Chapter 5

The stretcher is one of the most important items of mountain rescue equipment. Those currently used by RAF MRTs are the Bell Tangent, MacInnes Split, MacInnes Superlight and the Rescue and Medical Quick Stretcher. Various other stretchers are used on occasion to provide knowledge of equipment in use by civilian MRTs and SAR helicopters. These include the Troll Alpine, The Thomas, The Neil Robertson stretcher and the Stokes litter. Although this handbook refers specifically to those stretchers in use by RAF MRTs, the basic methods and operation vary little from model to model and can usually be adapted to suit other stretcher types.

The Bell Tangent Rescue Stretcher

RAF MRTs have been using Bell stretchers for many years and have recently replaced the Bell Mk 3 model with the Tangent, an improved, modular version developed in co-operation with Peter Bell. The stretcher has been designed specifically for casualty evacuation from difficult or remote locations and can be carried or dragged over a variety of terrains. It is equally well suited for use on mountain and moorland, rock faces and gorges. One of the many features of the Tangent is its modular construction. The headguard, skis and carrying handles can all be easily and rapidly removed should their use not be required, thus reducing the weight and bulk of equipment to be transported to the casualty site or allowing the load to be shared. Although the handles are not generally required for crag rescues, they add considerably to the ease with which a loaded stretcher can be carried across almost all other terrain. They must, however, be removed before winching or loading on to a helicopter. The Tangent also features an integral carrying harness, removing the need for separate carrying frames. In this mode, without headguard, skis or handles, the stretcher weighs in at 14.25kg. Features retained from the Bell Mk 3 stretcher include the 4 stainless steel rings at the corners, providing secure attachment points for ropes etc. and the ability for the stretcher bed to be split into 2 halves for ease of carrying when empty.

The Bell Tangent is versatile, robust and reliable; combining casualty security with ease of use, even in the most demanding situations.

Bell Tangent Assembly Instructions

1. Place the foot end of the stretcher vertically on its end, joint uppermost and underneath surface towards you and either lean this against a support or have another team member hold it steady.

2. Lower and engage the top half of the stretcher, joint downwards, ensuring that no debris becomes trapped between the mating surfaces.

3. Remove all 4 levers from their stowage positions and place them between the respective joint plates. Insert each pin from the outside in and then lock in position by lightly tightening the thumb screw.
Fig 25: The Bell Tangent Rescue Stretcher

Ensure that all retaining wires are arranged so that no loops project outside the stretcher.

4. Fit skis and headguard (but do not yet erect) as required (see below). Place the stretcher on the ground and prepare for casualty loading.
5. Load and secure casualty as injuries permit and as detailed in Chapter 17. Ensure that any unused straps are securely stowed.

6. Fit handles as required (see below).

7. To disassemble the Tangent stretcher, simply reverse the above process (having first removed and stowed the handles); removing headguard and skis as required. Note that stowage clips for the headguard retaining thumbscrews are provided on the headguard canopy, to prevent loss.
Fitting and Removing Skis

a. Ensuring that the narrow section of the ski is outer-most, place the end “U” bracket between the guide plates on the stretcher skid and secure it in place with the pin provided, ensuring that it is correctly oriented.

b. Fit and secure the remaining “U” brackets as above, working toward the centre of the stretcher.

c. Remove the skis by reversing the above procedure, ensuring that the retaining pins are replaced in the “U” brackets to prevent loss.

Headguard Fitting, Erection and Removal

a. The headguard is fitted by 4 “U” brackets and thumbscrews, which secure it to the stretcher frame at the headbar and side-struts. The front stays are then located and secured by “R” clips. The headguard is maintained in the stowed position by a retaining link in the top left-hand corner of the stretcher, using one of the 4 “R” clips.
b. To erect the headguard, first remove the 2 “R” clips and the retaining link from the front hoop. Do not remove any other “R” clips. Pull the front hoop into the vertical position, removing the front stay wires from their stowage pins and replace the wires on the location pegs on the front hoop. Refit the 2 “R” clips to secure the stay wires.

c. Tension the front stay wires using the attached turnbuckles. Note that the stay wires should be as tight as is practicable to fully tension the headguard canopy and so offer maximum protection to the casualty.

d. To remove the headguard from the stretcher carry out the procedure detailed in a. and b. above, but do not tension the front stay wires. Next remove the remaining 2 “R” clips from the lower end of the front stay wires and remove them from their locating pegs. Unscrew the 4 thumbscrews completely, stowing them on the clips provided on the headguard canopy and remove the headguard as one piece.

Fitting and Removing Handles

a. Slide the handle through a corner attachment ring and secure in place with the attached pin, passing it through the flattened end of the handle and into the locating hole in the stretcher frame. Repeat for each handle.

b. Remove the handles by reversing the above procedure.

Bell Stretcher Maintenance

Every moving part should be oiled after any rescue or training exercise. In particular, the headguard tension devices and stretcher joint pins should be lubricated. The stretcher is fully serviced by the manufacturer every 5 years or after every 100 uses.

The MacInnes Superlite Stretcher
The MacInnes Superlite Stretcher is a one-piece, lightweight stretcher that can be easily carried to the scene of an accident by one man using the adjustable, detachable shoulder straps supplied. Its low weight has been achieved by the use of aluminium in its construction and the provision of shortened runners, making the stretcher rather less robust and resistant to damage than the Bell. A transport wheel can be fitted to the stretcher to aid patient evacuation. See Fig 30.

Using the Stretcher

Refer to Fig 30.

1. Unfold the stretcher by unclipping the patient securing strap, which retains the two folding sections of the stretcher bed.

2. Lock the stretcher in the open position by inserting the locking pins from the inside, through the alloy channel brackets and stretcher bed tubes. On the rear folding section, (with head protector) the stretcher bed angle can be adjusted for patient comfort (only if injuries permit).

3. Patient securing straps are fitted with double quick-action buckles for securing the upper part of the patient. These chest straps should be wrapped around both patient and stretcher, avoiding any injury site. This also avoids excessive strain on the quick-action buckles. The side bearer straps can be deployed for further securing of the patient by tying them across the stretcher.

4. The chest strap can be used by taking it under the patients armpits and securing over the chest if there are no chest or respiratory complications.

5. Four tape slings of equal length, attached to the holes in the hinge brackets, should be used for helicopter winching and any horizontal raising / lowering operations. For vertical lowers, attach the ropes, using karabiners, to the holes in the head end hinge brackets.

6. The transport wheel can be carried detached from its frame to the accident scene. Ensure that the securing wing nuts are not loose. The wheel should be fitted when required, with the patient already on the stretcher. Lower the stretcher onto the frame and tighten the hook bolts, first locating the hook into the countersunk holes on the runners.
Rescue and Medical Quick Stretcher

This lightweight, inexpensive stretcher offers casualty support and minimises casualty handling. The casualty once placed in this device, need not be taken out again until in hospital, and can even remain in the stretcher whilst being X-rayed. The diagrams above show the Quick Stretcher, in the unrolled and ready for use position, **Fig 31a** and with a casualty loaded and secured, ready for carrying, **Fig 31b**.

With a weight of under 4 kg and measuring just 66 cm x 21 cm when rolled up, the Quick Stretcher is easily carried by one man and can be rapidly deployed to an incident by a fast party while the main stretcher team follow behind.

The Quick Stretcher can be used in conjunction with a Bell and will give added support to any stretcher with a dubious bed. It is not designed to replace the conventional mountain stretcher and should be regarded more as a part of the casualty evacuation “system” than as an end in itself. Due to the limited protection given to the casualty’s back, it is not suited for dragging or transporting casualties over rock terrain or for long distances. It should not be used for casualties with pelvic injuries and has only a limited scope for crag rescues. Used with the Bell stretcher however, it will keep casualty handling to a minimum and thereby reduces the risk of increased patient trauma.

If does offer a lightweight evacuation alternative however, and is particularly suited to the transport of person suffering relatively minor injuries over easy ground, and for the recovery of bodies, where the full protection provided by a conventional “full weight” mountain stretcher is not required.
SAR HELICOPTER STRETCHERS

The Neil Robertson Stretcher

This stretcher has no frame but is a canvas roll stiffened by lengths of ash. It is the stretcher used primarily on all SAR helicopters, having been modified by the addition of a rigid back and head support. It is also used for pot-hole rescues where its minimum bulk has an advantage.

The Stokes Litter

The Stokes Litter is an American designed stretcher and is currently carried by SAR Sea King helicopters.

The Scoop Stretcher

This stretcher is designed to ease the removal of a casualty when conditions require movement in the position found. The stretcher can be separated into 2 halves to allow the casualty to be “scooped up” with minimal disturbance. The stretcher cannot be used on its own for winching, but can be secured in the Neil Robertson for this operation to take place. Scoop stretchers are currently carried by 819 Sqn (Gannet) Navy Sea Kings.