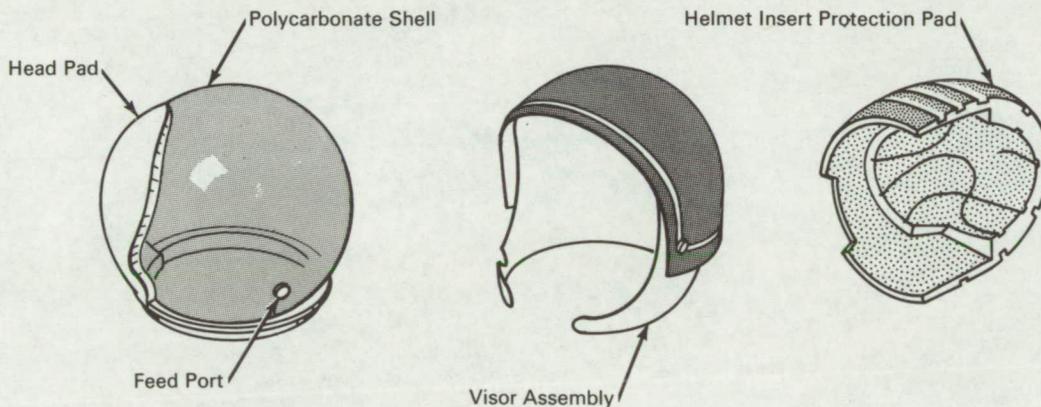


# NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U. S. space program and to encourage their commercial application. Copies are available to the public from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

## One-Piece Transparent Shell Improves Design of Helmet Assembly



### The problem:

To develop a helmet assembly that offers improvements in the following areas: visual field; impact protection; radiation and glare protection; operational simplicity and reliability; comfort, pressurized feeding, drinking, or emergency oxygen supply; adequate head ventilation; antifogging of visor; and quick don/doff capability. Earlier helmets were heavy (averaging between 13 and 15 pounds) and large, lacked adequate visual capability, were uncomfortable, and could not be donned or doffed quickly.

### The solution:

A one-piece transparent helmet shell made of molded polycarbonate with the addition of a helmet protection pad, a visor assembly, a communications skull cap, and an emergency oxygen supply.

### How it's done:

The one-piece helmet shell, fabricated from polycarbonate (or similar) material is transparent, permitting unrestricted vision in whichever position the head is turned. The polycarbonate material provides significantly greater impact protection, ultraviolet and infrared absorption, and is considerably lighter (6 3/4 pounds) than materials used in earlier helmets. The one-piece shell has only two openings; the opening for the head and the feed-port opening. The helmet head pad is a lightweight pad for the back of the head to provide compact protection and to incorporate the vent ducting. The helmet insertion protection pad fits between the helmet interior and the man's head for protection against buffeting, vibration, and impact. The lightweight visor assembly provides radiation, glare, and thermal protection.

(continued overleaf)

**Notes:**

1. A communications skull cap to carry various communications devices may be used within the helmet by the wearer. An emergency oxygen supply may be attached to the helmet through the feed port.
2. The helmet assembly may be used by personnel working in hazardous atmospheres and the general configuration may serve as a model for deep sea diving helmets.
3. The visor concept may be applied to welder's masks, helmets worn by jet pilots, race car drivers, mountain climbers, motorcyclists, etc.

4. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Manned Spacecraft Center  
Houston, Texas 77058  
Reference: B66-10390

**Patent status:**

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Dr. Robert L. Jones,  
and James H. O'Kane  
(MSC-187)