

The "PLTZ" Goggles.

In the early seventies, a new goggles/helmet combination to better protect SAC's aircrews against nuclear flash blindness was developed by the Air Force. The protection device (helmet-mounted special goggles containing four lenses) was developed under a \$7.2 million contract managed by Aeronautical Systems Division at Wright-Patterson AFB, Ohio. The requirements for the goggles was orchestrated by Cal Crochet, SAC Life Support System program manager, who was the direct interface with Sandia Laboratories at Kirtland AFB, NM. The idea for the goggles came from Cal's experience during his early days of flying helicopter (1957) at Eniwetok Atoll during nuclear tests under "Operation Hardtack" and later from his experiences with the flash curtain, gold goggles and eye patch problems encountered as a SAC B-47 and B-52 aircraft commander with the 306th and 509th Bomb Wings..

Flash blindness is a temporary visual impairment caused by a tremendous amount of light emitted by a nuclear weapon's explosion. The sensitive rods and cones on the surface of the eye's retina become overloaded or 'bleached out'. This is the same phenomenon experienced when a person exits a darkened theater into bright sunlight. Just as an auto driver can be temporarily blinded by a set of of oncoming headlights, an aircrew member's ability to maintain control of an aircraft can be seriously jeopardized. The goggles provided both flash blindness and thermal protection for the area covered. The thermal flash blindness protection device operated on the same principle as a pair of polarized filters that, when oriented 90 degrees to one another, stop all light from passing through. Rotation of the optical lenses was accomplished electronically through application of an electro-optic material containing lead, lanthanum, zirconium and titanium. Under normal light conditions (open state), the lenses looked like ordinary sun shades. When a bright explosion occurred, a simple photocell and transistor amplifier caused the lens to become totally opaque (closed state) for as long as the triggering flash remains. During this condition (closed state), the crewmembers will continue to have visual acuity (similar to viewing through

welder's goggles); whereby, their respective duties can still be performed without the effects associated with flash blindness. The lenses could close off light in microseconds, and absorbed as much as 25 calories of heat per square centimeter.

The goggles were affixed to the helmets by the individual aircrew members when their use was required. To get them in place, a crew member had 20 seconds to pick them up, raise them over head and while holding them out horizontally, slide them down the front of the helmet onto the connections and then snap the protective devices on. The PLTZ goggles were sealed in plastic inside a canvas bag that was attached with velcro under the glare shield in front of the TFR scope.

First production goggles were delivered to Chanute AFB, Ill. for the training and maintenance personnel. In early fiscal year 80, SAC FB-111 aircraft at Pease AFB, NH and Plattsburgh AFB, NY did undergo cockpit modifications to accommodate the power pack of the thermal flash blindness protection device. The lenses are energized by low amperage 28 volt DC current.