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Alternative to Emergency Flares

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TECHNICAL MEMORANDUM

Submitted by
Sherwood Park RCMP

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NOTE: Further information about this report can be obtained by calling the CPRC information number (613) 998-6343

SUMMARY

Police have been looking for an alternative to the common flare because of the their following limitations:

- expensive,
- not considered environmentally safe,
- risky at chemical or gas spills,
- burn uniforms and equipment,
- generally difficult to use,
- fumes are offensive and noxious,
- very smokey,
- heavy to handle and store.

Mega Technical Industries, located in Alberta, have been developing and testing, with the assistance of the Royal Canadian Mounted Police, several products to be used in place of emergency flares.

These products were found to be cost effective, require little maintenance, have great visibility, and easy to use.

The two products, “LIFE-LIGHT” and “EMERGENCY STOBE” were deployed in six different scenarios.

1. “LIFE-LIGHT” strip arm band.

2. “LIFE-LIGHT” on safety traffic vest.

3. “LIFE-LIGHT” strips used on safety triangles.

4. “LIFE-LIGHT” on traffic cones.

5. “EMERGENCY STROBE”.

6. “EMERGENCY STROBE” in traffic cone.

ALTERNATIVE TO EMERGENCY FLARES

The Sherwood Park RCMP detachment started working with Mega Technical Industries (MTI), of Edmonton, Alberta, in the fall of 1990, on experimental "Life-Light" Strip Arm Bands. The initial units, powered by a 9 volt battery have five red strobes that flash in a sequence of two flashes per second. The arm band is held in place with velcro, which was also used to close the battery pouch (figure la). Many positive comments on these arm bands have been received while working at night Checkstops. It was noted in experiments conducted with an officer standing between two other officers with only reflective vests, that their visibility was limited unless there were strong headlights to illuminate the reflective vest, while the strobe lights made the wearer highly visible.

MTI developed the "Life-Light" Strip Arm Bands which are hermetically sealed in yellow reflexite material, with a sealed on /off switch. It is suggested these be worn as indicated in figure 1 b. The strip, powered as well by a 9-volt battery, functions for 48 to 60 hours, depending on the temperature. It has been tested down to minus 20 degrees centigrade and cost $14.00 each.

MTI also developed a Safety Traffic Vest with "Life-Lite" strips velcroed front and back as indicated in figure 2. Should the lights not function, you can still be seen by the Reflexite material (note the strips may be easily removed as the strips are attached with velcro. The "Life-Light" strips can also be attached to safety triangles (see figure 3) or on a traffic cone (see figure 4).

The Emergency Strobe (see figure 5), powered by a single "D" cell battery, is water-proof, having a hermetically sealed on/off switch. It is available with either a clear, amber, red or blue high impact plastic lens. The unit cost is $22.95. It can also be used underneath a traffic cone making it highly visible (see figure 6). It was suggested to the supplier that the strobe have a small magnet in the base in order that it could be placed on disabled vehicles at an accident scene. It's visible for 3 kilometres, flashing twice per second, having an average battery life of 16 hours. The unit when placed in a freezer for 4 hours at -20 degrees Centigrade was still flashing once every two seconds.

The high cost of flares used per annum is a major concern. A box of 72 flares cost $100.00. A flare burns for a period of between 15 to 20 minutes at a cost of a $1.38 each (in one hour three flares would cost $4.14).

The “Life-Light” strips emit .7 candela of light. They have an average life of 50 hours per battery, a battery ($2.40) and a unit price of $14.00 for the arm band, makes the total cost $16.60. Flares would cost $207.00 for the same period.

The “Emergency Strobe”, unit cost is $29.95, plus the cost of the "D" cell ($1.30). A 16-hour average life of a D cell translates into 666.24 to run the flares for the same period.

Some negative aspects of flares are that:

1. They are not environmentally safe.

2. They pose an extreme hazard at oil gas spills.

3. They can damage/burn uniforms and equipment.

4. Their spike remnants must be picked up after every burn.

5. The striker and cap must be disposed of after use.

6. They are difficult to extinguish after each burn.

7. Their fumes are offensive and noxious.

8. A case of flares is heavy to handle and hard to store.

9. Their brilliance at night is a hazard to passing motorists often distracting on-coming drivers,

ALTERNATIVE TO EMERGENCY FLARES - OPERATIONAL EVALUATION

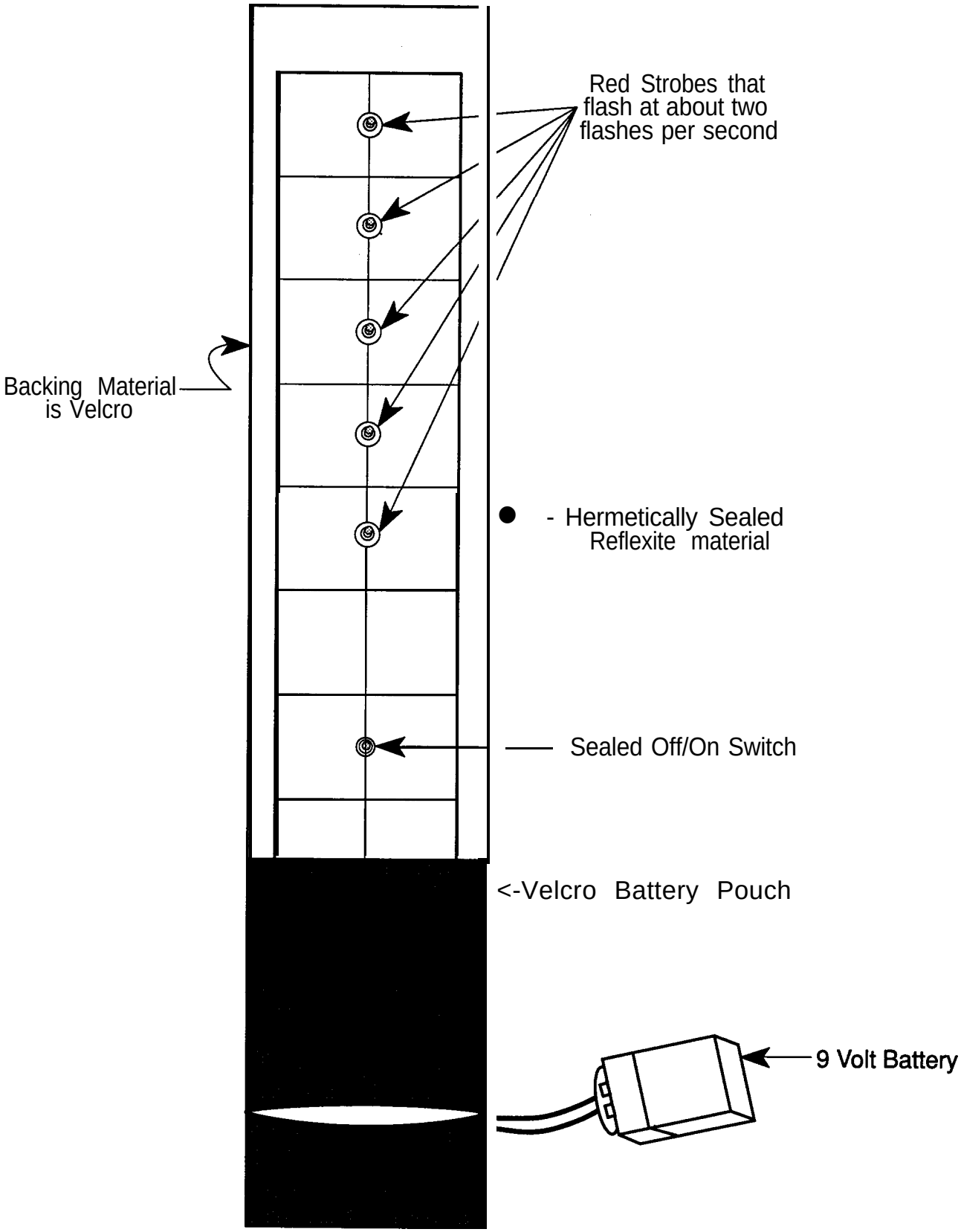
In the Fall of 1991, fifteen vehicles at Sherwood Park were equipped with four “Emergency Strobes”, two vests with four “Life-Lights” attached and four “Life-Lights” to place on cones for use in emergency situations. These were housed in plastic containers with lids.

The units have been in operation for ten months. One of the “Emergency Strobes” was destroyed when a semi trailer came out of the fog at an accident scene, lost control and ran over the cone. Another strobe stopped working after being dropped, it was repaired and placed back in service. To date, no battery replacement has been necessary and no other units have malfunctioned.

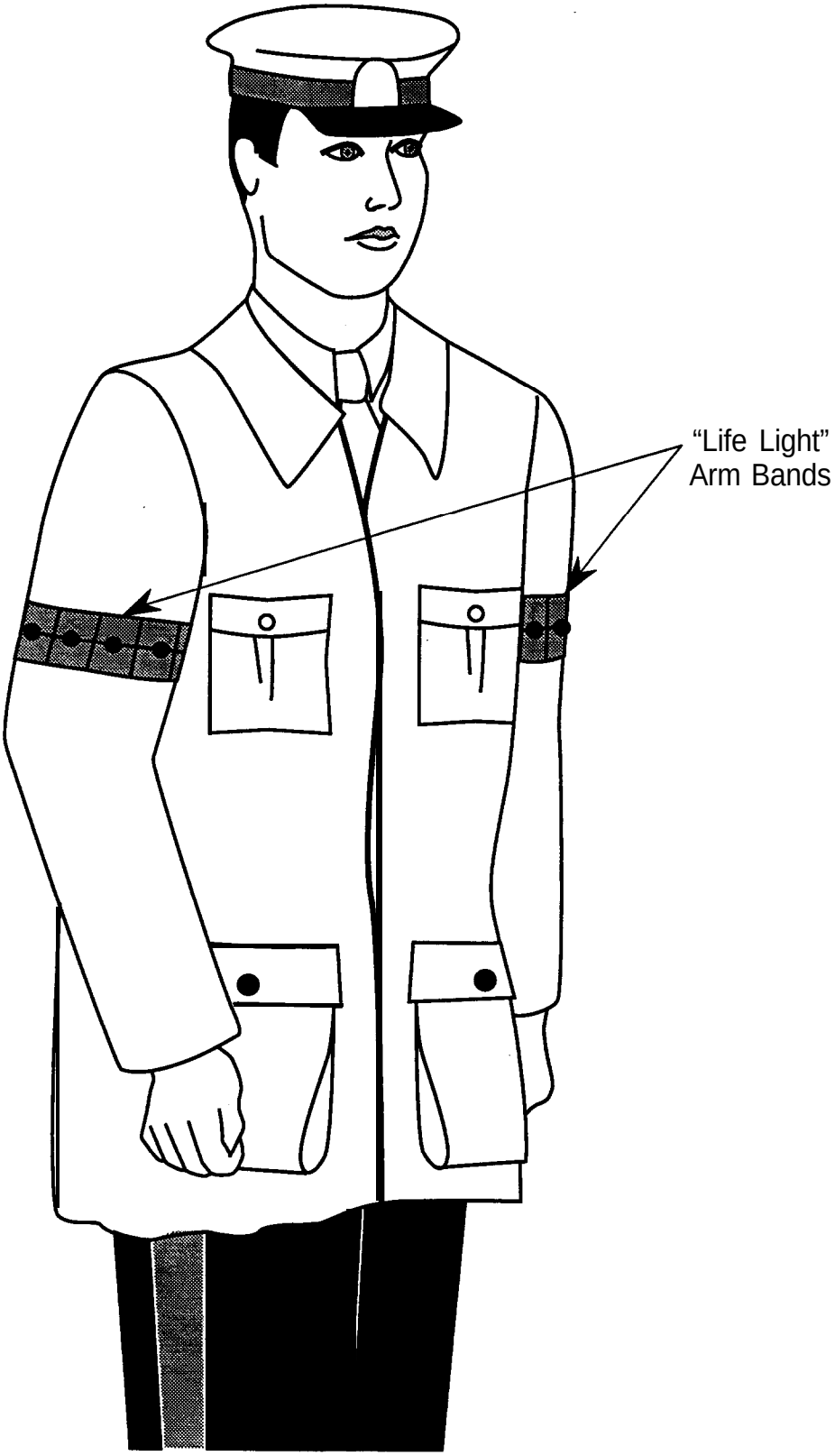
The “Emergency Strobes” and “Life-Light” strips both operate to -45 degrees centigrade with the only difference being that the flash rate increases with the cold. The lower temperatures does not seem to be affect battery life. The units have withstood ten months of severe operation. They have been thrown into the plastic tubs in the patrol car trunks and have continued to operate without any malfunction. Three batteries have been replaced (it is believed to be as a result of the “Life-tight” strips being left switched on while being stored). The units work best during the dusk to dawn period. During the bright sunlight the emergency flares are better for marking accident scenes.

There was a reluctance to use the “Emergency Strobes” and the “Life-Light” vests at accident scenes or “Check Stops”. This might account for the extra use of emergency flares over the past fourteen months. However at “Check Stops”, the motoring public commented on the officers’ visibility when wearing the “Life-Light” vests. They also agreed that they could see them more easily than in the situation with flares that used to blind them.

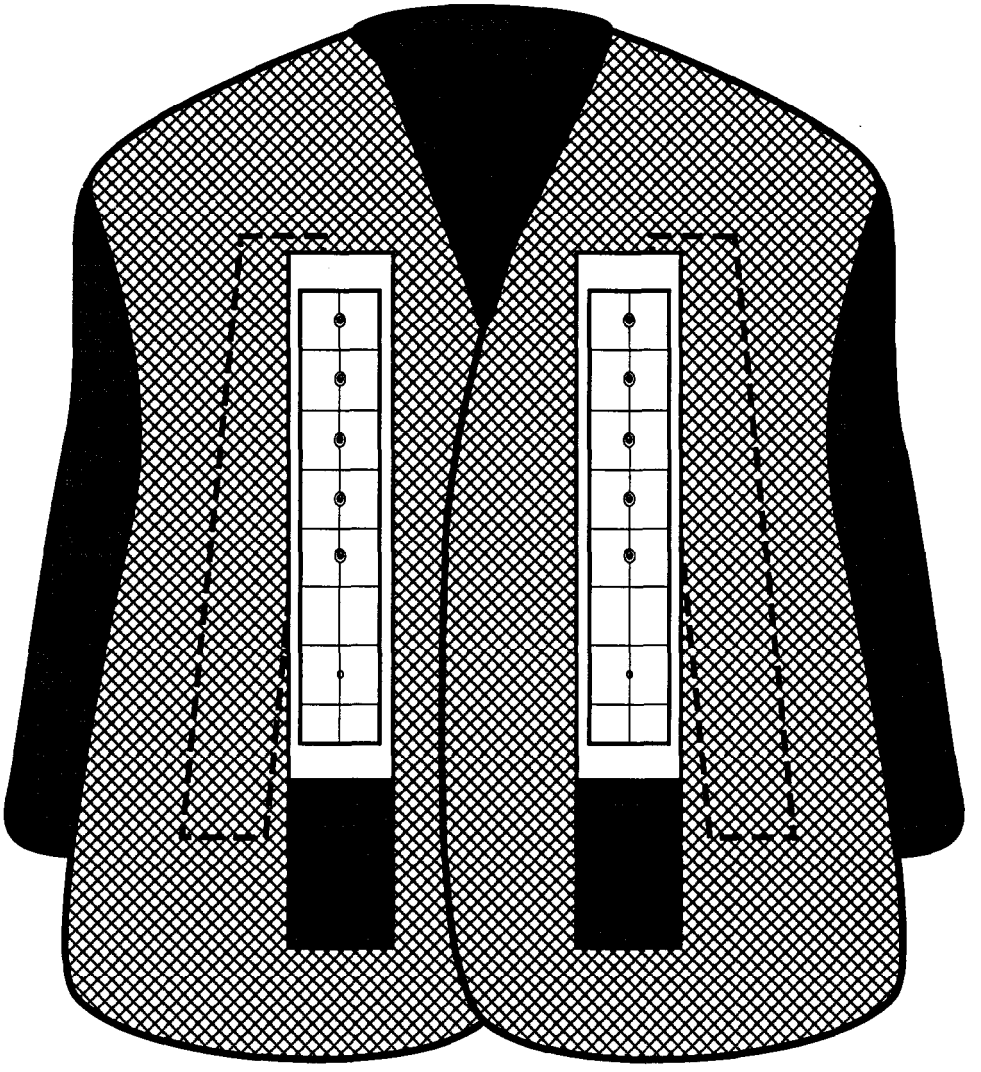
With hazardous shipments including high octane gasoline and methanol travelling the highways police are more likely to become involved in these highly volatile situations. The use of emergency flares in these instances would be extremely hazardous. A recent incident involving a semi-trailer and pup overturned in the median at an accident scene. The tanker burst and high octane aircraft fuel spilled over onto the highway. There was no alternative equipment other than the flares that were in use at the time. This incident started the search for an alternative to the emergency flares and only confirmed the negative aspects of flares as described earlier. This fuel hazard is eliminated with these new products protecting both the scene and the officers from any added danger.



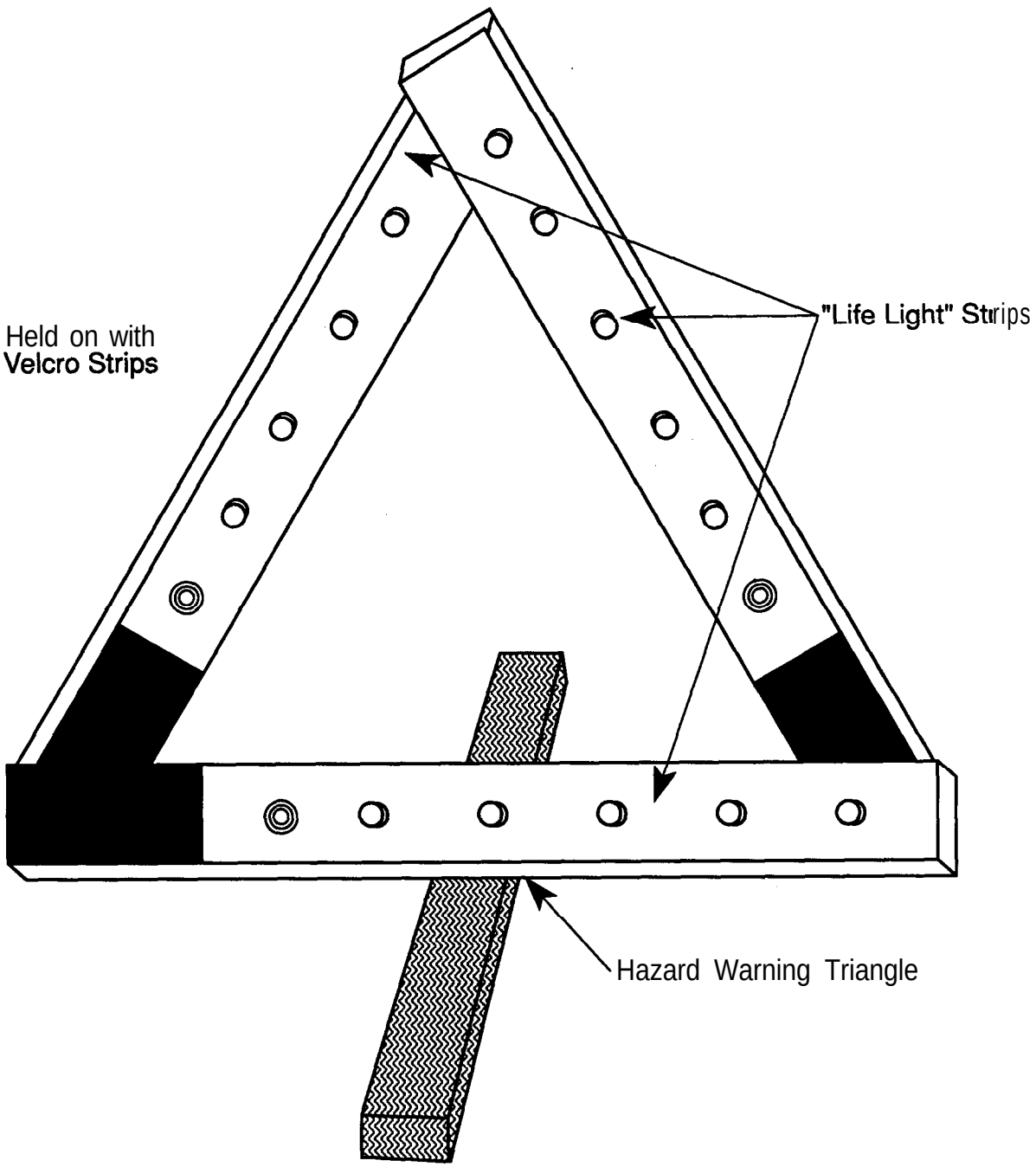
1 (a): "Life-Light" Strip/Arm Bands



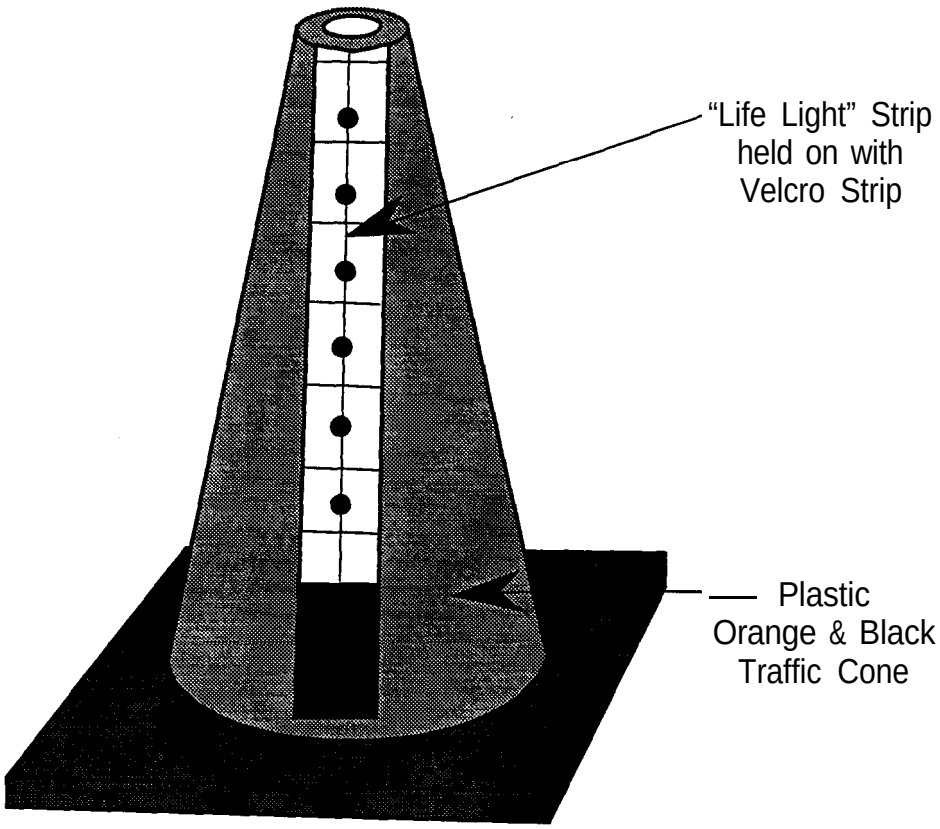
1 (b): Life-Lite Arm Bands on Officer



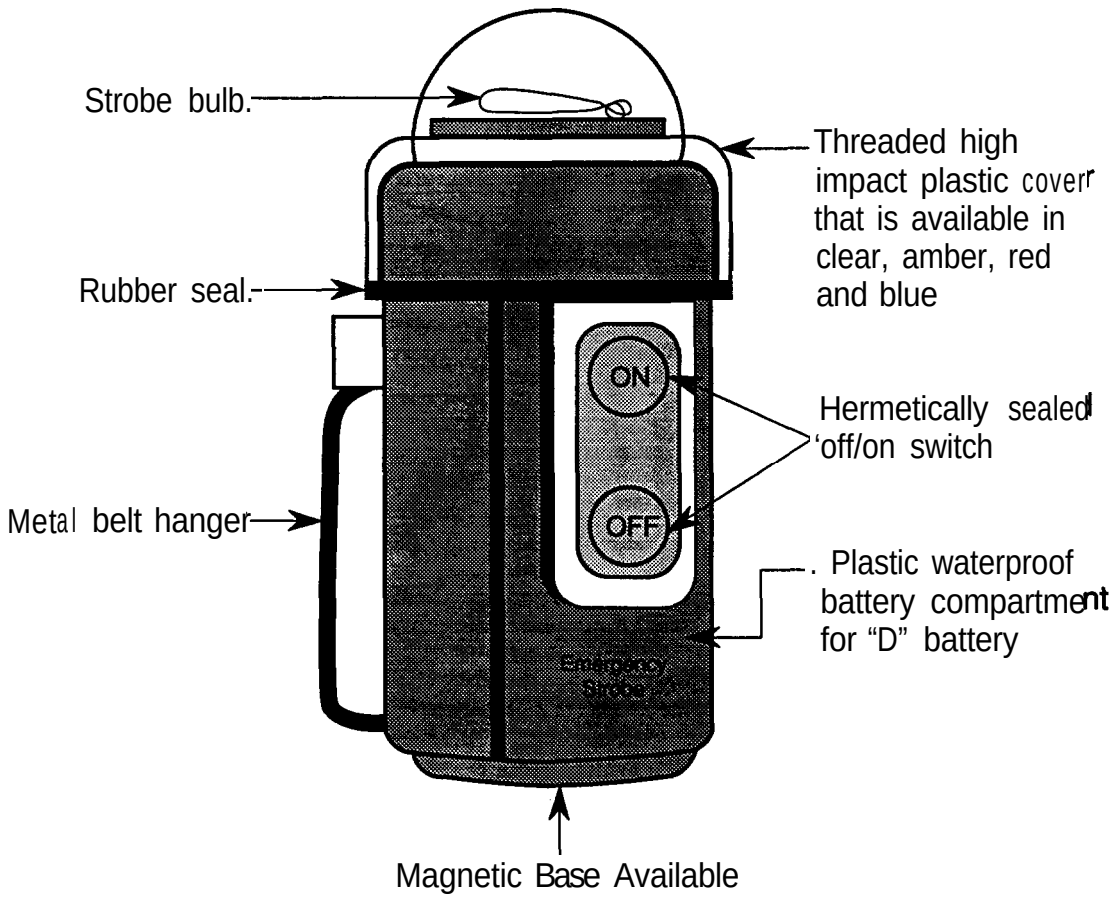
2: Safety Traffic Vest with “Life Lite” Strips Velcroed to Front and Back



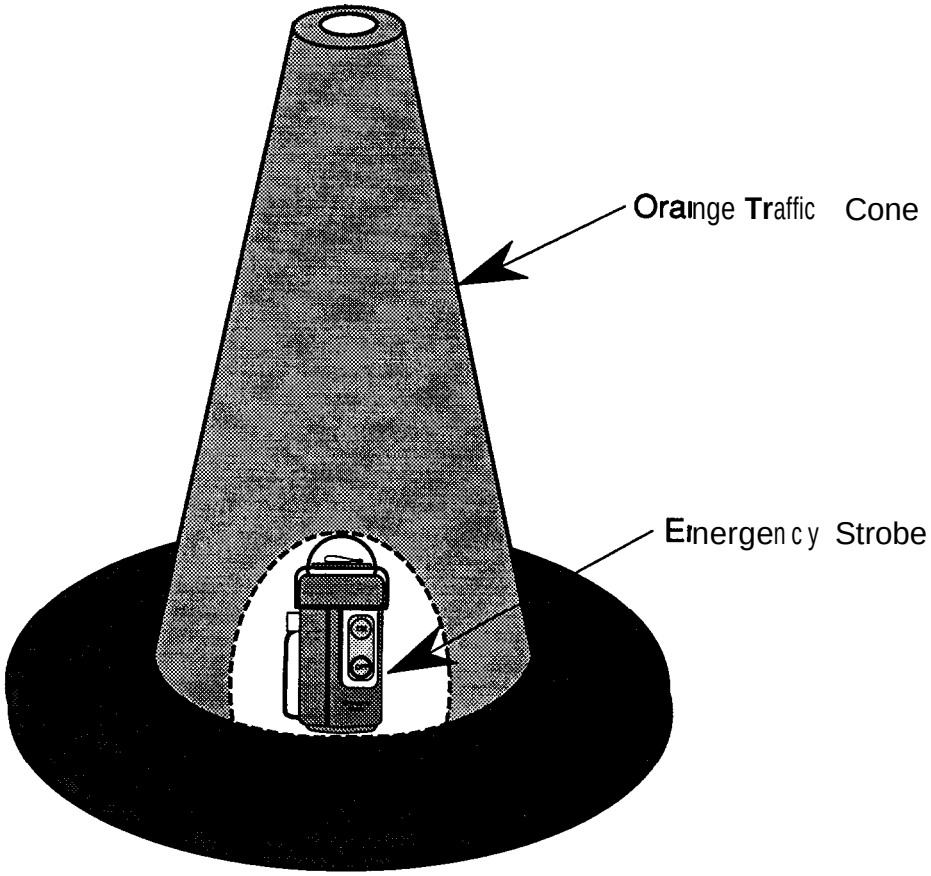
3: **Life-Light Strips of Safety Triangle**



4: **Traffic Cone with "Life Light" Strip**



5: *'Emergency Strobe" (actual size)



6: “Emergency Strobe” inside a traffic cone