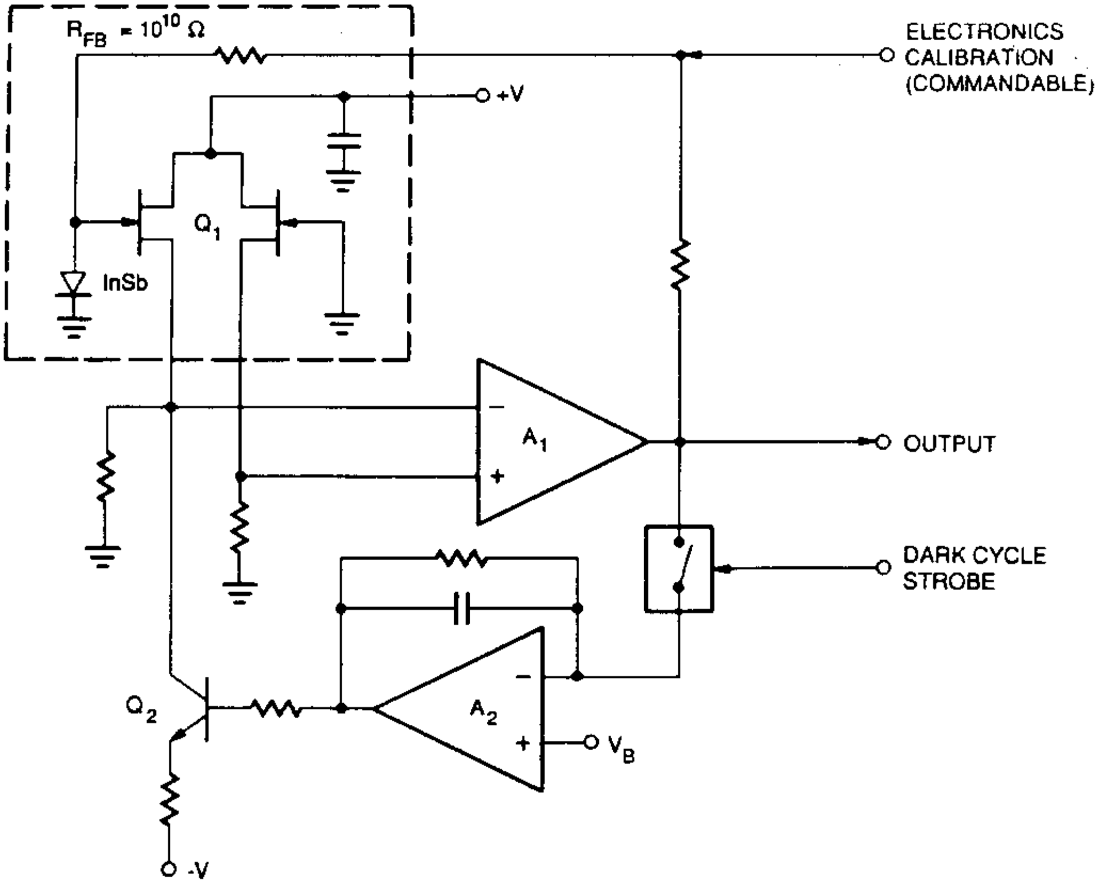


Fig. 8. Preamplifier and Autobias Circuitry.

**The components (detectors, field effect input transistors, feedback resistors, and bypass capacitors) contained within the Focal Plane Assembly (FPA) are shown in the outlined rectangle in the upper left of the Figure. A differential source follower drives operational amplifier A1, which forms a transresistance amplifier using feedback resistor RFB. The output of this preamplifier feeds the remaining signal processing circuitry shown in Fig. 9. Automatic biasing of the detectors is accomplished by sampling the output of A1 during the dark portion of the chopper cycle; this signal is sampled and averaged using amplifier A2. The output of A2 controls the drain current of the input transistor, which controls its gate-source voltage VGS, and holds the bias of the InSb photodiode detector at zero bias voltage. With this zero bias condition, dark current changes due to changes in detector temperature remain small, yielding a large temperature operating range before amplifier saturation occurs. This bias condition also ensures detector linearity and minimizes detector noise.**