

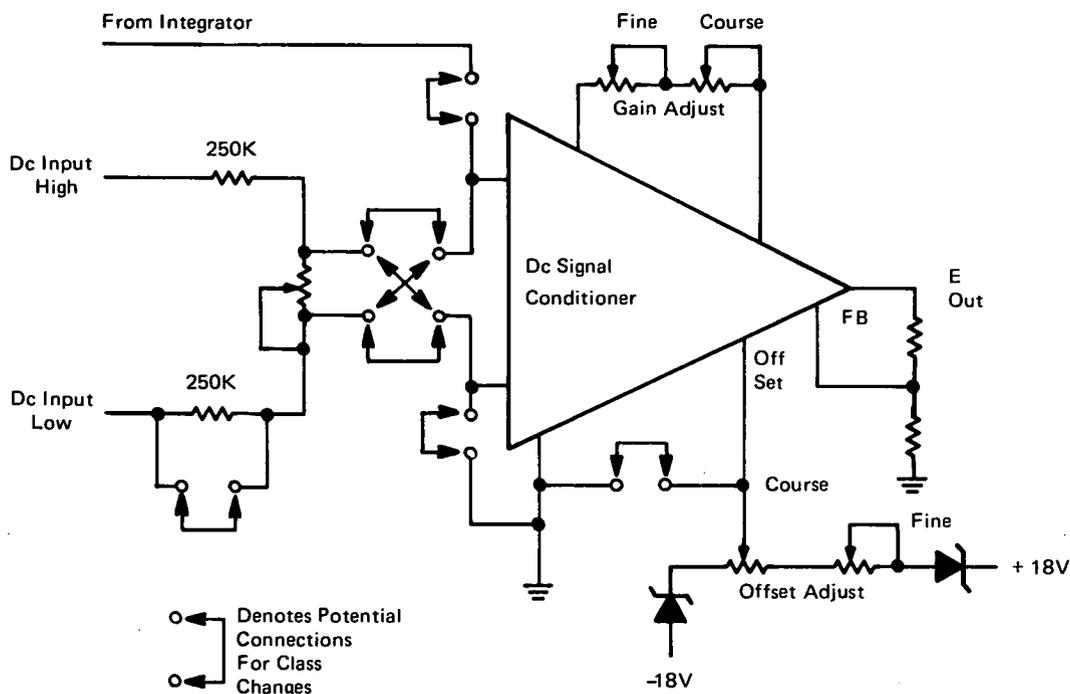
# NASA TECH BRIEF

## Manned Spacecraft Center



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### Universal DC Signal Conditioner



#### The problem:

In order to adapt a wide range of dc signals to the requirements of telemetry systems, many different types of dc signal conditioners may be needed.

#### The solution:

A universal dc signal conditioner has been designed which can condition dc signals over a range of  $\pm 50$  volts. It is lighter, has lower initial and maintenance costs, and higher reliability than conventional discrete circuit designs.

#### How it's done:

This conditioner incorporates linear integrated circuits in conjunction with hybrid, thin-film circuit technology to achieve a high degree of circuit miniaturization. The

circuit can be made to accept many different ranges of input signals by simply repositioning an internal electrical connector. Through the use of this "class change" concept, the conditioner can process dc signals with gains up to 100 or attenuation factors of as large as 30.

The class change concept allows the use of one part for a multitude of signal conditioning functions. An external adjustment will change the conditioner function without removing the conditioner from the system. This significantly shortens set-up and calibration time and removes the possibility of errors arising from disassembly and assembly to change a circuit.

The dc conditioner (shown in the figure) will accept a differential dc input signal or the output of a filter integrator circuit to yield a 0- to 5-volt output signal.

(continued overleaf)

The conditioner contains an instrument amplifier which provides an output voltage proportional to the difference between two input signals. The amplifier has a basic frequency response from dc to 10 kHz and a gain which is continuously adjustable from 1 to 100. The zener diodes and variable resistors indicated in the figure provide a means of adjusting the amplifier offset for unipolar and bipolar signals and expanded scale functions.

**Patent status:**

NASA has decided not apply for a patent.

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**Note:**

Requests for further information may be directed to:

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