AD 415280

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SPACELABS, INC.

MONTHLY PROGRESS REPORT NO. 1

Contract No. DA18-108-AMC-228(A)

Dynamic Measurements of Protective Masks

This report covers the period from 1 July to 31 July 1963.

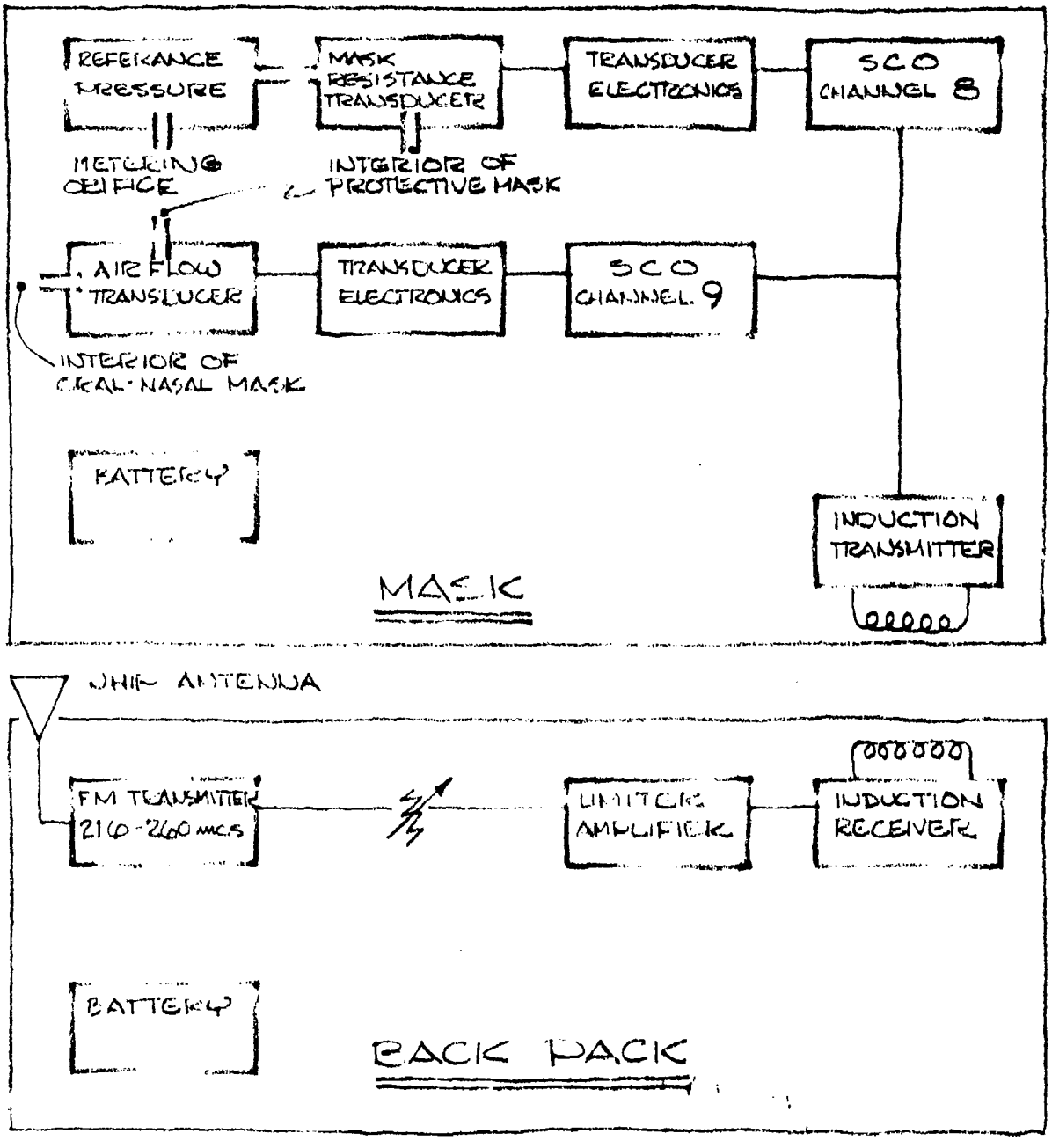
General

The objective of this contract is to develop and produce an electro-mechanical system capable of detecting, measuring in a linear manner, and recording rapidly changing air pressure inside of and airflow through the protective mask during mask wearing by soldiers under dynamic operating conditions.

Work Performed During This Period

Work on the contract started 1 July 1963. The basic system design has been completed and approved by the Project Officer. The system consists of three units. The mask unit contains two differential pressure transducers, transducer electronics, two subcarrier oscillators, and an induction transmitter. The Back Pack contains an induction receiver, limiter amplifier and retransmitter (Figure 1). The Receiving Console contains a preamp multicoupler, ten receivers, two discriminators, a strip chart recorder, and necessary switching means to allow connecting the discriminators to any one of the ten receivers. In addition, provision is made to connect a tape recorder allowing simultaneous recording of all ten receiver outputs (Figure 2).

Discussions with the Project Officer have indicated that it is not acceptable to break the integrity of the mask to vent the reference side of the mask pressure transducer to outside ambient. This transducer will tentatively be provided



BLOCK DIAGRAM MASK & BACK PACK

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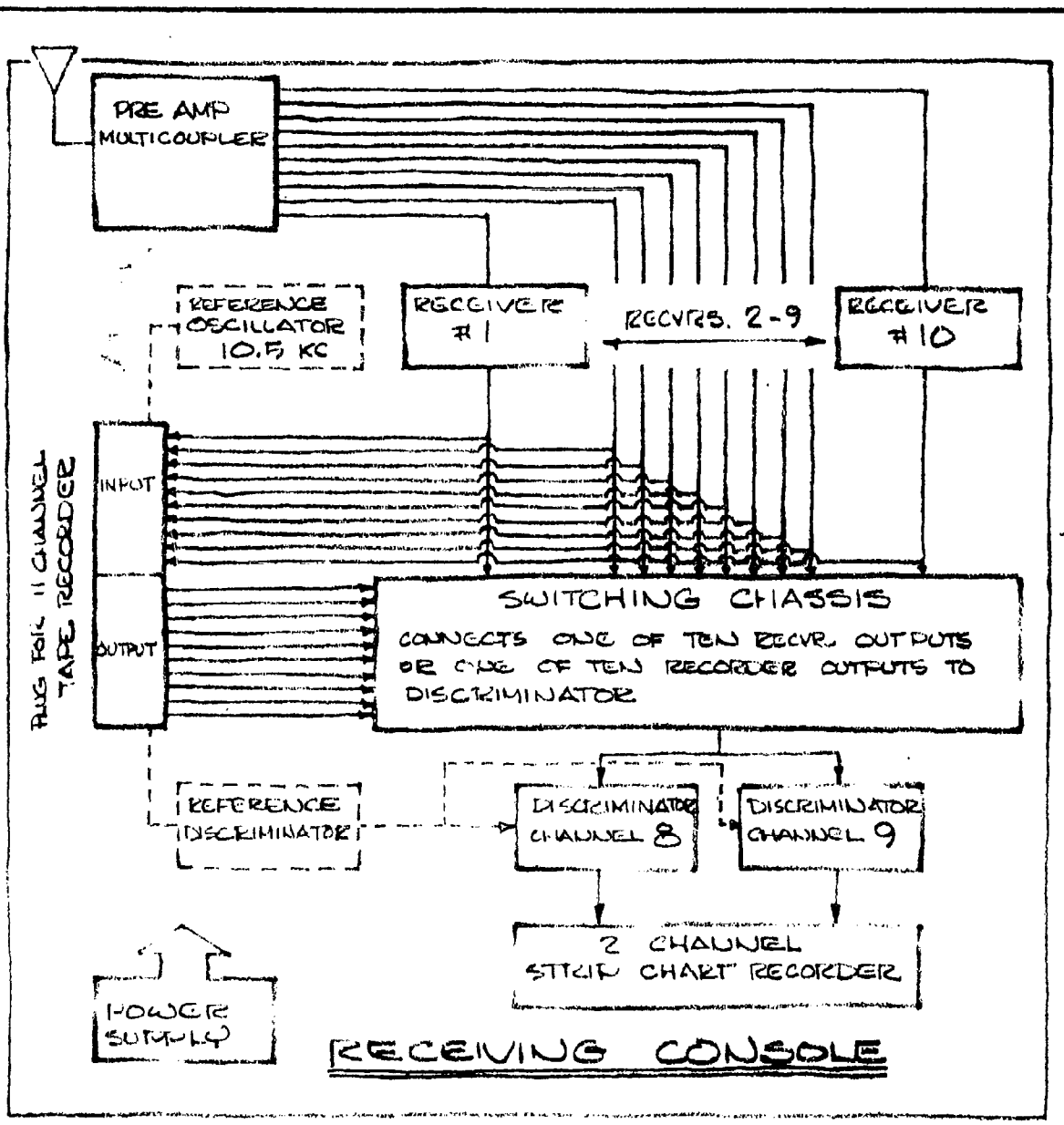

BLOCK DIAGRAM RECEIVING CONSOLE

with a small "leaky" reference chamber vented by a metering orifice to the interior of the mask. The time constant of this reference chamber shall be long enough to prevent loss of low frequency data down to an acceptable cutoff frequency. This device will introduce some baseline shift for the first few time constants after starting use of the mask and will cause some baseline drift governed by the breathing pattern. Estimate of the magnitude of this drift appear to be within acceptable limits.

The preamp multicoupler, receivers, one transducer, one transmitter, and miscellaneous breadboard parts have been ordered and received. Design of the transducer electronics has been started. Tests to determine the presence and possible effects of spurious receiver responses and spurious transmitter radiations are underway.

Specifications to insure compatibility of the tape recorder with the measurement system have been prepared and submitted.

Work Planned For The Next Reporting Period

1. The design of the transducer electronics package will be completed and a working breadboard fabricated.

2. The subcarrier oscillator design will be completed and a breadboard fabricated.

3. The design of the induction transmitter and receiver will be started.

4. The electrical design of the receiving console will be completed.