APPALACHIAN SEARCH AND RESCUE CONFERENCE, INC.

T R A I N I N G G U I D E

Third Edition

July 1983

Appalachian Search and Rescue Conference, Inc.
P.O. Box 440 Newcomb Station
Charlottesville, VA 22903

ASRC 24-hour alerting phone number: (804) 323-2300
(Virginia Office of Energy and Emergency Services)

C O N T E N T S

PRINTING HISTORY

Preliminary Draft Edition, May 1976

Second Draft Edition, January 1977

Third Draft Edition, July 1977

First Edition, September 1977
Editors: Yorke Brown, Keith Conover, and Tom Vines

Second Edition, April 1982; First Printing, August 1982
Editors: Keith Conover and E. Henry St. Clair, Jr.

Second Edition, with corrections and additions, September 1982

Third Edition, July 1983; First Printing, February 1984
Editors: Keith Conover and Bob Skinner

I. INTRODUCTION

The Bylaws of the ASRC provide for five kinds of membership, each of which carries certain privileges and responsibilities. The Bylaws set forth certain requirements for the conferring of each type of membership, for instance a favorable vote by the applicant's Group for Trainee status. For some types of membership, the Bylaws require applicants to meet standards of competence established by the ASRC Board of Directors or by the ASRC Membership. The purpose of this Training Guide is to set forth those standards of competence and to guide the Groups in providing appropriate training and testing for their members. Information on the administrative requirements for membership and on voting rights may be found in the Bylaws. Note that the standards set by the ASRC are minimums, and that Groups may establish additional standards for membership.

The five classes of ASRC membership are the following:

a. Certified Members have met rigorous and comprehensive standards of competence in field search and rescue techniques, and form the core membership of the ASRC. Members may be certified to one of two levels:
   1. Basic Members have achieved a professional level of competence that qualifies them to carry out routine mountain search and rescue tasks, including serving as Field Team Leader for a Field Team on a search.
   2. Rescue Members have achieved a level of competence, beyond the Basic level, that qualifies them for mountain rescue leadership and search management positions.

b. Trainee Members are those who have newly joined the ASRC and who are actively pursuing certification to Basic Membership.

c. Associate Members are those who are unable or unwilling to meet the standards for certification to Basic or Rescue, but nevertheless possess skills or knowledge useful to the ASRC or one of its Groups. By meeting certain requirements, an Associate may acquire the right to vote and hold office in his Group, and also may acquire the privilege of wearing the ASRC uniform.

d. Auxiliary Members have minimal training, but provide a pool of outdoor-experienced searchers who are not unfamiliar with search and rescue techniques as practiced by the ASRC.

e. Sustaining Members contribute monetary or other support to the ASRC or one of its Groups, but do not participate in the administrative or operational activities of the ASRC.

It must be stressed that (except in the case of Auxiliaries and Sustaining members) the classes of membership should not be construed as limitations on the kind of duties which may be assigned during a mission, but rather they serve as a guide to the minimum capabilities that may be confidently expected.

Although the authority to certify members to the various classes resides in the ASRC Board of Directors, the responsibility for training and testing lies with the individual Groups. For this reason, the Bylaws provide that each Group select one of its Certified members whose responsibility is to serve his Group as the executive agent of the ASRC Board in all membership matters. This person is called the Training Officer, and his selection is subject to the approval of the ASRC Board of Directors. The authority and responsibilities of the Training Officer are spelled out in detail in the ASRC Bylaws. Each applicant for a class of membership must be examined by the Training Officer and found to meet the standards contained in this Training Guide and the requirements of the Bylaws before the Training Officer may admit him to that class of membership.

Once certified, a member is expected to maintain his competence at or above the level to which he is certified. In order to insure continued competence, the Training Officer conducts an annual review* of each member's skills and knowledge, and may revoke his certification if they are insufficient. The Bylaws contain details of certification and decertification procedures.

In addition to maintaining his personal skills, each Basic and Rescue Member must have attended at least 32 hours of field training with the ASRC or one of its Groups during the year prior to his review. This must include 8 hours of search field training and 8 hours of Basic-level mountain rescue training.

---

* In order to reduce the work load of the Training Officer, it is permissible to review all of the members on the same date each year.

II. TRAINEE MEMBERSHIP

A. General

1. To become a Trainee Member of the ASRC, the applicant must:

   a. Make application to the appropriate Training Officer;
   b. Participate in training with the Group for at least three months, with satisfactory performance as judged by the Training Officer;
   c. Meet the technical standards of this Section, as determined by the Training Officer;
   d. Acquire all personal equipment necessary to participate safely and fully in missions and training exercises, as determined by the Training Officer;
   e. Be proposed for Trainee Membership by the Training Officer at a business meeting of the applicant's Group (or of the ASRC Board of Directors for at-large applicants); and
   f. Receive a favorable vote by the Group (or the ASRC Board) in accordance with procedures specified in the ASRC Bylaws.

2. Each Training Officer establishes and publishes a list of required equipment for Trainees.

3. Trainee Membership expires one year from the date of the applicant's acceptance, unless extended in accordance with procedures specified in the ASRC Bylaws.

B. Trainee Level Technical Standard: *Outdoor Experience*

The applicant must demonstrate experience in the outdoors, and in particular, competence in wilderness travel (e.g. backpacking or mountaineering), as judged by the Training Officer.

C. Trainee Level Technical Standards: *Search*

1. The applicant must have completed an ASRC Auxiliary Member Training Session, or have acquired similar training and experience, as judged by the Group Training Officer.

2. The applicant must pass a written examination on the ASRC Search and Rescue Operations Plan (SAROP) administered by the Group Training Officer.

D. Trainee Level Technical Standards: *Emergency Medicine*

1. The applicant must have a current American National Red Cross Standard First Aid and Personal Safety card, or demonstrate equivalent knowledge in a written test administered by the Group Training Officer.

2. The applicant must have a current American National Red Cross or American Heart Association CPR card.

III. BASIC MEMBERSHIP

A. General

1. To become a Basic Member, a Trainee must:

   a. Complete all procedures to become a Trainee Member (see Section II);
   b. Complete 32 hours of ASRC or Group field training as a Trainee, including 8 hours on search and 8 hours on Basic-level mountain rescue;
   c. Meet the technical standards of this Section, as determined by the Training Officer;
   d. Possess the personal equipment necessary to perform search tasks as a Field Team Leader in all seasons, as established and published by the Training Officer;
   e. Receive a favorable subjective evaluation by the Training Officer, regarding the Trainee's overall competence to perform the tasks expected of a Basic Member;
   f. Be proposed for Basic Membership, by the Training Officer, at a business meeting of the Trainee's Group; and
   g. In accordance with the procedures of the ASRC Bylaws, receive a favorable vote of the Group's Certified Members.

2. The Training Officer must establish with reasonable certainty that every Basic Member can, upon demand, perform any of the skills included in the Basic standards. Certification testing will assess all vital skills (e.g. belaying), and an appropriate selection of other required skills and knowledge; the details of certification testing is left to the Training Officer. The selective nature of any certification test, although necessary, requires the Training Officer to incorporate his subjective impressions and knowledge of the applicant into the grading of certification tests.

3. Basic Members must complete annual continuing education requirements, maintain skills proficiency, and pass an annual review as explained in Section I.

(Note: Portions noted by asterisks (*) and in *italics* are supplemental standards employed only by the Shenandoah Mountain Rescue Group, and are not part of the official ASRC Standards.)

B. Basic Level Technical Standards: *Survival and Wilderness Travel*

The candidate must be able to perform the tasks listed in the following items:

1. Convincingly explain the important psychological aspects of survival, including:
   a. the priorities of short-term survival: the will to live, air, shelter, water, and food;
   b. reactions to fear, pain, discomfort, and danger, and their effects on the mind and body;
   c. the usefulness and dangers of panic, and the use of the STOP mnemonic for preventing panic;
   d. evaluating and acknowledging the limits of oneself and others;
   e. the way artificial goals may interfere with rational judgement; and
   f. the concept of one's pack and equipment as a life support system.

2. Briefly describe the following physiological concepts pertinent to survival:
   a. homeostasis;
   b. energy level and exhaustion;
   c. fatigue;
   d. daily caloric (food) and water needs of the human body;
   e. the relative energy content and availability of fat, protein, starch, and sugar, including the effects of different levels of exertion and seasonal differences; and
   f. conditioning for search and rescue, including conditioning for strength, flexibility, and endurance.

3. Explain the "energy budget" concept of body temperature homeostasis, including the following key points:
   a. the routes of heat loss, and their relative importance:
      i. temperature (conduction and radiation),
      ii. windchill (convection), and
      iii. wetchill (conduction and evaporation);
   b. the use of energy stores to produce heat, and the metabolic costs of shivering;
   c. vasodilation, sweating, and behavior as means of increasing heat loss, and the long-term consequences of them;
   d. vasoconstriction and behavior as means of conserving heat;
   e. the effects of tobacco and alcohol on normal heat homeostasis; and
   f. the particular danger of "hypothermia weather," that is, temperatures near freezing with wind and rain.

4. Explain the major points of wilderness clothing selection, including:
   a. listing the "3 W's" of clothing priority for wet cold climates, and explaining their importance. They are:
      i. wind protection,
      ii. waterproof clothing, and
      iii. wool (or other warm-when-wet) clothing;
   b. the advantages, disadvantages, and appropriate uses of waterproof shell garments, and the water penetration resistance of urethane-coated nylon, "60/40 cloth", "65/35 cloth", and Gore-tex;
   c. cold-weather dressing concepts, including the layer principle, ventilation, "dressing cold", and the dangers associated with overheating in the winter; and
   d. description of clothing materials, including cotton, down, wool, and synthetic fibers, in terms of dry warmth, wet warmth, wind protection, absorption and retention of water, and wicking of water.

5. Distinguish equipment suitable for wilderness search and rescue, including boots, packs, sleeping bags and pads, and stoves.

6. List the basic characteristics (voltage, life, weight, cost, temperature characteristics, and dangers) of carbon-zinc, alkaline, lithium, and nickel-cadmium cells.

7. Briefly describe pertinent local weather patterns, including the signs of arriving cyclonic winter storms, cold fronts, warm fronts, and local storms.

** 7.5. Describe the dangers of lightning and proper actions when on an exposed ridge (or elsewhere) during a thunderstorm. **

8. Travel cross-country competently in a middle appalachian wilderness area during summer, spring, or fall, including:
   a. large stream crossings;
   b. fourth class rock climbing; and
   c. proper pace and rest stop use, and use of the rest step.

9. Bivouac overnight with normal mission pack gear in summer, spring, or fall, and carry out mission tasks for a full day following.

10. Build a functional emergency overnight shelter from local materials, and build a fire using mission pack gear.

11. Describe the means of transmission, preventive measures, and appropriate measures in suspected or possible exposure, if any, for the following diseases:
   a. Rocky Mountain Spotted Fever;
   b. Tetanus;
   c. Rabies;
   d. enteritis and diarrhea (viral, bacterial, or protozoal); and
   e. chiggers, ticks, and mites.

12. Briefly describe the causes, prevention, diagnosis, and wilderness treatment for the following:
   a. muscle cramps;
   b. friction blisters;
   c. tendinitis;
   d. localized infection, including ingrown nails and abscesses;
   e. contact dermatitis (e.g. poison ivy);
   f. poisonous bites and stings: pit viper bites, spider bites, and bee stings;
   g. allergic and anaphylactic reactions;
   h. animal and human bites;
   i. fever;
   j. snowblindness;
   k. hypothermia (acute, subacute, and chronic); and
   l. heat cramps, heat exhaustion, heatstroke, and dehydration.

13. Briefly describe how one should treat the following medical problems in a wilderness setting:
   a. subungual hematomas (blood under a fingernail after a crush injury);
   b. nosebleed;
   c. ear infection;
   d. conjunctivitis, a foreign body in the eye, and eye abrasions;
   e. burns and frostbite;
   f. minor and major soft tissue injuries;
   g. sprains, strains, and dislocations;
   h. closed fractures; including improvised splinting;
   i. open fractures;
   j. shock;
   k. gastroenteritis, diarrhea, and vomiting; and
   l. attached ticks and embedded chiggers.

14. Present important factors involved in the decision to:
   a. administer oral fluid and electrolyte replacement; and
   b. to wait for an evacuation team versus beginning an evacuation with improvised methods.

15. Properly use the following improvised evacuation methods:
   a. 2-person linked-arms "chair" carry;
   b. 2-person packstrap-and-pole carry;
   c. both split coil and sling "piggyback" carries; and
   d. improvised stretchers: rope stretcher, rope and pole stretcher, parka and pole stretcher, and blanket and pole stretcher.

X 10 BSONTARS.

C. Basic Level Technical Standards: *Land Navigation*

The candidate must be able to perform the tasks listed in the following items:

1. Given a standard 7.5 minute U.S. Geological Survey (USGS) topographic quadrangle map, correctly identify the following:
   a. grades of highways, roads, trails, and bridges;
   b. power and other landmark lines;
   c. buildings, schools, churches, and cemeteries;
   d. storage tanks, wells, mines, caves, picnic areas, and campsites;
   e. benchmarks (control stations) and spot elevations;
   f. boundaries and fence lines;
   g. contour lines, depressions, cuts, and fills;
   h. perennial and intermittent streams, falls, springs, and marshes;
   i. valleys, ridges, peaks, sags (saddles, cols); and
   j. elevations and general land contours.

** 1.5. Given a topographic 7.5 minute quadrangle map, or a copy of the edges of the map, interpret information printed on the map, including:*
   a. dates of field checking and photorevision;
   b. scales and contour intervals;
   c. magnetic and grid declination information;
   d. grid ticks for latitude/longitude, the Virginia Grid System, and the Universal Transverse Mercator (UTM) - Military Grid Reference System (MGRS); and
   *e. names of adjacent maps. **

2. Given a photocopy 7.5 minute series topographic map section with an ASRC grid overprint, the original 7.5 minute quadrangle map, and a Uniform Map System (UMS) gridded aeronautical chart of the area, identify points via:
   a. latitude and longitude;
   b. the ASRC grid system;
   c. the Uniform Map System; and
   d. an azimuth and distance off a VOR (an aeronautical radio-navigation beacon).
   ** e. the Military Grid Reference System. **

** 2.5. Distinguish the meanings of true north, magnetic north, and grid north; describe the way a magnetic compass functions relative to these, and possible sources of error in using a magnetic compass. **

3. Point out the North Star. * *and describe the way the moon and stars may be used to roughly determine direction.* *

4. Explain briefly and completely * *the sun's track across the northern hemisphere sky and* * the use of the sun's shadow to determine direction.

5. Briefly explain and give examples of the use of the following land navigation concepts:
   a. catching features;
   b. "collecting" features;
   c. attack points;
   d. aiming off; and
   e. coarse and fine orienteering.

6. Given only a 7.5 minute topographic quadrangle or an orienteering map with an attack point and a target plotted on it, and a standard orienteering compass * *(or a protractor and straightedge)* *, reliably and accurately:
   a. calculate the true bearing from the attack point to the target;
   b. calculate and set on the compass the magnetic bearing to the target; and
   c. follow the bearing accurately, including triangulating and boxing around obstacles.

7. Correctly locate a position on a topographic map, given:
   a. the bearings to two landmarks indicated on the map (resection); or
   b. the bearing to one landmark indicated on the map, and the information that the position is on a specified linear feature (modified resection).

8. Given bearings from two locations to a target, correctly locate it on a topographic map (triangulation).

9. Consistently complete basic-level point-to-point orienteering courses.

D. Basic Level Technical Standards: *Search*

The candidate must be able to perform the tasks listed in the following items:

1. Briefly explain the following search concepts:
   a. passive and active search methods;
   b. clue finders and subject finders;
   c. containment;
   d. binary search and cutting for sign;
   e. the hasty search; and
   f. the "bastard search."

2. Define and outline the five phases of lost person search operations as set forth in the ASRC Search and Rescue Operations Plan (SAROP).

3. Identify the positions and their corresponding duties:
   a. on a Field Team;
   b. on a Quick Response Team; and
   c. on the ASRC Mission Staff.

4. Outline the standard procedures for:
   a. hasty search tasks;
   b. scratch search tasks;
   c. survey search tasks;
   d. perimeter search tasks;
   e. sweep search tasks;
   f. saturation search tasks;
   g. patrol search tasks;
   h. camp-in search tasks;
   i. marking of clues and boundaries;
   j. reporting and managing clues (both downed aircraft and lost person searches);
   k. reporting and managing finds (both downed aircraft and lost person searches);
   l. man-tracking tasks;
   m. tracking dog tasks;
   n. air-scenting dog tasks;
   o. interrogation search tasks;
   p. visual search tasks;
   q. Emergency Locator Transmitter search tasks; and
   r. locale search tasks;

5. With the use of gear normally carried in the candidate's mission pack, recall the standard:
   a. ground-to-air panel signals;
   b. air-to-ground aircraft signals;
   c. helicopter landing zone preparation and marking; and
   d. rules for approaching helicopters.

6. Lead a Field Team competently on:
   a. scratch, survey, perimeter cut, sweep, and saturation search tasks; and
   b. interrogation and visual search tasks.

7. Reliably use VHF-FM mobile and handheld radios to communicate mission information, including:
   a. adjustment of channel, volume, squelch, and PL (CTCSS) controls;
   b. using the ASRC radio SOP, including proper station identification and observance of FCC regulations, proper use of prowords, and use of the ICAO (ITU) phonetic alphabet; and
   c. describing various techniques for improving marginal communications encountered while using VHF-FM handheld radios.

8. Outline the delegation of authority and responsibility for search and rescue in Virginia, West Virginia, and Maryland.

9. Briefly explain how the following legal concepts apply to search and rescue operations:
   a. Good Samaritan laws;
   b. civil suits and criminal actions;
   c. standards of care;
   d. the right to emergency assistance and duties to provide emergency assistance;
   e. abandonment;
   f. implied consent;
   g. entry, during missions, upon private property posted "No Trespassing;"
   h. crime scene protection;
   i. declaration of death and confirmation of death; and
   j. confidentiality.

E. Basic Level Technical Standards: *Mountain Rescue*

The candidate must be able to perform the tasks listed in the following items:

1. Correctly tie, contour, and back up the following knots:
   a. bowline;
   b. water knot (overhand bend, ring bend);
   c. figure eight loop;
   d. Prusik knot;
   e. Headden knot;
   f. square knot;
   g. barrel knot and barrel bend (double fisherman's knot, grapevine knot);
   h. clove hitch; and
   i. the ASRC seat harness.

2. Demonstrate the following rope handling techniques:
   a. coiling and uncoiling a mountaineer's coil;
   b. stacking and inspecting the rope;
   c. rigging to an anchor using:
      i. a bowline,
      ii. a tree wrap and tie-off, and
      iii. loop webbing slings; and
   d. casting, padding, and rigging static lines.

3. Belay competently, including:
   a. proper anchorage, tie-in, stance, and aim; and
   b. correct calls, up rope, slack, and fall-catching.

4. Demonstrate competence in braking litters with tree wrap belays and with figure eight descenders.

5. Correctly coach and supervise an untrained litter team in a non-technical evacuation, including toenailing, laddering, and rotation of litter bearers.

6. Serve competently in all positions on a semi-technical evacuation team, including:
   a. serving as rope team member with tree wrap brakes and with figure eight descender brakes;
   b. rigging and directing a brute-force hauling system; and
   c. serving as rope team member with a brute-force hauling system; and
   d. serving as litter captain.

7. Properly load and tie a patient into a Stokes litter, and rig it for semi-technical evacuations.

8. Rappel properly with:
   a. the arm rappel (French arm rappel, back rappel);
   b. the dulfersitz ("hotseat") body rappel;
   c. a figure eight descender (single and double wrap);
   d. a carabiner wrap; and
   e. a long rappel rack.

9. Demonstrate the knowledge of, and ability to care properly for, ropes and technical rescue equipment.

[10. BOTTOM BELAY]

[11. BASIC ASCENDING]

F. Basic Level Technical Standard: *Emergency Medicine*

The Basic Member must meet each of the following requirements:

1. Certification
   a. Possess a current certificate as an Emergency Medical Care--First Responder by an agency adhering to the Department of Transportation 40-hour course or better; or
   b. Possess a current American National Red Cross Advanced First Aid and Emergency Care card; or
   c. Demonstrate to the satisfaction of the Training Officer equivalent training and ability.

2. Vital Signs
   a. Possess an American National Red Cross card for Vital Signs: Blood Pressure; or
   b. Demonstrate proficiency at taking palpated and auscultated blood pressures.

3. Demonstrate the ability to properly use oropharyngeal airways, oxygen delivery systems, and pocket masks for respiratory resuscitation.

4. Possess a valid American National Red Cross or American Heart Association 2-rescuer Basic Cardiac Life Support (Cardio-Pulmonary Resuscitation) card.

Note that EMT certification fulfills items 1, 2, and 3, but does not in itself satisfy item 4.

V. RESCUE MEMBERSHIP

A. General

1. To become a Certified Rescue Member, an applicant must:
   a. Have been an ASRC member in good standing for at least one year;
   b. Have participated in two ASRC search missions or ASRC simulated searches within the two years prior to consideration for Rescue membership;
   c. Meet the technical standards and requirements of this Section, as determined by the Training Officer;
   d. Possess the personal equipment to serve as a Quick Response Team Leader, as a Field Team Leader for a winter search task, and as the Rescue Specialist on an evacuation;
   e. Receive a favorable subjective evaluation by the Training Officer regarding the applicant's overall competence to perform the duties expected of a Rescue Member.

2. Rescue members must complete annual continuing education requirements, maintain skills proficiency, and pass an annual review as explained in Section I. In addition, each Rescue Member must participate in one actual or simulated ASRC mission each year.

B. Rescue Level Technical Standards: *Survival and Wilderness Travel*

The candidate must be able to perform the tasks listed in the following items:

1. Travel cross-country competently in a middle Appalachian wilderness area in the winter, including:
   a. winter stream and ice crossing;
   b. traveling deep powder snow; and
   c. using instep crampons or creepers on steep snow and icy areas.

2. Bivouac overnight with normal mission pack gear in winter, and carry out mission tasks for a full day following.

3. Properly and safely use the techniques of free lead climbing, and lead fifth class rock (i.e., 5.0 or harder by the Yosemite decimal system) in summer, spring, or fall.

C. Rescue Level Technical Standards: *Search*

The candidate must be able to perform the tasks listed in the following items:

1. Briefly, but intelligibly, describe the implications of the following search concepts to lost person search operations, and use these concepts to discuss the uses and limitations of search resources, such as trained and untrained foot searchers, man-trackers, air-scenting dogs, and tracking dogs:
   a. passive and active search methods;
   b. clue finders and subject finders;
   c. containment;
   d. binary search and cutting for sign;
   e. the hasty search;
   f. the "bastard search;"
   g. the relative efficiency of close-spaced line searches versus repeated wide-spaced line searches;
   h. compatible and incompatible search resources; and
   i. probability of detection (POD).

2. Given a lost person search scenario, a topographic map of the area, and an ASRC OPSKIT, set up initial search priorities, using the standard ASRC Strategy Map symbols. Describe the application of each of the following approaches to the development of strategy:
   a. the statistical method;
   b. the historical method;
   c. the simple containment method; and
   d. the Mattson Consensus Method.

3. Given a search scenario, and ASRC OPSKIT, and a completed Strategy Map, use the Task Assignment Procedure to generate a set of appropriate tasks to complete the initial strategy with the given resources, fill out a Task Assignment Form properly for each task, and start a Status Map using the standard ASRC symbols.

4. Given a matrix of search areas with Probability of Area (POA) for each, and a set of search resources with POD and search rate for each, assign resources to tasks and calculate overall Probability of Success (POS).

5. Given a search scenario and an ASRC OPSKIT, calculate the Time Frame for Survival (TFFS) and explain its significance and uses.

6. Describe in outline the standard procedure for a search for a missing light civil aircraft, including the role and structure of the Civil Air Patrol (CAP) and the appropriate role to the ASRC in aiding the CAP.

7. Competently lead a team on an ELT search task.

8. Use the standard ASRC logging procedure and message forms, and use and update a Communications Systems Chart.

9. Describe those characteristics of HF (high frequency), ASRC VHF-FM (very high frequency -- frequency modulation), Public Service VHF-high band, and amateur 2 meter radio communications which are relevant to search communications planning.

D. Rescue Level Technical Standards: *Ropework*

The candidate must be able to perform the tasks listed in the following items:

1. Correctly tie, contour, and back up the following knots, and describe each in terms of strength, security, and proneness to jamming, and discuss appropriate and inappropriate uses of each:
   a. bowline;
   b. "double strength" bowline;
   c. bowline-on-a-coil;
   d. bowline-on-a-coil around anchors;
   e. bowline-on-a-bight;
   f. three-loop bowlines;
   g. overhand knot and overhand bend (water knot, ring bend);
   h. figure eight knot, bend and loop;
   i. barrel knot and barrel bend (double fisherman's knot, grapevine knot);
   j. sheet bend and double sheet bend;
   k. square knot;
   l. butterfly knot;
   m. anchor hitch;
   n. clove hitch;
   o. tautline hitch;
   p. the ASRC seat harness;
   q. the Parisian baudrier chest harness; and
   r. the crossed-loop chest harness.

2. Rappel properly with the following methods, and discuss the advantages, disadvantages, and appropriate uses of each:
   a. the arm rappel (french arm rappel, back rappel);
   b. the Dulfersitz (hotseat) body rappel;
   c. single and double wrap on a figure eight descender;
   d. double carabiner-brake bar rappel;
   e. carabiner wrap rappel;
   f. six carabiner rappel;
   g. Munter (UIAA, Italian friction) hitch rappel; and
   h. long rappel rack rappel.

3. Rig and use multiple-step pull-down rappels.

4. Assemble and ascend properly with the following devices, and describe each in terms of strength, security, holding strength, jamming, special hazards, and appropriate uses:
   a. Prusik knots and three-wrap prusik knots;
   b. Bachmann knots;
   c. RBS and Headden knots, formed both with rope and with webbing;
   d. Gibbs ascenders; and
   e. Jumar and similar ascenders.

5. Tie and discuss the appropriate uses of the following "escape ascenders:"
   a. the French Prusik knot; and
   b. the end-of-rope self-Prusik.

6. Construct and ascend with the following ascending rigs:
   a. Texas and Texas "Y" rigs;
   b. classic three-knot rig;
   c. three-cam "ropewalker" rig;
   d. modified climber's Jumar-etrier rig; and
   e. Mitchell system.

7. Belay confidently and competently with:
   a. the sitting hip belay;
   b. the standing hip belay in the context of tree-belaying a litter;
   c. the Munter (UIAA, Italian friction) hitch belay; and
   d. the belay plate.

8. Coil and tie off ropes in:
   a. a mountaineer's (knee-foot) coil;
   b. a lap coil;
   c. a multiple-strand chain coil;
   d. a quick-release "rescue" coil; and
   e. a skein "backpack" coil.

9. Rig static lines in diverse situations, including:
   a. casting lines through brush or past obstructions;
   b. defouling lines;
   c. assessing abrasion hazards, padding, and rigging offset lines with directional anchors;
   d. rigging horizontal (Tyrolean) traverse lines; and
   e. rigging diagonal lines.

10. Select, place, and rig anchors both for individual use and for evacuations, including:
   a. the evaluation of and use of trees and rock formations;
   b. the placement of and evaluation of chocks, pitons, and expansion bolts;
   c. tree wrap rigging;
   d. the proper rigging of two self-equalizing anchors with a single loop sling; and
   e. the proper rigging of a self-equalizing system for several anchors.

11. Using the candidate's choice of the rappel methods described in item 2 (except the Dulfersitz or arm rappel), the candidate's choice of the ascenders described in item 4, and the candidate's choice of the ascending rigs described in item 6, do the following:
   a. rappel and ascend past overhangs and breakovers;
   b. rappel and ascend through narrow chimneys;
   c. rappel and ascend on diagonal slopes;
   d. tie off, rest, and invert (both rappel and ascend);
   e. rappel without the use of hand control;
   f. rappel and ascend past knots;
   g. change from rappel to ascend and ascend to rappel while on the rope; and
   h. use rappel and ascending techniques to traverse slack horizontal and diagonal lines.

E. Rescue Level Technical Standards: *Mountain Rescue*

The candidate must be able to perform the tasks listed in the following items:

1. Using the local Group's regular Stokes litter and rigging, assemble the litter, load and secure a patient properly into the litter, and rig the litter properly for:
   a. semi-technical evacuations;
   b. vertical evacuation with one rope, with top brakes;
   c. vertical evacuation with one rope, with top brakes, with litter vertical;
   d. vertical evacuation with one rope, with traveling brakes;
   e. vertical evacuation with two ropes and top brakes; and
   f. hoisting to a helicopter in hover.

2. Properly load a patient onto a D-ring ("Army") stretcher, to secure the patient, and rig the litter for a semitechnical evacuation.

3. Using a standard bare Stokes litter and an assortment of slings and carabiners, improvise all the types of rigging listed in (1).

4. Rig and demonstrate the use of the following haul systems:
   a. Yosemite haul and 2:1 and 4:1 (theoretical) variants;
   b. simple and piggyback Z hauls;
   c. simple and piggyback 4:1 (theoretical) Z hauls; and
   d. offset vertical counterweight haul.

5. Rig, tighten, and use horizontal and diagonal high tension (Tyrolean) traverse lines for personnel, equipment, and patients in litters.

6. Use the following braking systems for evacuations:
   a. tree wrap;
   b. figure eight descender;
   c. multiple carabiner brake; and
   d. rappel rack brake.

7. Competently perform the following solo rescue techniques:
   a. rescue of a person who is incapacitated while ascending on a static line, by the use of the same static line, ascenders, and a rappel device;
   b. rescue of a person who is dangling on the end of a top-belay line, using a separate static line for access and lowering; and
   c. rescue of a person who is in the middle of a rappel on a static line with a jammed rappel device, using a separate static line for access.

8. Given a length of 2" webbing and assorted slings and carabiners, rig and use a Tragsitz-type harness for a mixed vertical and diagonal lowering.

9. Use standard third-man techniques to load a patient into a litter on a vertical wall.

10. Given a (simulated) conscious victim without severe injuries or illness and only the end of a haul line, tie the victim into the end of the line securely for a vertical lifting.

11. List and explain the actions to be taken upon entering the scene of an aircraft crash.

12. List and describe the the phases of extrication, list and describe the standard field-portable forcible-entry and extrication tools, and describe the use of these tools in extrication of persons from light civil aircraft.

13. Safely and effectively employ the tools and techniques described in (12).

14. Set up and mark a rural landing zone and a wilderness helispot, guide a helicopter with standard body signals, to load a patient into a grounded helicopter, and serve as a ground crew leader for a helicopter hoist evacuation.

F. Rescue Level Technical Standards: *Emergency Medicine*

1. The Rescue member must be certified as an Emergency Medical Technician (EMT) at a basic or advanced level by Virginia, the National Registry of EMT's, or a state with basic EMT reciprocity with Virginia.

2. The Rescue Member must possess a valid American National Red Cross or American Heart Association 2-rescuer Basic Cardiac Life Support (Cardio-Pulmonary Resuscitation) card.

V. AUXILIARY MEMBERSHIP

A. General

In addition to meeting the requirements of the ASRC Bylaws, each Auxiliary member must possess suitable outdoor equipment for participation in saturation and sweep search tasks (as specified by the Group Training Officer), and have completed an ASRC Auxiliary Training Session containing a minimum of four hours of classroom and field training as listed below.

Auxiliary membership is valid for a period of one year. Auxiliary membership may be renewed by any one of the following:

1. Completion of another Auxiliary Training Session;
2. Participation in the field on an ASRC search mission; or
3. Participation in the field on an ASRC search simulation.

B. Topics for Auxiliary Training Sessions

1. The ASRC: its organization, its activities and capabilities, and the role of Auxiliary members.

2. Elementary short-term survival:
   a. short-term survival priorities;
   b. the heat balance of the body;
   c. ways heat is lost and ways to combat them;
   d. the physiology of heat loss, including exhaustion and fatigue;
   e. problems of cold weather: hypothermia and frostbite;
   f. problems of hot weather; heat exhaustion, heat cramps, heat-stroke, and dehydration; and
   g. general survival principles.

3. Search operations:
   a. operations and organizations;
   b. tactics;
   c. line search: sweep vs. saturation, and grid vs. contour;
   d. line search calls, guiding left or right, flagging, and other aspects of running a search line; and
   e. how to be a clue-conscious searcher.

4. A field exercise in line searching.

5. (Optional: a field exercise in non-technical evacuations.)

VI. ASSOCIATE MEMBERSHIP

Beyond the requirements of the ASRC bylaws, there are no technical standards to which Associate members must be held.

VII. SUSTAINING MEMBERSHIP

Beyond the requirements of the ASRC Bylaws, there are no technical standards to which Sustaining members must be held.

APPENDIX: THE ASRC UNIFORM

INTRODUCTION

From the beginning of the ASRC, members wore the ASRC patch on their shirts or parkas. In the mid-1970's, the Blue Ridge Mountain Rescue Group adopted a uniform shirt, consisting of a blue workshirt with an ASRC patch on the left sleeve, an EMT or similar patche on the right sleeve, and a blue plastic nametag over the right breast pocket. A few years later, the Shenandoah Mountain Rescue Group adopted a similar uniform, and at the 1983 ASRC General Membership Meeting, this was established as the official ASRC uniform.

Before there was an ASRC uniform, only Certified Members could wear the ASRC patch. It served not only as an organizational patch, but also as the mark of an ASRC Certified Member. (BRMRG and SMRG Trainees and Associates wore only a blue shirt with an EMT or first aid patch and a blue nameplate.) When an ASRC-wide uniform was established (at the 1983 meeting), the ASRC patch became an integral part of the uniform for all uniformed members, not just Certified Members. Since the ASRC patch no longer identified Certified Members, a small Mountain Rescue Association patch over the left breast pocket became the new ASRC certification mark. (The ASRC joined the Mountain Rescue Association (MRA) in about 1980, and from that time all ASRC Certified (Basic and Rescue) Members become MRA "Rescue" Members as well, and therefore have the right to wear the MRA patch. Trainees and Associates are classed as MRA "Support" Members, and there is a MRA patch with SUPPORT under the logo for these members, but this patch was not adopted as part of the ASRC uniform in 1983.) Now that the privilege of wearing the ASRC patch has been extended to Trainees and Associates, the standards for Trainee Membership have been upgraded, and Associates who wish to wear the uniform are required to meet the Trainee standards.

WHO WEARS THE UNIFORM?

The ASRC uniform may be worn by Certified Members, Trainee Members, and those Associate Members who have met all requirements for Trainee Membership; Associates who will serve only in Base Camp need not acquire any technical ropework equipment required of Trainees.

UNIFORM SPECIFICATIONS

The ASRC uniform is a Sears or similar blue chambray work shirt, with:

a. on the left shoulder, a standard ASRC patch;
b. on the right shoulder, a Virginia, National Registry, or other approved EMT or First Responder patch, or an American National Red Cross Standard or Advanced First Aid patch, with any appropriate rockers (these patches shall conform to the member's current certification);
c. over the right breast pocket, a 3/4" x 3" blue plastic nametag, with white lettering denoting the member's name and Group; and
d. over the left breast pocket, for all Certified Members and Certified Members only, a small (2-1/4") Mountain Rescue Association patch.

No other patches or emblems are to be worn on the uniform shirt.

Members with the right to wear the ASRC uniform shirt may affix patches and a nametag to personal parkas or other outer garments, provided that they are in the same positions as are specified for the uniform shirt, and provided that no other patches or emblems are worn on the garment.