Introduction
This document details Pre and Post use inspection, routine maintenance and repair.

Fast Rope Description
Innovators in the field of rope technology, Marlow Ropes designed and developed the original Fast Rope in conjunction with the British Special Forces. These ropes are now in use by traditional Special Forces and SWAT teams across the globe.
The 40mm nominal diameter and unique construction of this rope allows comfortable control throughout decent without the need for harnesses.

Standard Use
Fast Ropes are designed to allow up to 3 personnel at a time including personal equipment (150kg each) to quickly and safely descend from a hovering aircraft. The technique uses friction breaking with the hands and feet.

Technical Data

Fast Rope	
Material	Staple nylon 6 melt spun olive drab
Base Yarn Size	6500 Denier
Base Yarn Twist	140 +/- 14 twists per metre
Yarns Per Strand	19
Rope Construction	4 pairs of strands formed into 8 strand plait
Rope Diameter	40mm (nominal)
Minimum Break Load	7,600 kgs
Average Break Load	11,000 kgs
Weight	940g / m when measured at zero tension
Shelf Life	10 years
Service Life	4 years
Maximum life from date of manufacture	10 years

Shelf Life
The maximum shelf life from date of manufacture is 10 years. The rope should be stored before first use in the original sealed packaging. If the rope is removed from its original packaging this date should be logged as the beginning of its service life.
After 10 years has expired the rope should be removed from service and destroyed beyond use or repair irrelevant of the appearance.

Service Life
Fast ropes have a service life of 4 years. The service life should not be ignored and ropes that reach this date should be retired regardless of the condition of the rope. The service life should be adhered to only if proper use, care and maintenance is performed. Any deviation from this will lessen the service life to varying extents.

Storage
Fast ropes should be ideally stored in in a dry room, out of direct sunlight and not at extreme temperatures.

- Ropes should be stored in a clean place free from dust and other foreign matter that could result in ingress of small particles which can cause inter yarn abrasion leading to strength reduction.
- Ropes should be stored away from direct sunlight. Continued exposure to Ultra-Violet light will cause a reduction of strength in Nylon over an extended period.
- High levels of humidity will have 2 negative effects. 1. A strength reduction of up to 15%. 2. The rope can shrink which reduces its flexibility making it difficult to use in operation.
- To ensure the rope isn't affected by extreme temperature the rope should be stored in ambient temperatures between -10°C and +30°C.

Temporary Storage
Temporary storage on board helicopters and other transport is often less than ideal. The storage on board helicopters should mimic normal storage as close as possible. The time spent stored in helicopters should be kept to a minimum. Any adverse effects caused by improper storage will decrease the service life of the rope.

Pre Use
Before first use:

- The rope should have an initial inspection.
- The rope details, inspection dates, issues, maintenance, service life and expiry should be logged.
- The service life should be placed on the rope where possible for quick reference.

Before every use:

- Check that the fast rope has not exceeded its service life. If the service life has expired the rope should be removed from service.
- Examine the rope to ensure the rope remains flexible. The plaits in the rope should deform with tension and return to the original straight when relaxed.
- Check the entire length of the rope in sections for excessive marks of abrasion and cuts from foreign objects.
- Visually examine all strands to ensure no strand loops have developed.
- Check for dirt, oil and chemicals on the outside of the rope. Clean where necessary.

Post Use
Check that the fast rope has not exceeded its service life. If the service life has expired the rope should be removed from service.
Fast ropes should be inspected after each use for dirt or other foreign materials.

Cleaning: Cleaning the fast rope should be kept to a minimum and only performed when necessary. Cleaning methods should correspond with the material to be cleaned. Dust and dirt can be removed of with a soft

brush. Oil and Greece can often be spot cleaned with warm water and a detergent.
Salt Water: If the fast rope has come into contact with salt water the rope must be rinsed thoroughly by hand in large quantities of fresh water within 24 hours.
Drying: Fast ropes that are wet or damp must be air dried thoroughly before storage. This should be done by either hanging the rope from the attachment point or draping the rope above the floor over objects.

Examine the rope to ensure the rope remains flexible. The plaits in the rope should deform with tension and return to the original straight when relaxed.
Check the entire length of the rope in sections for excessive marks of abrasion and cuts from foreign objects.
Visually examine all strands to ensure no strand loops have developed.
Check for dirt, oil and chemicals on the outside of the rope. Clean where necessary.

Minor Damage occurrence and repair.

Dirt, Oil and Chemicals.

Picture 1: Muddy Rope should be cleaned.

Issue - Dirt, Oil or Chemical marks. Should be removed buy washing fresh water and light detergent.

Hooked Yarns.

Picture 2: Hooked Yarn under 25mm

Issue – Hooked yarn (loop) under 25mm in length
Repair – Using a small blunt nose fid all loops should be worked back into the rope. Sharp noised instruments shouldn't be used as they will cause further damage. Rope should be rechecked to ensure no further distortion from the pulled yarn.
Issue – Hooked yarn (loop) over 25mm in length
Repair – cut the loop and work the ends back into the strand using a small blunt nose fid. Sharp noised instruments shouldn't be used as they will cause further damage. Rope should be rechecked to ensure no further distortion from the pulled yarn. Up to and including 10 loops per rope may be repaired in this way.

End Whipping damaged or missing.

Picture 3: End whipping damaged and must be replaced.

Issue – End of the rope is heat sealed but whipping is damaged or missing.
Repair - Rewhip the end of the rope using 3mm Marlow 8 Plait Standard Black to a length of 150mm. Ensure the rope end is still heat sealed and not cracked.

Fluffing and Glazed sections.

Picture 4: Normal wear from descents.

Issue – Outer surface of the rope fibres become frayed. This causes a fluffed fuzzy surface on the rope. This is quite normal and the condition should stabilise.

Glazing causes the outer surface of the rope to become smooth. This is caused by excessive heat build-up and melting of the outer fibres. This should not affect more than 100mm and should only be 0.5mm thick.
Repair – There is no repair and sections should not be more than 1 x 100mm section within a 5m section of the fast rope.

Major Damage
Any issues that are found in this section, the rope should be removed from service and destroyed beyond repair.

- Manufacturer sticker or logbook missing.
- More than 10 hooked Yarns over 25mm height.
- Dirt, Oil or Chemicals which cannot be washed off.
- Excessive Fraying causing a significant reduction in load bearing fibres.

Picture 5: Excessive wear on the rope and should be withdrawn from service.

- Cut sections of yarn.
- Rope diameter decrease and does not recoil after loading.
- Glazing over sections of more than 100mm.
- Heat Sealed End Cracked or missing.

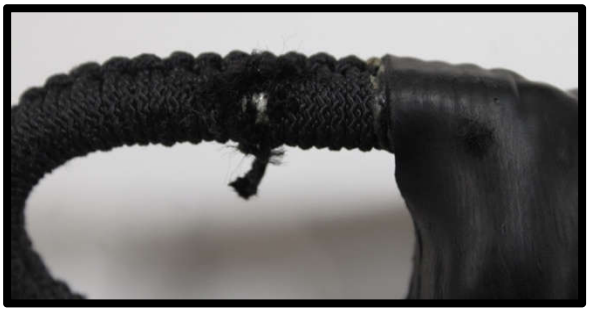
DLT termination
This rope termination is constructed from two independent loops of high strength dyneema cord. This means that there is sufficient redundancy in the termination that it will hold the working load of the rope even with a full braid severed.

Picture 6: Cut strand on DLT termination.

Any more than one strand of the HMPE braid cut completely through will require the rope be retired or re-terminated.

Picture 7: Surface abrasion of DLT termination.

Abrasion that results in a complete strand being severed will require the rope be retired or re-terminated.



Picture 8: cut strand in eye protection

The load bearing loop in the end of the rope is protected by a polyester textile wrap. If this is damaged so that the contrasting colour HMPE is visible this should be repaired or the termination retired. Repair can be done by removing the damaged braid and re-applying this should only be done by a competent person.

Heavy Weight Fast Rope
Certain Helicopter types may require additional weight in the rope for correct deployment. The heavy weight fast rope meets this requirement through the addition of a string of beaded lead contained within the strands of the rope. This string is contained within a braid that forms the core of the strand.

In addition to the normal inspection criteria there is the possibility of this lead becoming visible at the surface of the rope.

This can be repaired by either manipulating the lead back into the strand or in the case of a loop cutting the white polyester string at the point where it exits the inner braid.

FRIES rope

The fries rope has additional spliced in loops at the lower end of the FAST rope for extracting personnel and equipment. These loops are made from 8 strand nylon and have an abrasion resistant PU impregnation.
The minimum strength of these loop is 1.5 tonnes.

Picture 10: FRIES extraction loop pair.

Picture 11: Normal surface abrasion on extraction loop.

Picture 12: Severe wear of extraction loop.

If the extraction loops becomes worn such that the strands of the rope are not easily distinguished as shown in picture 12 then the loop must be retired and cut from the main rope to prevent use.

Picture 13: Cut strand in FRIES loop.

If one or more strands of the extraction loop are cut then the loop must be retired and cut from the main rope to prevent use.