NASA TECH BRIEF

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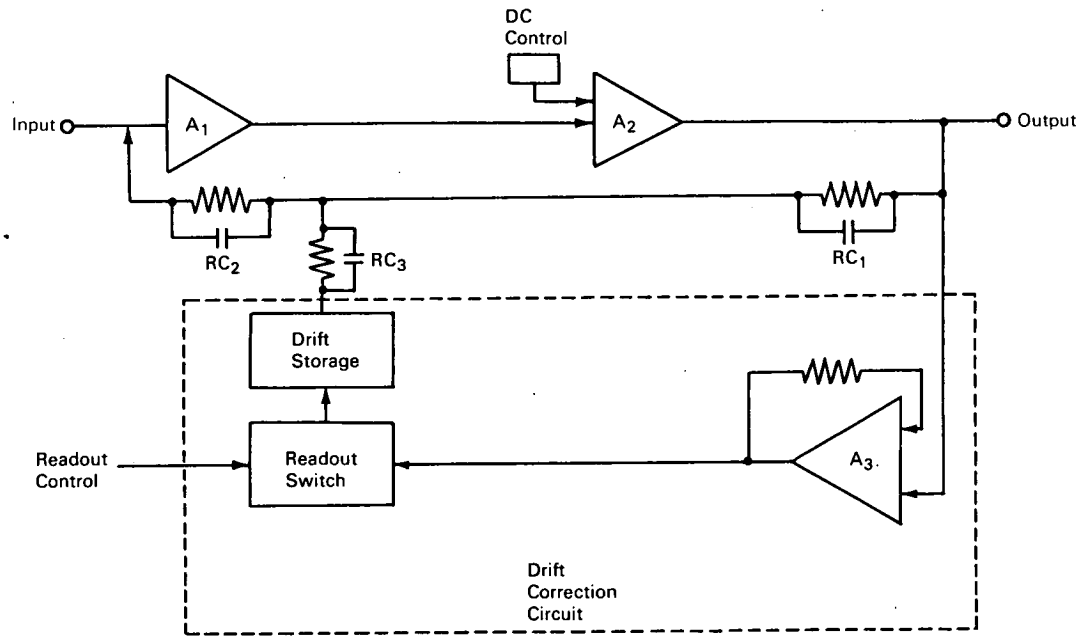
Electrometer Preamplifier Has Drift Correction Feedback



The problem: Correcting for output drift in an electrometer. Because the electrometer is operated in a keyed (noncontinuous) mode, when no output signal is being applied, output level must be maintained at zero or some constant reference level in order that readout be accurate when an input signal is next applied.

The solution: A circuit using negative feedback in the no signal state to maintain the output level at zero reference and using drift voltage storage in the signal on state to provide drift-free readout.

How it's done: A conventional electrometer preamplifier consists of amplifiers A_1 and A_2, and the negative feedback network consisting of RC_1, RC_2, and RC_3. The output level is set to the zero reference level by adjusting the dc control on A_2 just prior to readout. When the drift correction circuit is added, any drift from the zero reference level produces a large change in the voltage level at the output of A_3, a differential input transistor amplifier with high dc stability. The output from A_3 is fed through the readout switch to the drift storage circuit and then to the feedback network as negative feedback, thereby maintaining the preamplifier output at the zero reference level. When a signal is applied to the preamplifier, a signal is also applied to the readout switch which disconnects the drift correction circuit from the

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preamplifier. The drift storage circuit maintains the drift correction voltage that existed prior to readout for 10 to 20 seconds, thus ensuring that the voltage at the preamplifier output is always relative to the required zero reference voltage level.

Notes:

1. This invention should have application in any circuit which requires high input impedance and operates in a keyed mode.
2. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Jet Propulsion Laboratory
   4800 Oak Grove Drive
   Pasadena, California, 91103
   Reference: B65-10267

Patent status: NASA encourages the immediate commercial use of this invention. Inquires about obtaining rights for its commercial use may be made to NASA, Code AGP, Washington, D.C., 20546.

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