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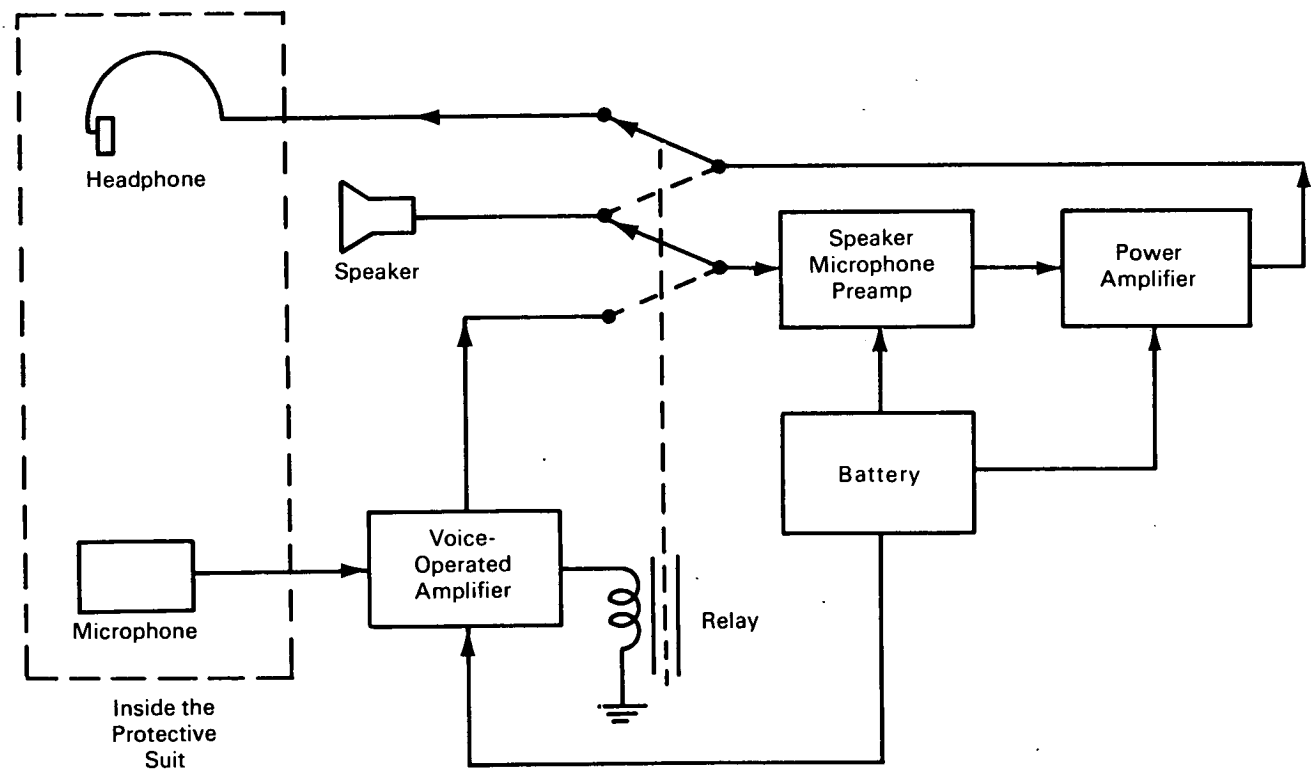
Brief 70-10335

NASA TECH BRIEF

Self-Contained Miniature Electronics Transceiver Provides Voice Communication in Hazardous Environment



The problem:

A workman who handles corrosive substances and performs duties in a high-temperature environment requires protective clothing and a face mask. Voice communications between the workman and a central control station must be maintained to convey instructions and to provide a "psychological" sense of attachment to his fellow workers. The voice communications system must fulfill the following requirements: (1) the communications equipment must not impede the freedom of movement of the worker, i.e., he must not be restricted by cables attached to his person; (2) operation of the system must be automatic—the voice of the worker provides the input energy to activate the system in the proper mode; (3) the worker must be able to maintain an acute awareness of his surroundings and must hear sounds which are advance warnings of impending hazards (hissings of gas, cracking of materials, voice warnings and the like); and (4) the communications system must not introduce an

(continued overleaf)

additional hazard, i.e., the rf output power must not activate electromagnetic sensitive devices such as fuses or explosives.

The solution:

A two-way wireless voice communications system has been developed that fulfills all of the requirements. It consists of a combination speaker-microphone unit and an electronics unit that hangs around the neck of the worker.

How it's done:

As shown in the block diagram, the user merely speaks into the microphone and his voice is transmitted, external to the protective suit, by the combination speaker and receiver. When he is not talking, the system is in the receive position so that he can hear noises above a particular audio level in the immediate vicinity. The voice-operated amplifier must be biased to a certain level to prevent activation by noises (inside the protective suit) such as the hissing of flowing air. The system is normally operated in a receive condition except when the user speaks. In the transmit mode the unit becomes a miniature audio amplifier with a power output of about one watt. In one particular application, users of the system were able to communicate (at normal voice level) at a distance of fifty feet.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Kennedy Space Center
Kennedy Space Center, Florida 32899
Reference: TSP 70-10335

Patent status:

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