essentially the same. Keep as clean and dry as possible. Open the gaiter occasionally while wearing to allow condensation to evaporate. If the rubber parts start to dry out, coat them with a silicone spray.

2006. Specialty Uniforms

The Specialty Uniform System uses four cold weather clothing layers found in the supply system and is not stored or obtained from the Training Allowance Pool, (TAP).

2007. Cold Weather Personal Equipment

Cold Weather Personal Equipment is specially designed to provide protection and to be as lightweight as possible.

a. The sleeping system consists of a sleeping bag, an insulated sleeping mat, and a waterproof bag.

(1) There are two types of sleeping bags that, when used in conjunction with the camouflage Gore-Tex bivy-bag, will provide protection according to the following temperature scales:

- **Sleeping Bag, Type I, intermediate cold**, for temperatures down to +10F, uses polyester batting for insulation and weighs 7.5 lbs.

- **Sleeping Bag, Type II, extreme cold**, for temperatures down to –50f, uses waterfowl feathers, down, and polyester batting for insulation, weighs 9.5 lbs.

(2) Sleeping Mat. The sleeping mat replaced the old pneumatic mattress. It provides excellent insulation from ground cold and can be used for sitting, sentries, when consolidating following assaults, and in ambush positions when personnel must lie prone for long periods of time.

(3) Waterproofing Bag. This is used to protect the sleeping bag from getting wet. Sleeping bags are difficult to dry once wet and care should be taken to keep them as dry as possible.

b. **Load Bearing Equipment**. Marines are now issued the LCS-88 pack for use in cold weather/mountainous environments. This pack has an internal frame, fully adjustable suspension, a map flap, three external ski tunnel pockets, as internal divider for the zipper opened sleeping bag compartment, a radio pocket, numerous attachment points for ALICE equipment. Packing of this pack is discussed in Chapter 8, "Movement on Foot."