

# Information

A QUARTER of a century ago in a small California town a young car enthusiast was modifying his friends' vehicles and fabricating various parts. Then someone asked him to make a crash helmet.

The man was Roy Richter and the town was Bell. Since that first helmet design, the name Bell has grown to become accepted as the hallmark of the world's finest helmets.

Bell helmets are imported by Two Four Accessories at 52 Clapham Common, Southside, London SW4 9BU. Two Four expect to sell 20,000 of these glass fibre helmets this year to what they reckon to be a discerning sector of the motorcycle market.

Probably the best-known helmet is the Bell Star II full face at £69.95. Bell pioneered a revolution in crash helmet design when they introduced the first full face helmet in 1966. Crash helmet manufacturers everywhere followed their lead.

They followed through with the Bell Moto full face helmet for off-road riders. Five times world moto-cross champion Roger De Coster was involved in the design. The latest version is the Bell Moto III which at present can only legally be sold for off-road use. Bell are waiting for the British Standards Institute to test this

## BELL-

# why there's a ring of confidence

model in order for it to be openly sold for road use.

Two Four confidently expect to have BSI kitemark approval by mid-summer, in which case the Bell Moto III will go down in price because the value added tax will be dropped. Helmets sold for road use do not have VAT. The Moto III presently costs £58.50 plus £8.80 VAT.

Third and final member of the Bell family in Britain is the Magnum II at £57.95. This is gaining in popularity and some police forces are beginning to use it.

Bell helmets are warranted for two years and each stockist is equipped with a tape measure with Bell sizes to deal efficiently with customers. The helmets are available in three shell sizes and various liner sizes to fit most heads.

The Bell factory is now in Los Angeles and is part of the Wynn group. Bell's vice-president Ernest Jewell, an industrial engineer who has been with the company for three years was recently in London to attend a meeting of United Nations safety testing authorities.

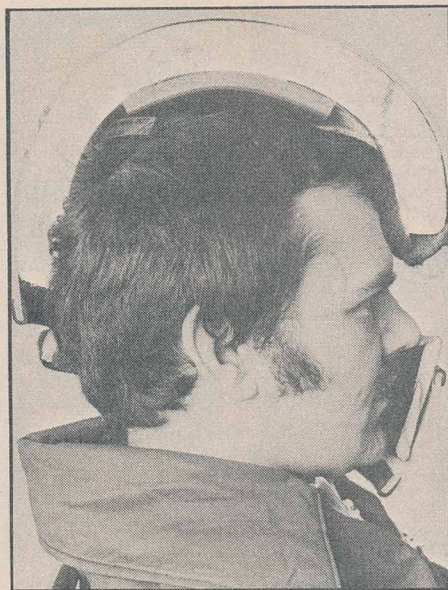
To take advantage of Mr Jewell's visit Two Four's managing director Eddie Leigh set up an exclusive interview for *Motorcycle Mechanics*. This is what Mr Jewell said:

'We have a saying at Bell — "If you have a ten dollar head wear a ten dollar helmet." We know Bell helmets are expensive but they are the best in the world. We have a reputation for quality.

MAY 1980



As it's said the discerning motorcyclist might have a preference for the Bell helmet, Brian Crichton finds out what makes them so special . . .



*Bell's glass fibre helmet is almost perfectly layered. The thick shock-layer is high density expanded polystyrene.*

Each helmet is hand-made. The laminators are all girls, some have been with the factory 15 years and each one signs every shell she makes.

In terms of protection the Bell Kenny Roberts wears is the same as you can buy over the counter. Only the cosmetics are different. He has the same shell and liner protection.

We have ten per cent of the U.S. market, but in terms of glass fibre we are the largest. Bell have only ever sold glass fibre helmets. We are testing all the time, but so far we have not come across anything to match it.

In an impact you must dissipate the energy. When you have something which is layered, such as glass fibre, the energy is consumed by the layers moving or separating. This principle of layering is important to *manage* energy.

If you take a solid material it will not spread energy. It allows it to remain concentrated. Materials such as polycarbonate and ABS are tough but toughness is not what you are after.

Plastics are a chemical material. In their manufacture you have the recipe and the forming.

If you get both stages right you can

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produce a helmet which will give a *ductile* break — an energy-absorbing break by stretching like toffee.

If you get something wrong in one of the stages the break will be *catastrophic*, like glass.

For example, if you do not control the molecular weight of the plastic correctly in the mechanical process of forming you can introduce catastrophic break characteristics easily. The same applies if you cool the material too slowly.

Then there is the use stage. If you use certain types of stickers or paint which are not compatible you can introduce a catastrophic rather than a ductile break. If you have a scratch line it can cause a polycarbonate helmet to fail catastrophically on impact.

Let me tell you a story.

A woman buys a vacuum cleaner and breaks the plastic top. She takes it back to the shop and asks the salesman what to do.

— Buy a new top.

Her husband is in a motor bike crash and his plastic helmet is shattered. She takes it back to the shop and asks the salesman what to do.

— Find a new husband.

We have chosen glass fibre. It has great tensile strength, you can paint it and it bonds extremely well. Kevlar, the fibre material used in bullet-proof vests has great tensile strength, but you can't bond it

very well.

We have developed our own flexible resin for bonding which allows movement between the glass fibre layers for additional management of energy.

Glass fibre helmets are costly to produce. We are constantly looking for an injection moulding method which is as good for head protection as glass fibre so that production costs can be reduced.

So far we haven't found one. We think that if you choose polycarbonate you are assuming a certain level of risk. The evidence doesn't stack up. You don't know which one is going to fail.

Glass fibre won't fail catastrophically as easily and in the same fashion as polycarbonate. It won't break into pieces. It tears and as it does so it absorbs a tremendous amount of energy. After all it's what happens to the head that's important, not what happens to the helmet. The more protection you can get by absorbing energy the better.

The majority of impacts according to statistics are in the forehead area at the 11, 12 and one o'clock positions.

Bell helmets imported in Britain have seven layers of glass fibre over the dome and five at the sides.

When you buy a helmet make darn sure it fits. Don't take two impacts . . . one between the helmet and the road, and one between the head and the helmet. Err

slightly on the small side.

Take a good look at the chin strap. If it's rivetted to the shell through the fabric you begin to ask questions.

Bell helmets have a metal plate rivetted to the shell. The chin strap fixes to the metal plate. A chin strap fixing cannot be strong enough.

D-ring fastenings to do the chin strap up are best. Some of the roller types are quite good, but the D-rings are the best of all.

Try the helmet on and do the chin strap up, then try to jerk the helmet off by pulling it from the back. If it comes off don't buy it.

With regard to visors the search is on. We have tried all kinds of materials. At present we fit acetate visors because they do not scratch as easily as polycarbonate, but they are not as strong.

The Star, Magnum and Moto pass the American Snell '75 test which is the world's most rigid. The BSI 2495 is the next best test. The main difference between the two is that Snell involves higher energies.

We have never tried to build to a standard. We set our own. We build to a much higher level. Kerbs and trees don't make exceptions for anyone. You need as much protection as you can get.

**Right: Road racing maestro Kenny Roberts has long been a Bell helmet man.**

## Win yourself a super helmet — free

NOW YOU'VE read how much research and planning has gone into perfecting what many regard as the finest helmet available, how would you like to win one of the magnificent Bell Star II helmets? This special MCM contest is free-to-enter.

These are the type worn by 1978 and 1979 500cc road racing world champion Kenny Roberts who should know a good

thing when he sees one.

We are giving away six of these helmets to the first six correctly-answered postcards drawn out of the mailbag. All you have to do is to pick out eight differences between these two cartoons. The changes made are subtle but we can assure you there are at least eight!

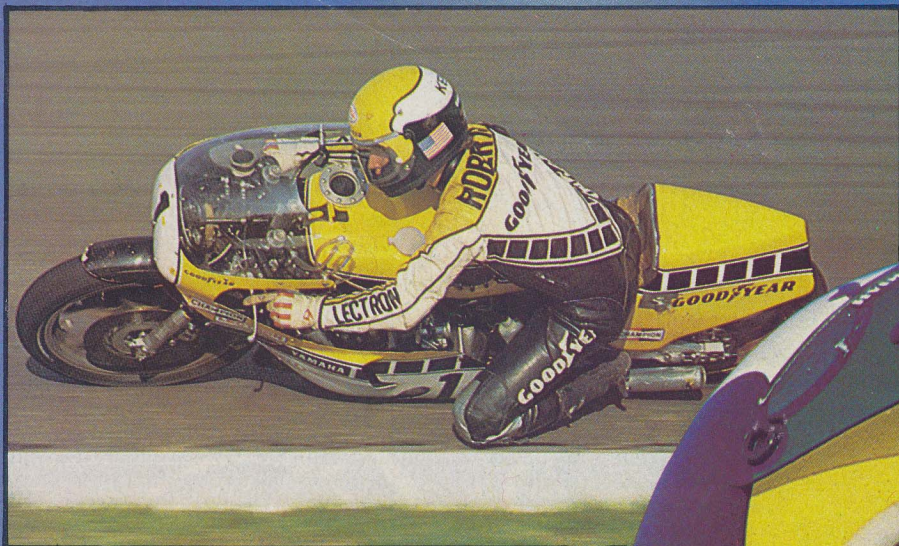
List the changes on a postcard, add your

full name and address and send it to 'Helmets Competition', Motorcycle Mechanics, Bretton Court, Bretton, Peterborough PE3 8DZ.

If you're one of the lucky winners, we will contact you to find out what size and colour your Bell Star should be.

So get cracking — all entries must be received by May 9th, 1980.





*motorcycle*  
**MECHANICS**

