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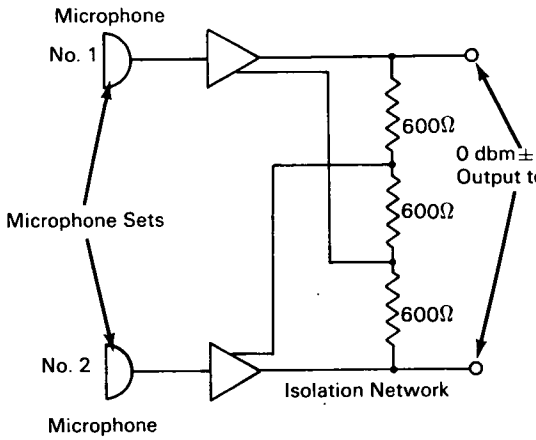
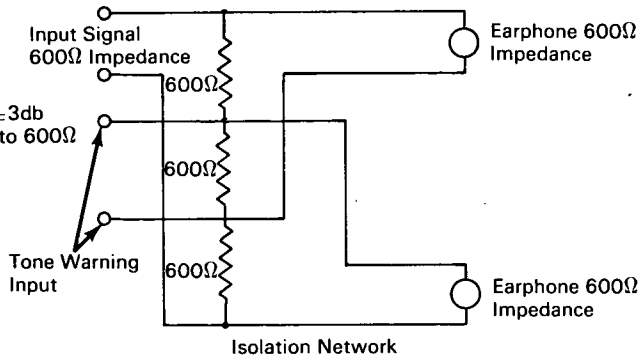
NASA TECH BRIEF

Personal Communication System Combines High Performance with Miniaturization



MICROPHONE CIRCUITRY



EARPHONE CIRCUITRY

The problem:

Specifications for a personal communication electronic system required a high level audio output capability in the earphone subassemblies and high signal-to-noise ratio in the microphone and amplifier assembly. Additionally, the specifications required that all system components be miniaturized for use in limited workspace such as space suit applications.

The solution:

A personal communication system that provides miniaturized components that incorporate high level signal characteristics plus noise rejection in both microphone and earphone circuitry.

How it's done:

The microphone (based on a commercially available microphone concept) is designed to overcome such spacecraft flight problems as size, ambient noise level, and rf interference. The total integrated unit consists of a housing, two-part acoustic tube assembly, microphone amplifier, isolation network, plus mounting provisions and wiring harness. For redundancy, two microphones provide an output level through an isolation network to a balanced load (600±60Ω) of 0 dbm±3 db for an input of 96 db and 10 db±3 db for an input of 116 db.

Each earphone assembly includes 6 transducers to obtain a high level audio output of improved quality in the presence of ambient noise. Each assembly is flexible for use in an earmuff or directly into the ear, and consists of the transducers, isolation network, housing, plus mounting provisions and wiring harness. A tone warning input signal circuit is also provided to alert the operator to incoming intelligence. With two earphones connected to the isolation network (driven at 4 milliwatts sinewave), the output sound pressure level of each earphone, measured at 1000 cps in a 6 cc cavity, is 108±3 db (0.0002 dyne/cm^2).

(continued overleaf)

Notes:

1. This system meets all specification tests including electromagnetic, humidity, temperature, vibration, vacuum, and shock.
2. This system should be useful where workspace requirements necessitate miniaturization and very high levels of noise rejection.
3. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Manned Spacecraft Center
   Houston, Texas 77058
   Reference: B67-10119

Patent status:

No patent action is contemplated by NASA.

Source: Norman D. Atlas
of North American Aviation, Inc.
under contract to
Manned Spacecraft Center
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