

RESCUE

- HIGH-RISE FIRES ■ SUICIDE JUMPERS
- PYLON, MAST, CHIMNEY, BRIDGE RESCUE/SAFETY
- THEME PARK RIDE RESCUE/SAFETY
- ANIMAL RESCUE (ROOFS/TREES)



70ft RESCUE Bag

Origin:	USA
Cost:	\$8,500. / £4700. (inc fans)
Weight:	175lbs rolled up
Time to Deploy:	1 minute
Time to Inflate:	1 minute
Dimensions:	
Packed:	4' x 2'
Deployed:	15' x 20' x 9'

Height safety is big business these days, you can't reach for the top shelf without requiring a fall arrest lanyard and written risk assessment. So it's extremely surprising to us that after years of risking our necks to take down suicide jumpers or training both for this and other hair-brained rescue scenarios we didn't cotton onto the classic hollywood firefighters' cliché of deploying a trampoline or an air bag to save folk falling from a great height.

We've been toying with the idea for years but didn't really know what we were supposed to buy. A trampoline held up by several firefighters seemed like madness but an airbag was surely viable. We had several important questions: how do we blow the thing up in the middle of nowhere?; would our jumper have jumped by the time we get the thing up?; what happens if the faller/jumper doesn't hit the middle of the bag?; how high a fall/jump could we reasonably protect? and what else could we use the bag for? Back to these questions later.

Our initial requirement was simple: we needed to ensure that an aggressive 'take-down' of a suicide jumper didn't end up with us helping him on his way to an untimely death. As an immensely useful bi-

product we'd also be able to protect any rescuer working at height in an exposed location whether it be a training scenario on the drill tower or an animal welfare officer trying to retrieve a cat on a hot slate roof. So we went to Hollywood.....literally!

One of Hollywood's finest stuntmen Scott Leva had already identified a problem with existing airbags - they had a nasty tendency to either 'bounce' folk off or collapse at the edges and provide nothing more than a very temporary delay in a nasty trip to the ground. This shouldn't be regarded as frivolity, these things really were (are) resulting in the deaths of stuntmen/women and the whole concept looked a bit flawed for us in rescue. The answer that our man in Hollywood [(unbe)known to you all for films such as Spiderman, Batman, Collateral, Superman, X-Men, Star Trek, RoboCop etc, etc,] was to invent a bag that would hold a falling body mass regardless of how off-centre the fall. It would also collapse so as to 'capture' the faller/jumper rather than bounce him/her off. This sounded ideal for rescue so we high-tailed it to Hollywood to have Scott initiate us into the fine art of falling!

Stunt jumping is a very precise skill and we quickly realised that a



AIRBAG

■ ROPE RESCUE TRAINING
 ■ HEIGHT SAFETY TRAINING ■ TACTICAL TRAINING
 ■ HEIGHT AWARENESS 'CONFIDENCE' AID
 ■ SPARE TIME STUNT WORK!

stuntman's unerring ability to fall flat onto an airbag regardless of his/her trajectory 20ft above the bag was of little use to a falling rescuer or jumper not at all interested or capable of adjusting their body position and approach to make for a safer landing. Because the simple fact is; if you hit an air bag head first from 70ft up it's going to have a similar affect to hitting the ground head-first from 10feet - probably death! and if you hit feet first from that height you could be looking forward to quadriplegia - if you weren't actually suicidal before hitting the bag you sure will be afterwards. But hang on, there may be a risk here in falling with poor posture but is the alternative of hitting solid ground any better? No of course it's not. We can only do the best we can and this bag represents the best we can do in a normal rescue environment. By happy coincidence it's harder to maintain a full feet-first or head-first orientation from 70ft than not so for the most part we'll accept that a bad impact into the bag might be, might be, a little more painful than expected but at least you'll live!!

CONSTRUCTION

The bag is constructed of 2mm vinyl with a slip-resistant top surface to assist in 'capturing' the impacting faller. In the case of the 70ft bag illustrated here it covers a whopping 20ft by 20ft by 9-10ft high arresting a falling adult from about 70ft. When packed it is about the size of a very, very large cornish pasty - 4ft by 2ft depending on how you pack it. It is powered by 2 AIRBOSS electric fan's 240 or 110v with three power settings. This variable power setting is an important feature because proper bag deployment isn't simply

a case of blowing it up and hoping for the best! More on this later. In design terms this bag introduced the concept of double compartments tied with kevlar restraints and quadruple baffling to enable a faller to hit the bag anywhere on it's top surface and not bounce off or have the edges collapse. Baffles on each end continually bleed air while the large side baffles vent huge volumes of air when the faller hits thus absorbing the impact and gathering him up safely. The electric fans can be run from mains or generators but in either case the 70ft fall bag takes about 1 minute to lay out and 1 minute to inflate. This surprises everybody that sees the bag. Having had the first faller hit the bag, re-inflation takes 10 to 20 seconds. As always you can buy airbags that are considerably cheaper than this but this really isn't an area to skimp on! Scott's design of air bag is based on his own requirement to live longer and with all his faculties intact so you know he's put his money where his mouth is and come up with the safest bag on the market.

IN ACTION

We've been training and conceptualising with air bags for a year and have a pretty good idea of the operational abilities and constraints. The first thing to realise is that there is a training implication but it is quickly learned because it's a simple operation and simple to use. Hopefully you won't be the one falling into this bag but it is important that those deploying the bag are aware of exactly how it feels to fall into the bag, how the wind has an effect, how high it seems, how alien it feels to fall flat on your back when you've spent your life trying to enter water with javelin-like style. So

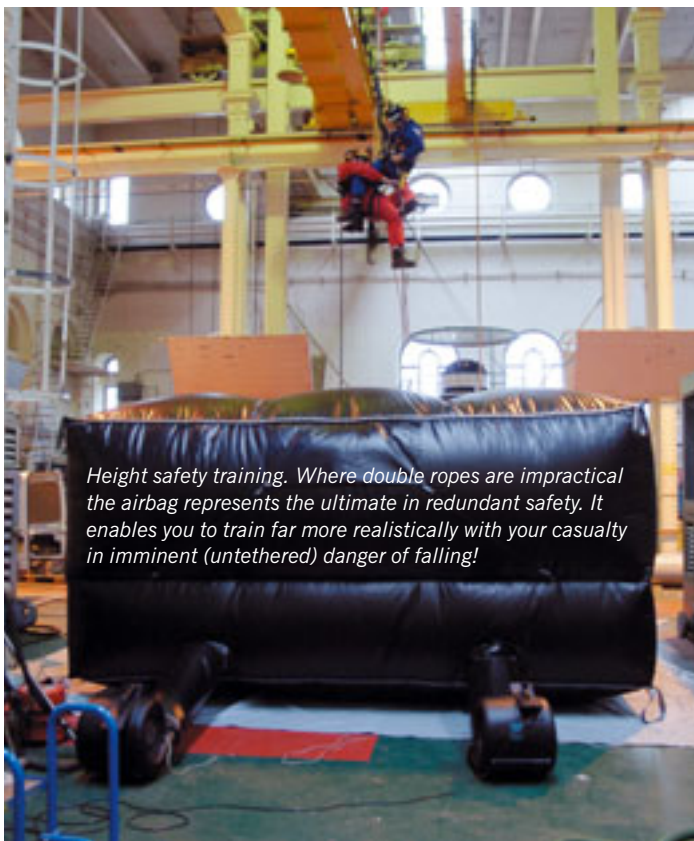
use the bag yourselves and figure out all the possibilities.

We've incorporated a heavy duty groundsheet into our bag and roll it up together for stowage. We also have a 4-wheeled trolley to ease movement of the bag on scene because it is heavy, requiring 2- persons to drag and 4 to lift. Once at the required location we stand the bag on end and lift the cover bag off like a sock. The bag is then unfolded - we quarter it - with the ground sheet on the bottom unrolling from the exposed fan vents (which also have to be on the bottom). The fans are connected to the vents flaps via velcro all round the fans wide exhaust ports. This entire process should take 2 people less than 2 minutes, generally closer to a minute. Next, the fans are plugged into mains sockets (with a breaker) or into the generator. In remote areas we use a small generator and start the fans in sequence from both-off to one-low and upwards to both high. This just ensures we don't overload the generator when it's trying to do the hardest work of inflating the 'vacuum' packed air bag. This process adds about 30 seconds to the deployment as compared to direct mains connection or connection to a more powerful larger





generator.
As the fans inflate folk on either side of the bag should help lift the top to speed up inflation and should also ensure that the baffles are in place and not bleeding out acres of air.
Once the bag is inflated the electric fans run continuously and



Height safety training. Where double ropes are impractical the airbag represents the ultimate in redundant safety. It enables you to train far more realistically with your casualty in imminent (untethered) danger of falling!



training to hit the bag in a prone posture similar to the photos right. experienced stuntmen can rotate several times in the air, be hurtling face down 20feet above the bag and still perform a last minute body roll to land on their back.

are set to accommodate the expected weight of faller - if the weight is high - 2 persons or a heavy person set them to high/high, if the faller is a child set to low/low and all settings in between for the various weight configurations. Even though the bag is compartmented it will inflate more or less uniformly on one fan because the compartments are linked.

Once the faller hits the bag the side baffles blow and exhaust a proportional amount of air providing a soft impact as well as stopping the trampoline effect associated with standard bags. The title shot shows the teenage son of a hollywood stuntman orienting in mid-air to hit the bag on his back. In this case the bag has a white marker panel for better identification at great height.

We opted to have no such panel on our bag because we felt it would alert a potential jumper too early of our intentions. This bag may look enormous but at night, viewed from a great height and on tarmac, grass or water it's remarkably invisible!! The stuntmen use a white marker because they are engineering their jump to look dramatic. In our rescue situations the ground crew around the bag can position it to best centre the falling jumper. The bag is manoeuvrable enough to be easily dragged several feet in either direction by two or four persons especially if someone moves the fans (rather than dragging them with the bag).

Hitting the bag results in a loud bang and for the faller a number of results - the fall should be like hitting a judo mat - the greatest area of body hitting the largest expanse of mat with the arms slapping down either side at more or less the same time as the persons behind hits the bag. If you mis-time, one or other arm may take more impact and you will certainly see the odd- grazed elbow as clothing rubs during impact. If the head is a little too far back you'll get a little bit of 'bounce' and accompanying whiplash - our trainees often had a stiff neck from early poor posture. In theory, because the bag tends to envelope the faller, if you hit feet-first the bag may 'fold' you up and damage the spine - this is a possibility but we had enough dismal attempts at



CORRECT POSTURE
It is important during

heights up to about 40ft to know that you're OK at lower heights. DON'T land on your head under any circumstances. When test jumping you will initially take a simple step off your platform into thin air - as you fall you will naturally assume a falling leaf posture but in short falls, because there is very little time to orient you are best advised to kick your legs up, put your arms out and raise your head slightly. Try not to over-rotate but it would obviously be better to over-rotate with feet down rather than head down. The pros can impart a twist using their shoulder and arms that will quickly turn the body in mid air. Try it when you get more confident!

Once the faller has hit the bag knock the

fans down to 'low' or 'off' so that you can get to the faller or he can get off the bag easily. Leaving it inflated means that lighter folk have to fall off the side of the bag! You don't have to aim for the centre of this design of bag - it's still preferable to aim for the centre but it won't matter to your safety assuming you don't miss the bag altogether. We have routinely trained with two bodyweights falling close to the edge of the bag and it has always retained the fallers inwards rather than collapse as other bags will. This tendency to collapse at the edge has claimed the life of more than one stunt person.

MANOEUVRING AT AN INCIDENT

The bag can be inflated inside a minute and placed adjacent to a building, directly beneath pylons and bridge spans. There are handles on the top and bottom edges at each corner and these can be used to slide the bag in any direction. If the ground conditions dictate that the ground-sheet needs to go too then sturdy handles will be required on that but manoeuvring a tarp with a bag on the top is nowhere near as easy as just sliding the bag over a larger tarp! Compensate for wind. If you're dealing with a jumper and have the opportunity to drop a small sandbag (under direct radio contact with the ground crew!) this will aid in assessing wind affect and whether you need to



Correct falling position-legs slightly elevated, arms ready to slap down and bottom hitting first



LARKIN RESCUE FRAME

Australian Patent 624496, US Patent 5,135,119,
European Patents 0 395 297, P690 12 875-08

- * Fits into most basket style stretchers
- * Weighs only 40 kilograms
- * Full size reach is 2.5 metres (Half size 1.2 metres)
- * Constructed of high tenacity Aluminium alloy
- * Safe working load of 400 kilograms

In any lowering or lifting job the top edge is likely to present problems. The most elegant and sophisticated solution is the Larkin Rescue Frame.

Designed and constructed to give rescue personnel the maximum versatility for the minimum weight and cost, it can be readily assembled by two operators in less than TEN Minutes.

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HIGH TENSILE STATIC ROPE

HIGH TENACITY 100% POLYESTER STATIC ROPE

- Super low elongation — less than 1% at 300 lbs
- The feel, handling, and knotability of dynamic rope
- Remains supple after extensive use
- Superior abrasion resistance
- Naturally dry fiber resists moisture
- Better UV and chemical resistance than nylon static ropes
- Low electrical conductivity
- Great compatibility with most rescue and safety equipment
- Offers better efficiency in mechanical advantage systems
- Best rope for highlines
- Certified to NFPA 1983, 2001 edition

Available in four models

- 3/8" MBS of 6350 lbs. Ideal for light use rescue, haul lines, anchors, and z-drag systems.
- 7/16" MBS of 7791 lbs. Durable, low stretch rope for rope access and mountain rescue
- 1/2" MBS over 9560 lbs! Low elongation makes it top choice for mainlines, haul systems and highline use.
- 5/8" MBS over 13,000 lbs. makes this our strongest rope. The perfect choice for tower construction, bridge work, industrial safety.

Photo by Reed Thorne, Ropes That Rescue



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The Technical Rope Specialists
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tel 207-885-0330 www.sterlingrope.com



The Airbag (black bag) takes up an incredibly small amount of space, in fact, the two electric fans take up just as much but aren't as malleable - the airbag could be stored in any configuration you like from a flat tarpaulin to a tight roll but you have to be able to deploy it quickly. The fans can be used with ducting for extremely effective con-space ventilation.



be prepared to move the bag sideways a little during the fall. Be aware though that the wind has to be very high and the fall height extreme to dramatically affect the trajectory of the faller.

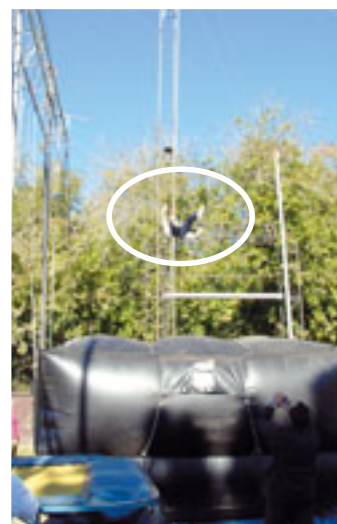
In the case of high-rise fires such a bag could provide the only lifeline for people trapped by fire and smoke and so desperate to avoid their fate they'd prefer to jump to their deaths. This bag gives you a chance - it's not foolproof but it's better than the ground. Be wary of pushing the height limits too much as the pressure of the situation will cause you to do - a 70ft Airbag is not a 100ft airbag - it may work - it may not! The bags are available for any height configuration you require and the smaller the fall height the smaller and lighter the bag.

CONCLUSIONS

We've become so convinced of the importance of this bag as a height safety aid that we'll be marketing it exclusively into the UK & Europe via the website.

The 70ft bag comes with either 110 or 240v Air Boss fans (x2) which double superbly as confined space rescue venting fans. We've had flat ducting manufactured to fit the fans and provide remote ventilation for confined space fresh air flushing. Operationally, we transport the entire airbag, generator, fans and associated rope rescue/access equipment in a twin-cab pickup but this could easily be podded or trailered if that's the way your agency works. It's not that big but it is surprisingly heavy!

This bag should see considerable operational action since it ought to be deployed for virtually every potential jumper, rope rescue and height safety incident. There's simply no reason not to deploy this degree of fall arrest protection at every height related incident and training session that doesn't require direct access to ground. It's more expensive than standard air bags but don't be fooled into thinking that cheaper is better - this is yet another area of rescue you cannot afford to skimp on!!



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Web: www.t-rescue.com

