Introduction

The purpose of this chapter is to introduce you to the types of equipment and procedures that you can expect to use during operations and weekend exercises with the Mountain Rescue Team. Although some equipment will vary from team to team, many items are standard throughout the Mountain Rescue Service. The type of basecamp will also vary, from a bunkhouse or village hall with a fully equipped kitchen, heating and showers, to tents which may be many miles from any amenities and with only a limited water supply. Some equipment will be used regularly, whereas other items like tents and auxiliary lighting may be used only occasionally.

As a member of the team, you will be expected to assemble, carry out checks on, and use all the equipment safely and effectively. Initially this will be done under the supervision of a Party Leader or Trained Team Member. When you are considered proficient, you will be expected to carry out these tasks without supervision.

Mountain Rescue equipment is categorised into one of 3 groups - Critical, Protective or Utility.

Cookers and Heaters

The mobile cooker used by teams is the Mark 5 Field Cooking Outfit. This cooker has been converted from gasoline to propane and consists of 4 main burners complete with oven. Each burner can be controlled independently, while a central control that adjusts the air flow to the cooker is also present. Setting up the cooker is best taught practically; however, here are a few guidelines and safety notes:

REMEMBER:

1. Always ensure that the cooker is on a firm, flat surface.
2. Check that all parts of the cooker are connected correctly.
3. The connection to the gas bottle is a left hand thread.
4. The gas bottle is to be accessible in case of a fire and placed at the fullest extension of the gas pipe. It should be stored upright and secured in position.
5. Check that the cooker does not contain combustible or pressurized items before lighting.
6. When lighting the cooker check that all the burners are working, that no gas is escaping, and that there is no smell of gas.
7. Ensure the cooking area is well ventilated.

Further information can be found in the AC 40081 Cooking Outfit Field No 5 handbook.

Other items of basecamp equipment that are powered by gas are the Bullfinch single and double burners, used both for heating and cooking. The output of these burners is over 12 kW per burner and it is important that the burners have adequate ventilation and free space available. The British Standard Codes of Practice state that ventilation must be provided by at least 2.2 cubic metres of
free air for each kW of heat. A single Bullfinch burner would therefore require almost 27 cubic metres (3m x 3m x 3m) for safe operation. This ventilation is in addition to that required for other appliances and for the occupants themselves. If the area is to be used for sleeping, all gas appliances must be turned off before retiring for the night.

Another type of space heater in current use is the Andrews Heater. This is a propane heater which is fitted with an electric fan. It is essential that the instructions are followed to ensure safe and successful start up procedure.

**Lightweight Cooking Stoves**

There are quite a wide variety of stoves available for expedition, or overnight camping. Their use tends to centre around one of four types of fuel:

a. Gas
b. Methylated spirits
c. Solid fuel blocks
d. Petrol/paraffin

**Gas**

Gas is clean, self-contained, handy to pack, and has a relatively fast boiling time. The example in FIG.190a takes just 4 to 5 minutes to boil 1 litre of water. It is however difficult to use effectively in even medium winds, and you need to carry additional gas cartridges which are both bulky and add weight.
Meths Stoves

For most people, meths stoves means the Swedish Trangia which is both stove and all associated cooking pots/frying pan, and even kettle. (See FIG:190b). Whilst on the face of it the boiling time appears 2 to 3 times longer than the gas stove, it not only will stay alight in almost any weather, it actually boils quicker as the wind speed increases!

The main advantage of the Trangia is that it is a simple stove to light, and is an engineering masterpiece at getting everything into a relatively small space. The pots themselves will just about hold two peoples’ main meal, thereby saving weight and space. The real drawback is that the methylated sprits must be carried in a separate and leakproof container, and from a fuel efficiency viewpoint, it takes up to 3 times as much fuel for a meths stove than the most efficient alternatives. It is its absolute reliability to light and stay alight that most people like. Be warned however, in direct...
sunlight, meths burns with an almost invisible flame, and more than one person has burnt his hands on a meths stove which they thought had been put out.

**Solid Fuel Block Stoves**

One of the simplest stoves available, using a solid fuel block, rather like a large firelighter. Their main, perhaps only, advantage, is that they are very lightweight. They smell awful in confined spaces, and take an age to boil and give off noxious fumes. Overall, their use is not recommended.

**Petrol/Paraffin Stoves**

These stoves tend to operate with the fuel under pressure, and they produce a high heat output. The stove in FIG.190c will boil a litre of water in 6 to 7 minutes, almost irrespective of weather conditions, in that respect it has the fast boil time of gas, with the windproofing of the Trangia meths.

The big disadvantage is the fuel. Petrol obviously needs a leakproof container, it is highly volatile, and therefore always potentially dangerous, plus it produces carbon when it burns, and tends therefore to clog up the fine pressure jet hole. So much so that all petrol stoves come with some sort of jet cleaner.
Summary of Stoves

When selecting a stove for use in the mountains, perhaps the two main priorities are lightweight, and the ability to light easily and under most weather conditions. Speed of boiling is usually only of academic interest, since by the time you stop for your evening meal, you have all the time in the world!

Allowing for the fact that the Trangia meths stove includes 2 cooking pots, and maybe a small kettle, it is probably the lightest stove after the solid fuel block. When it comes to reliability to light and stay alight, it is well ahead of the field.

Lighting

The types of lighting used includes electric festoon, gas lamps and “laser-slam” lights. The festoon lighting comprises of a two core cable which can be powered either from battery, generator or mains electricity. The light sockets are attached to the cable where required and have two pins which pierce the cable to obtain power. Ensure that the bulbs fitted are compatible with the power supply. They can be either 240v, 24v or 12v depending on the system used.

Tilley lamps are used very occasionally, and it takes a certain amount of practice to light them correctly. They are fuelled by kerosene and require methylated spirits to prime the element. Care and patience are needed when priming and lighting tilleys:

1. Ensure that the tilley is serviceable, (new mantle).
2. Ensure that the correct fuel is used.
3. Carry out lighting in the open, FAFA to be available.
4. Allow time for the meths to heat the mantle and feeder line before opening the valve to the kerosene reservoir.
5. Once alight check routinely for leaks and loss of pressure.

Propane gas lights are used by some of the teams, the precautions and checks are the same as for other gas appliances.

Tentage and Campcraft

The use of tents by the MRS is less frequent nowadays than in the past, but this does not mean that campcraft and tent erection should be neglected. When tents are required it is usually a matter of urgency and it is likely to be at night, windy and raining.

The tents that are most commonly used by the MRS are the:

a. 12 x 12 (12 x 24) Basic Shelter
b. The Mountain Quasar

The most frequently used is the 12 x 12 Basic shelter, either as accommodation or as a cook tent. A larger, 12 x 24 shelter can be constructed by lacing two 12 x 12 tents together.

FIGS:190d - 190g show the frame and one method to fully erect a 12 x 12 tent:
FIGS:191a - 191d show the Mountain Quasar 2-man tent used for Radio Links and Expeditions.
The following points should be taken into account when siting and erecting tents:

1. Is the tent serviceable?
2. Have you all the equipment and tent components to complete the task?
3. Is the site level and well drained or liable to flooding?
4. Is the ground suitable for tent pegs (loose or stony)?
5. Is the site prone to strong winds, if so, can the tent be lashed down easily?
6. Avoid having too many assistants when erecting the tent, (too many cooks etc).
7. Ensure all fire precautions are taken.

Once the tent has been erected, periodic checks must be made on the guylines and lashings to ensure that they are still secure and not becoming too loose or tight.

The Mountain Quasar will normally be used as a link, crash guard or expedition tent. It is a lightweight (3.8 kg), two-man tent of geodesic dome design, giving good accommodation space combined with great strength and stability. **FIG:191** shows the Mountain Quasar inner and outer tents, and the high altitude variant.

After use all tents should be dried naturally and checked for damage or deficiencies, which should be rectified before the tent is put away, or next used.

Whether the site is a basecamp or a single tent, various guidelines should be followed:

1. Any waste should be double bagged in polythene bags and disposed of at regular intervals if you are on the site for a period of time.
2. Toilet facilities need to be adequate for the amount of people. In remote areas, consideration must be given to environmental aspects and prevention of water contamination, particularly if it is a popular area.
3. Open fires are not condoned by the MRS and should only be used in an emergency.
4. On departing the campsite it must be left in the condition that you found it, if not better. All litter must be taken with you and any damage to walls etc repaired. Good liaison with the landowners and the general public is of the utmost importance. This must be appreciated on campsites, in climbing huts/bothies and village halls. Try and limit the amount of noise around the basecamp and avoid unnecessary revving of vehicle engines, slamming of doors and shouting, particularly in the early morning and late at night. Always respect the feelings and attitudes of others. Not only would the reputation of the MRS and the RAF be damaged by such thoughtlessness, it could also result in future access to certain areas and basecamps being denied.

CARE OF EQUIPMENT - LOOKING AFTER YOUR KIT

Thanks to the efforts of those who have gone before, members of RAF Mountain Rescue Teams are now among the best equipped in the land. The clothing and equipment you are issued with has been specifically designed, manufactured and selected for mountaineering and mountain rescue activities. This specialist kit is both expensive to purchase and to replace and although it may appear to be tough and hard-wearing, it will require care and attention to guarantee maximum serviceability and useful life. The policy for maintaining Mountain Rescue Equipment (MRE) is laid down in AP 108A-0301-1. A record of all lifed equipment and its 6 monthly maintenance must be maintained in your MRS Log Book. This maintenance is to be carried out by a competent person as described and authorised in your Training Record Book.

The most important point to bear in mind considering team equipment is to “treat it as your own”, and not as a piece of “free” kit that can be used, abused and exchanged at will. Remember, your life may one day depend on your kit, so look after it!

Many of the items of equipment issued to team members have been designed for specific tasks and it is not possible to list each and every item and how it should be cared for. The following paragraphs include general advice with more specific instructions given where considered necessary. Much useful information can be gleaned from the manufacturers labels attached to new items of clothing and equipment. Don’t discard them until you have read them! The British Mountaineering Council booklet Care and Maintenance also provides excellent advice and information.

Goretex Clothing and Bivi-Bag

Goretex is a man-made material that, while keeping the rain out, will allow your body to breathe, so getting rid of body moisture. If it is not kept clean, Goretex quickly loses this ability to “breathe”, as the tiny holes which would normally allow body moisture to escape become clogged with salts (sweat) and grime.

Goretex items should be washed in warm water using natural soap flakes (detergent powders also block up the holes in your Goretex!). The items should then be tumble dried on a cool setting. Any holes or tears should be repaired immediately (this can be arranged through your team supplier using RAF channels).

To gain maximum serviceability from your Goretex clothing, the manufacturers recommend that the items be ironed after washing, using a cool iron.
Down Clothing and Sleeping Bags

Those items of equipment which include a down filling are duvet jackets and sleeping bags. Down is light, compact and can provide superb insulation against the cold but only if it is given due care and attention. Duvet jackets and sleeping bags should not be stored at the base of your hill bag or in a stuff sac for long periods of time. This will cause the down to “collapse” and will reduce its insulating properties and shorten its life. Jackets and bags should be regularly removed and “shaken out” before being allowed to air naturally or placed in a tumble drier on a cool setting.

They should also be kept dry as the down will lose virtually all of its insulating properties if allowed to become wet. Being a natural product, it is also prone to mildew. Any tears in the outer covering of your jacket or sleeping bag should be repaired immediately to prevent the down filling “escaping” although, in truth, this is hard to achieve.

Down items can be washed, although the manufacturer’s advice should always be followed and over-frequent washing is not recommended. If you do wash your sleeping bag or duvet, or they become wet through use, it is essential that they are thoroughly dried immediately. This is best achieved by a prolonged tumble dry on a cool setting.

Synthetic Clothing

Items made of synthetic materials (fleece, thermal underwear, sleeping bags etc) are generally much more resilient and hardwearing that down-filled garments. Although they lack the superb insulating properties of down when dry, they do not suffer from the same down-grading of insulation properties when wet. These items will usually stand frequent machine washing without a significant loss of performance, although once again, the manufacturer’s advice should always be followed, particularly with regard to tumble drying.

Leather Boots

Leather boots can give years of service if they are well cared for and can often be re-soled when necessary and so extend the life of your “favourite” boots. The worst enemy of leather boots is the team drying room, into which boots are all too often deposited and forgotten about, only to be removed much later after they have been transformed into shrunken and ironhard images of their former selves!

The correct way to dry out your leather boots is naturally ie in a warm (but not hot!), well ventilated environment. If they are soaked, it will help speed up the drying process if they are stuffed with some absorbent material such as newspaper.

Boots should be regularly treated with a good quality wax waterproofing agent (dubbin tends to rot stitching). Cleaning and polishing with proprietary brands of shoe polish will also help maintain the water-resistant properties and appearance of your boots.

Plastic Boots

Plastic mountaineering boots have been in use for some years and have proved ideal for climbing in winter, the Alps or the Greater Ranges. They consist of a resolable plastic outer shell and a leather or man-made removable inner boot. They are lighter and require less maintenance than their all leather equivalent.
The outer shell, being plastic and impermeable, is quick to dry and may be cleaned using a hard brush and soapy water as necessary. The inner boot can be washed in warm water with soap flakes, having first removed the inner sole (which can also be washed), before being allowed to dry naturally, as for leather boots.

Being primarily a winter-season boot, you should ensure that any re-soling is carried out before the onset of winter. Your team supplier will arrange re-soling given adequate notice.

**Crampons**

Team members may be issued with two types of crampon; one pair for steep ice climbing, and one pair for general mountaineering use. Both should be dried thoroughly after use and any corrosion removed. Frequent checks should be made of the metal frame of the crampon for fatigue cracks, particularly in the front point area. Annual Non-Destructive-Testing (NDT) is recommended to locate any “hidden” cracks. Straps and bindings should also be checked regularly and repaired/replaced as necessary and any nuts and bolts checked for security.

Crampon points should be kept clean and sharp although there is no need for them to be sharpened to a fine point as they will only be blunted “first time out” and are a potential source of injury to the unwary. Also remember to protect other, easily damaged items of clothing and equipment from the newly sharpened points of your crampons!

**Ice Axe & Hammer**

Two types of ice axe are issued to team members - the curved pick “general mountaineering” axe and the reverse curve “technical” axe, with its sister hammer. Axes may be constructed from a variety of different steels and alloys and are prone to corrosion if not kept dry and clean when not in use. Guidelines for sharpening and maintaining your axe/hammer are as follows:

a. **The Pick.** This should have a sharp, chisel tip and must be re-sharpened using the original shape as a guide. Regular checks should be made to ensure that the pick is not cracked or been bent in use and that any securing bolts are tight. Polishing the pick using emery cloth and metal polish can reduce the likelihood of the pick cracking.

b. **The Adze.** Again this should be kept sharp, though not razor-sharp, using a file on the underside of the adze only. Any burrs should be removed.

c. **The Shaft.** Check the shaft for straightness, dents and the presence of cracks, particularly around the head and any rivets. Do not cover the rivets with identification tape. Check the ferrule and spike for security.

d. **The Spike.** Keep the spike sharp and check that it is securely attached to the ferrule and shaft.

e. **The Sling.** The sling is an important part of the ice axe and should be regularly checked for wear and damage. It is recommended that you replace ice axe slings at the beginning of every winter, making sure that new slings are of the correct length. Any knots must also be checked to ensure that they are secure and have not slipped.
Ropes

All ropes (stretcher lowering and climbing) may be washed, depending on usage, either by hand in warm water, or machine washed on a warm setting with natural soap flakes. Detergent or biological soap powder should not be used.

Ropes should be left to dry naturally in a well ventilated area out of direct sunlight. They should be hung loosely, not coiled and should never be dried in the team drying room, tumble drier or by direct heat. When not in use, ropes should be stored in a dry, well ventilated room away from direct sunlight and well away from any chemicals, oils, or corrosives.

Before and after use inspections should be carried out on every occasion that the ropes are used and in addition to the 6 monthly maintenance checks. Climbing ropes should be replaced after 5 years’ use, or sooner if necessary (see Chapter 13 for more details).

Climbing Harnesses and Tape Slings

The care of harnesses and slings is as for ropes, with additional checks required for stitching damage and security. Again, as with ropes, slings and harnesses they should be replaced after 5 years’ use, or earlier if required.

Climbing Helmets

All helmets used by RAF MRS personnel must be UIAA approved. You should check your helmet regularly for damage (tears, breaks, cracks and deformations). Do not make any changes to the straps, seams etc and do not change the colour of the helmet with any type of colouring or paint. As with other climbing equipment, helmets will deteriorate with time and should be replaced after 5 years’ use or immediately if subjected to a severe blow.

Karabiners and Camming Devices

These should be inspected regularly, looking for cracks and insecurity of any pins, swages or moving parts. Check particularly in the corners of karabiners for burrs, wear and sharp edges which could cause failure or damage to ropes and slings. Check also for damage or weakening of trigger wires on camming devices. Karabiners and camming devices should be washed in clean water and thoroughly dried, with any moving parts being lubricated with a small amount of WD40. Any excess should be wiped off as it can contaminate slings and ropes.

It is particularly important that you wash all alloy equipment after sea cliff climbing as exposure to salt laden air (and salt water) can cause corrosion and sticking of karabiner gates and camming devices.

Chocks on Wire

Keep a careful eye on the wire strands and swages and replace if any are damaged or show signs or movement.
Rock Pitons (Pegs)

Rock pitons should be examined for any signs of weakness around the eye, neck and along the back bend of angle pegs. Cracked pegs should be discarded and any burrs or sharp edges removed. Being made of steel, they should be thoroughly dried after use to avoid corrosion.

Ice Screws

Examine for any signs of weakness, particularly around the eye of ice screws, and take care not to damage the cutting points or threads. If teeth are damaged or bent, they can be reshaped or sharpened using a small file; this is most important with screw-in tubular ice screws which require a good cutting edge to start.

As for crampons, take care also to protect other, easily damaged items of kit such as Goretex jackets and salopettes from the sharp points of ice screws while stored in your rucksack or holdall.

Avalanche Transceivers, Pocketphones and GPS

These are all items of “Hi-Tec” equipment involving electrical power and circuitry and should be protected, as far as possible, from the elements and rough handling. Avalanche transceivers should always be carried inside clothing and should therefore be protected. If they do get wet, they should be allowed to dry naturally away from direct heat and not in the MRT drying room. A visual examination of the transceiver should be carried out before use, looking particularly for damage to and correct operation of the earpiece and receive/transmit controls.

Where the GPS is largely weatherproof and suitable for use in all weathers, pocketphones must be protected from moisture it they are to remain serviceable. If they do become wet, wipe off excessive moisture and inform the Team Wireless Operator on your return to base. Specially designed waterproof cases are available for phones and should be used.

All batteries should be checked and spares carried. Any damage or fault should be brought to the attention of your Team Leader.