

Helmets for Flying, Firefighting and Military Applications



For well over half a century Helmets Limited has been designing and manufacturing a wide variety of protective headwear.

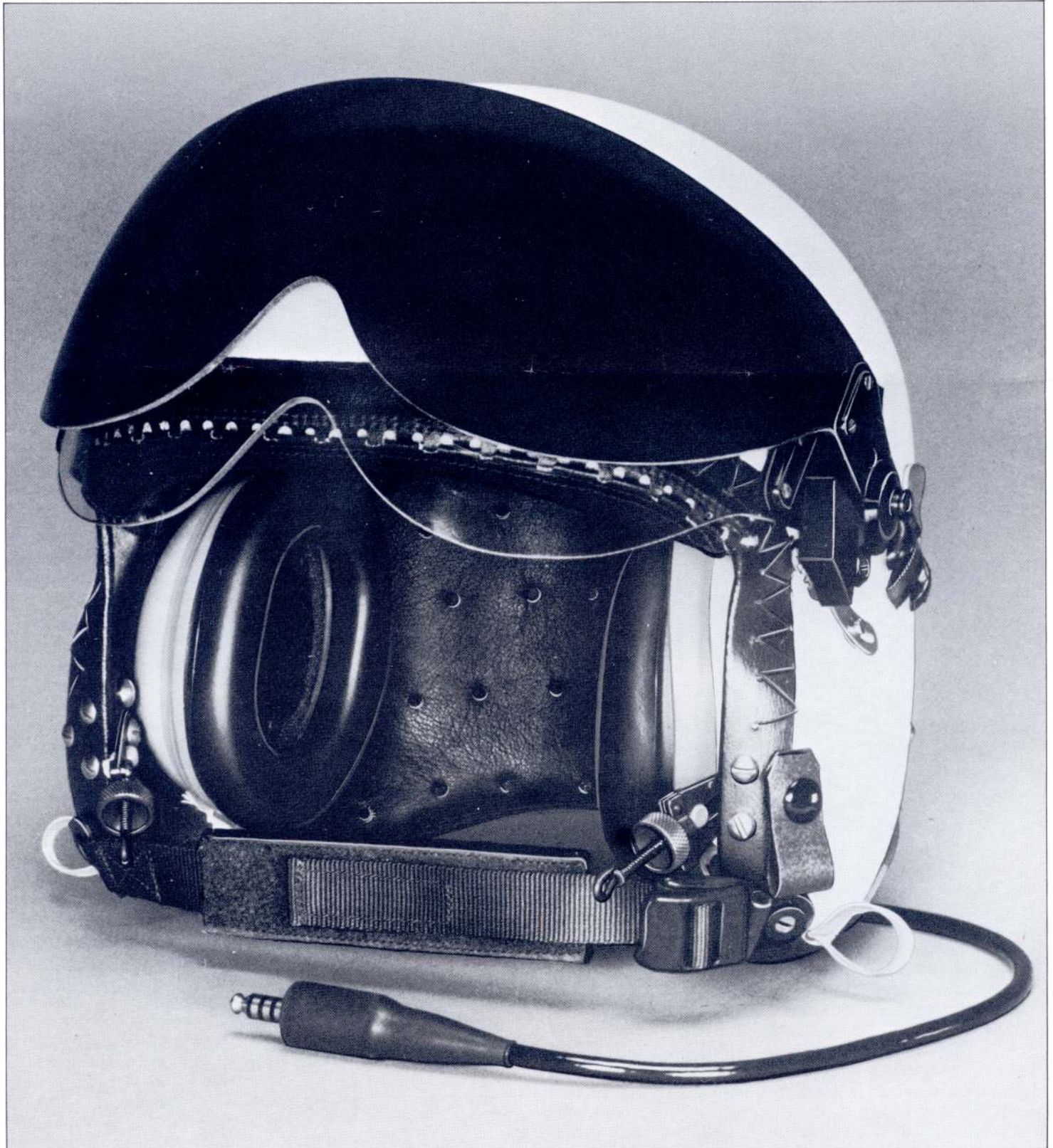
All the helmets described here are the result of this unique experience. Each one has been tested and proven in use with the British Ministry of Defence and in many other parts of the world under all kinds of conditions.

Mk 4A Flying Helmet

This aircrew helmet is capable of providing a high level of protection against impact shock, blast and noise. It is compatible with a wide range of oxygen masks and ancillary equipment and can be used in a variety of aircraft types whilst providing the maximum comfort to the wearer.

General Construction

The shell of this helmet is made from aircraft quality, satin weave fibreglass impregnated with polyester resin. It is laminated by hand, under rigorously controlled conditions. The helmet is lined with shock-absorbing expanded polystyrene and fitted with an adjustable webbing cradle encompassing both the head and neck.

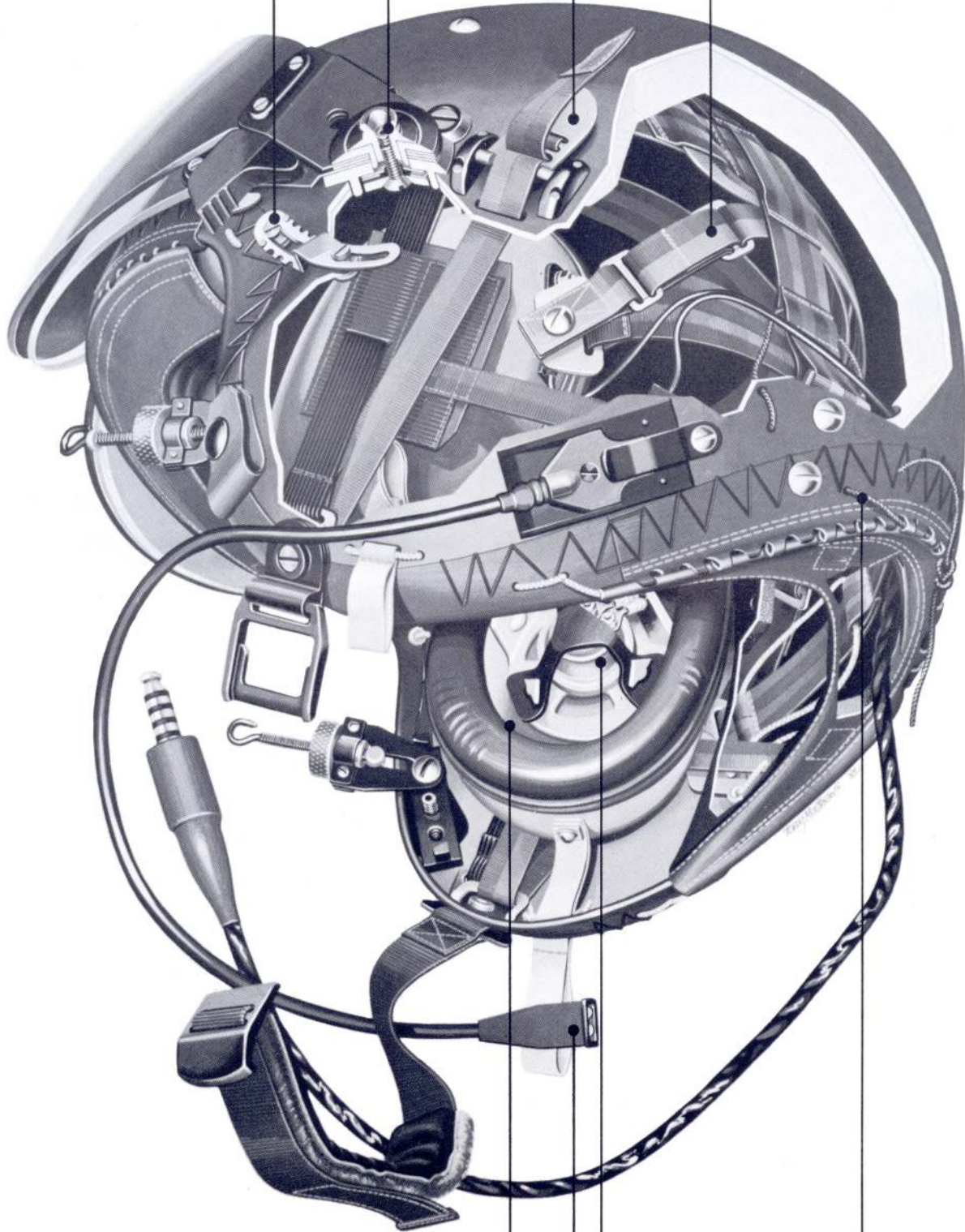


1 Friction controlled visor hinges

2 Adjustable clear visor lock plate

3 Headset tensing straps and buckles

4 Rear cross webbing buckles



5 Noise suppressing capsules and PVC seals

6 Oxygen mask microphone connector

7 Fore and aft diagonal webbing cord

8 Miniature receivers

For extra comfort the helmet is fitted with leather-covered urethane foam pads. It also carries a noise-excluding electrical headset with adjustable ear capsules.

Two injection moulded polycarbonate visors, side mounted on common pivots, offer protection against glare and blast.

The helmet has complete provision for microphone/telephone connectors and attachment of an oxygen mask if required.

Impact Protection

Especially designed to achieve a very high level of impact resistance, the helmet will withstand a blow of 20.4 kgf m (203 Joules) with less than 19.6 kN transmitted force. The Mk 4A has also been tested for its resistance to penetration by sharp objects by dropping a pointed steel striker, weighing 3kgs onto the crown of the helmet from a height of 3m.

These tests are carried out routinely on models from the production line.

Blast Protection

In blast protection tests using dummies, the Mk 4A was wind tunnel tested to 1280km/h and rocket-sled tested in trial ejections to 1220km/h. The helmets and blast visors remained in place in both cases.

Bird Strike/canopy Debris

Further tests, measuring the impact strength of the polycarbonate visors, ensure face and eye protection against bird strike or canopy debris. These trials demonstrate that the visors will withstand – without breakage or rupture – a perspex bullet weighing 20gm fired at a speed of 150m/sec.

Communications/Noise Protection

The helmet has two ear capsules which are fitted with single miniature transducers giving excellent frequency response and powered to match the volume of the ear capsule without distortion.

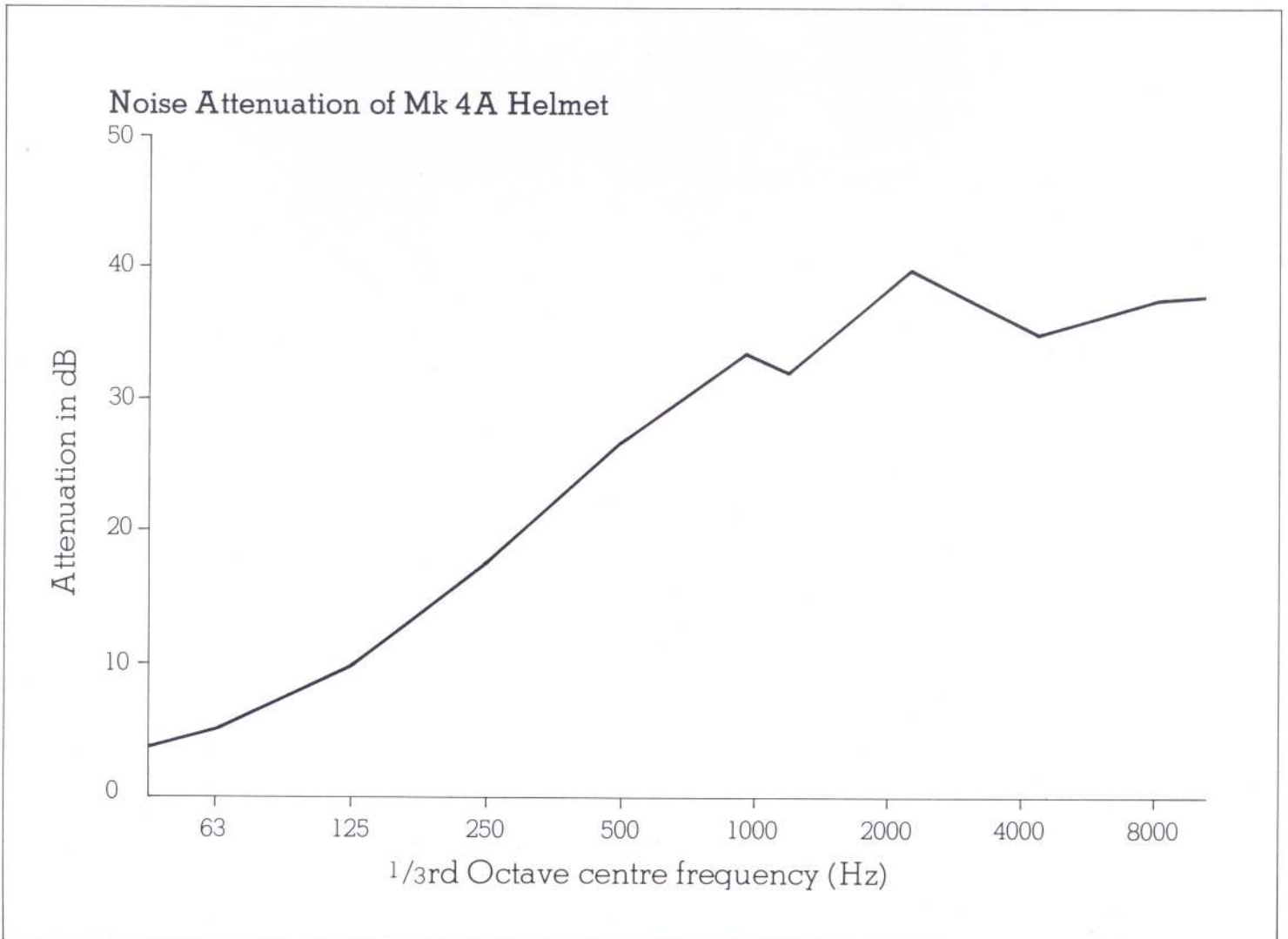
The specially designed ear capsules are filled with a noise-excluding wadding. This construction effectively reduces annoying and potentially harmful background noise. (See graph below.)

Comfort and Fit

To achieve the best possible fit the helmet is supplied in five basic sizes. These sizes utilise the length and breadth of the head as key dimensions and consequently offer a better fit than can be obtained by using the traditional method of measuring head circumference. Once the correct size has been selected for a crew member a series of adjustments is made to the cradle, visor and mask hooks to obtain a custom fit.

In high 'g' situations the weight of the helmet becomes a factor in aircrew fatigue and any weight saving is very important. The table below shows the standard Mk 4A sizes, key dimensions and approximate weights.

Basic Size	Length mm	Breadth mm	Approx Weight kg
Small	180 to 199	142 to 159	1.75
Medium	180 to 205	142 to 164	1.8
Medium/Long	199 to 218	142 to 164	1.9
Medium/Broad	180 to 205	159 to 175	1.9
Large	199 to 218	159 to 175	1.9





Mk 3C Flying Helmet

This aircraft helmet is suitable for use in a variety of aircraft types and is the predecessor to the Mk 4A helmet. The shell of the helmet is manufactured from glassfibre woven cloth impregnated with polyester resin and lined with a shock absorbing layer of cork and an internal webbing cradle. The soft comfortably padded lining is replaceable and together with the chinstraps, visors and oxygen mask, offers blast protection to 650 km/h.

A single miniature telephone is recessed to the rear of the helmet and feeds the signal via sound tubes to acoustically designed ear capsules fitted with foam seals.

The helmet is fitted with a dual visor system comprising two optically clear injection moulded polycarbonate visors. The inner, clear visor offers protection against blast and bird strike debris and has an adjustable lock. The outer is tinted for glare protection.

The helmet will resist a blow of 20.4 kgf m with less than 19.6 kN transmitted force. It is supplied in four basic sizes and a series of adjustments can be made to obtain a custom fit. Average weight of the helmet complete is approximately 1.9 kgs.



Mk 3E Helmet

This helmet was designed to meet a requirement for a helmet for helicopters and other aircraft not equipped with ejection seats. It carries a single tinted visor made from optically clear injection-moulded polycarbonate which is side mounted and friction controlled to prevent inadvertent lowering. The visor is designed in such a way as to prevent snagging of winch cables etc. The helmet can be fitted with a microphone on a boom and rail for correct positioning in front of the mouth, or with hooks for the attachment of an oxygen mask.

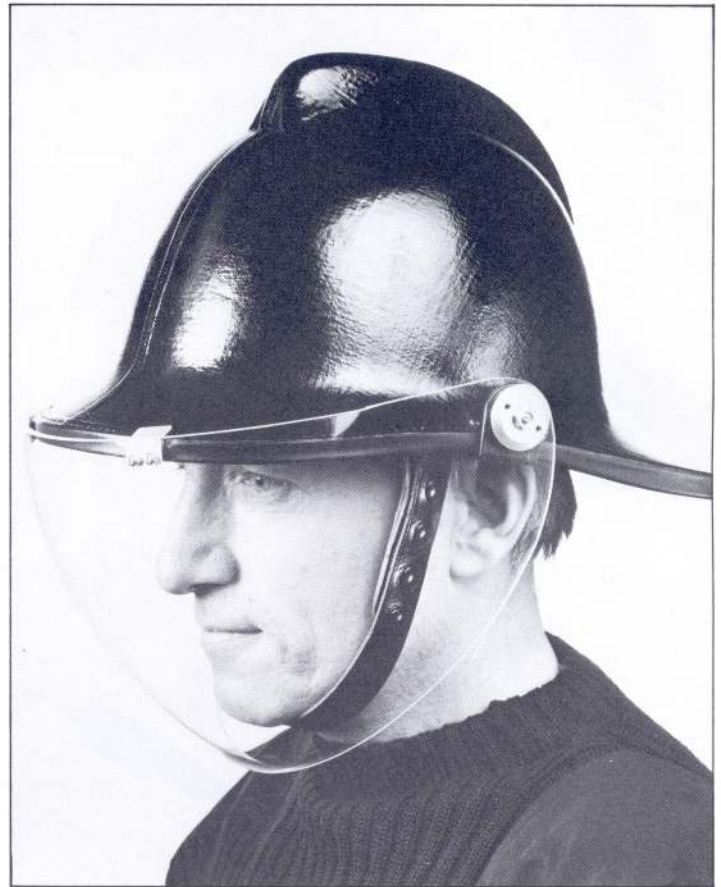
The helmet meets the same basic specification as the Mk 3C helmet and is available in four sizes. Average weight of the helmet is 1.75 kgs.



F135 Firemens Helmet

This helmet has a thick outer shell moulded from cork granules, combined with an A.B.S. plastic inner shell, which together provide high impact protection. The outer surface is covered with cotton drill and finished in high gloss polyurethane, available in black, white or yellow. Rivetted to the inner shell is a nylon webbing cradle set at the minimum recommended clearance. A tongued leathercloth lining, securely sewn to a polythene headband, is clipped into the inner shell. This lining, which is replaceable, is fitted with a nylon drawlace for adjustment to suit individual comfort.

Design specification ensures that the F135 exceeds all tests required in British Standard 3864. Cromwell Firemen's helmets are electrically insulated to withstand at least 2000 volts with a maximum conductivity through the structure of 3 milli-amperes. The helmets have been exposed to rigorous flame tests and will also withstand radiant heat in excess of 180°F (82°C) for a minimum of ten minutes. Impact protection to over 16.59 kgf m at the crown is provided. Average weight is approximately 2.2lb (1 kg). The helmet is available in 10 sizes



F200 Airfield Firefighting Helmet

Adapted from the standard British Fireman's helmet, the F200 has a visor for airfield and other applications where breathing apparatus is not used but heat protection for the face and neck is required.

The thick outer shell moulded from cork granules, combined with an A.B.S. plastic inner shell, together provide high impact protection. The outer surface is covered with cotton drill and finished in high gloss polyurethane, available in black, white or yellow. Rivetted to the inner shell is a nylon webbing cradle set at the minimum recommended clearance. A tongued leathercloth lining, securely sewn to a polythene headband, is clipped into the inner shell. This lining, which is replaceable, is fitted with a nylon drawlace for adjustment to suit individual comfort.

The 5mm acrylic visor is hinged on two side friction pivots which are themselves attached to the shell by brackets. These brackets are nylon coated to prevent electrical contact between helmet and wearer.

With its thick outer shell, A.B.S. plastic inner shell and webbing cradle, this helmet will withstand three consecutive blows of 16.59kgf m (162 Joules) at the crown with less than 17.8 kN transmitted force.

The helmet itself is electrically insulated to withstand at least 2000 volts with maximum conductivity through the structure of 3 milli-amperes.

The helmet has been exposed to rigorous flame tests and will also withstand radiant heat in excess of 82°C (180°F) for a minimum of ten minutes.

Average weight is approximately 1.3 kg and the helmet is available in ten sizes covering head sizes from 53 to 62 cms inclusive.



Mk 3 Fire Crash Tender Crew Helmet

The Mk 3 helmet has been designed specifically for airfield and other high-risk fire fighting applications where complete protection is required.

When the helmet is worn in conjunction with the appropriate clothing, petrol fires can be fought from close proximity.

The helmet is available in a single size and can be adjusted to fit head sizes from 52 cms to 62 cms inclusive. The adjustable polythene headband is fitted with a soft natural leather sweatband for improved wearer comfort.

The helmet shell is manufactured from glassfibre impregnated with a special fire retarding resin and finished in a self colour scratch and solvent resistant polyester gel. The shell, together with the flexible PVC coated webbing cradle, will withstand a blow of 5 kgf m (49 Joules) with less than 100 g peak deceleration.

An aluminised glassfibre and wool cape, which covers neck, chest and shoulders, is fitted to the rim of the helmet. The cape is replaceable.

The visor, which offers exceptionally good field of view and heat resistance is an Acrylic/Wire Gauze/Acrylic sandwich, bonded together to prevent penetration of water between layers and mounted in a light alloy frame. It is hinged on side pivots which are friction damped, allowing the visor to be worn in any position. It can be quickly and easily replaced and is easily opened with the finger and thumb of one gloved hand.

Weight of the helmet, with visor and neck curtain, is approximately 1.8 kg.



Anti-Riot Helmet

This helmet was developed for the British armed forces, and is used by anti-personnel units in areas of civil disturbance all over the world.

The shell is hand laminated from a special glassfibre impregnated with polyester resin. At the crown the helmet is lined with a high hysteresis, closed cell, expanded polystyrene covered with soft comfort padding. At the cheeks a semi flexible foam pad is held in position by the chinstrap.

The helmet is equipped with a shatterproof 3 mm polycarbonate visor which covers the face and neck regions. This is bolted to an alloy bar which swivels on two side pivots, allowing the visor to be worn in either the up or down position. The visor is replaceable.

The helmet will resist a blow of 16.59 kgf m with less than 19.6 kN transmitted force and practical experience in areas of civil disturbance has demonstrated that the helmet offers adequate protection against various types of hand-thrown missiles as well as indirect hits from the types of firearms most usually encountered in the riot situation, such as low velocity weapons and shotguns.

At only 1.5 kgs, the helmet is extremely light in weight and can be worn for long periods without discomfort. It is available in four sizes covering head sizes from 53 to 61 cms inclusive.



Parachute Instructor's Helmet

This helmet was designed as a lightweight training helmet for use where a high level of impact protection is needed but where there is no requirement for ballistic resistance.

The shell is hand laminated from aircraft quality fibreglass impregnated with polyester resin and is cut away at ear level in order to afford maximum protection at minimum weight. The shell is lined with cork and semi flexible foam, and, combined with a webbing cradle set at the minimum recommended clearance, the helmet offers the same degree of protection as the Anti-Riot Helmet.

The lining, made from cotton for a high degree of comfort in hot climates, is attached to the edge of the shell by looped castellated strips which mate together and are secured by nylon cord. The lining is replaceable. The chinstrap is secured by a two part quick release moulded plastic buckle.

Both shell and lining have a completely smooth surface to eliminate the possibility of snagging by parachute cords.

The helmet can be worn with goggles and a range of colours are available. 11 sizes of helmet cover head sizes from 52 to 63 cms inclusive.



Mk 2A Despatch Rider's Helmet

This helmet was designed as a lightweight general purpose helmet, suitable for Military Despatch Riders or Police Motorcyclists.

The helmet comprises a shell of hand laminated aircraft quality fibreglass impregnated with polyester resin and lined with a high hysteresis, closed cell expanded polystyrene moulding for improved shock absorption.

The Mk 2A offers a high level of rigidity and penetration resistance and will withstand a blow of 12.5 kgf m (22 Joules) with less than 400 g peak deceleration.

The interior of the helmet is padded with urethane foam covered with brushed nylon allowing the helmet to be worn for long periods without discomfort. Design of the lining is such that spectacles can easily be worn.

The helmet is retained on the head by a terylene webbing chinstrap which is securely attached to the helmet shell at two points. The chinstrap runs comfortably along the side of the face and is fastened under the chin by means of 2 'D' rings.

The helmet is equipped with a 5 stud fixing for visors or can be worn with goggles. Average weight is approximately 1.1 kg and a range of colours are available. Four sizes of helmet cover head sizes from 53 to 61 cms inclusive.

HELMETS

Further information can be obtained from:—
Helmets Limited, Moat Factory, Wheathampstead,
St. Albans, Hertfordshire, England.
Tel: Wheathampstead (058283) 2221

The Manufacturer reserves the right to amend or
withdraw any item without prior notice

Cromwell

'Helmets Limited' is an approved Defence Contractor and has been assessed to Quality Assurance Defence Standard 05-24. Each individual part used in manufacture is inspected to ensure that the highest standard of materials and workmanship is maintained. Full destructive impact and other tests are carried out on a routine sampling basis to ensure continued compliance with the specification. To ensure a full inspection capability, one in every twelve of the company work force is engaged purely in Quality Control. The company maintains a fully equipped Research and Development Laboratory for the continued search for improvement in helmet designs.

This file was downloaded
from the RTFM Library.

Link: www.scottbouch.com/rftm

Please see site for usage terms,
and more aircraft documents.

