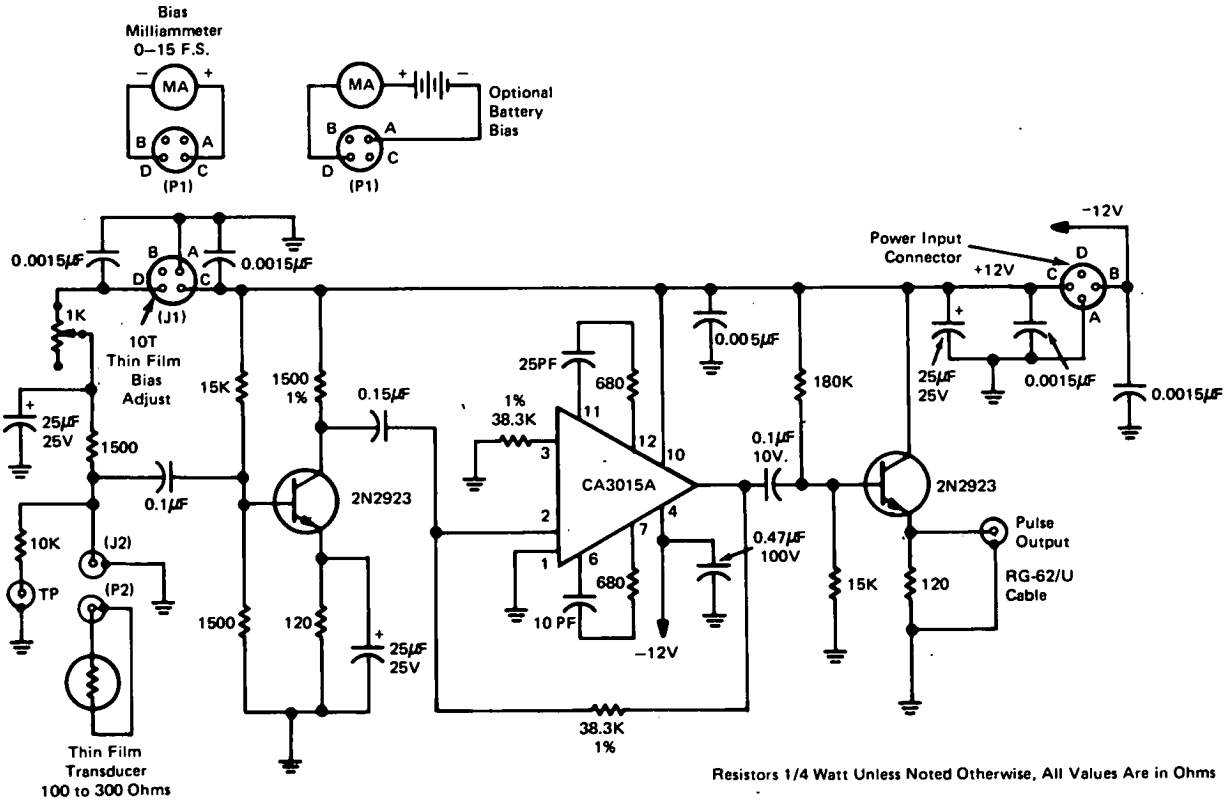
NASA TECH BRIEF

Lewis Research Center

Amplifier for Signal from Thin Film Transducer



Resistors 1/4 Watt Unless Noted Otherwise, All Values Are in Ohms

Electronic circuitry has been devised to raise the low level signal from a platinum film type transducer to a sufficient amplitude to trigger an oscilloscope or time interval counter. This amplifier has been used with shock tube apparatus to measure wave velocity between two or more points, and also to generate a timing signal to trigger an oscilloscope. The circuit could be used wherever it is necessary to raise the level of a low amplitude, low impedance positive polarity pulse source to a 5-or 6-volt level.

The delicate construction of the thin platinum film transducer necessitates a low value of bias current, thereby limiting the available output signal. The circuit shown in the figure overcomes this problem and delivers the signal suitable for the shock tube measurements. The input circuit biases the transducer at one to ten milliamperes; this is adjustable and determined by the thin film characteristics. Power for biasing is normally drawn from the amplifier supply, but with the connections shown, an optional battery supply may be used.

(continued overleaf)

The first stage is a buffer amplifier providing slight gain and signal polarity inversion. The next stage is an operational amplifier designed to differentiate the amplified pulse and restore the original signal polarity. This amplifier has a rise time of 0.5 microsecond and a voltage gain of about 3000. Short leads, adequate power supply bypassing, and grounding are important. The final stage is an emitter follower biased slightly less than cutoff to pass all positive polarity 6-volt peak signals. The entire assembly was mounted in a 3 x 4 x 2 inch (7.6 x 10.2 x 5.1 cm) box installed directly on the transducer.

Note:

No further documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
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Reference: B72-10463

Patent status:

No patent action is contemplated by NASA.

Source: K. A. Jensen
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(LEW-11494)