

**Voltage-controlled
video amp makes
wide-ranging AGC**

Video amplifiers having differential inputs lend themselves to applications where their peak output can be easily set by a control voltage—a property that makes them excellent as automatic gain controls, observes Yishay Netzer of Haifa, Israel. In contrast with amplifiers whose output is controlled by varying their transconductance (current control), the differential devices **have wider bandwidth and are much simpler to implement in AGC stages.**

Netzer uses the Fairchild $\mu A733$, plus a field-effect transistor as a voltage-controlled resistor. Either an n- or a p-channel FET may be chosen, depending on whether the control voltage, V_c , is negative or positive. The FET's source and its drain (operating without supply voltage) are connected between the emitters of the differential-input transistors of the $\mu A733$, pins 9 and 4 respectively. The control voltage is applied to the gate of the FET through a 20-k Ω resistor. To linearize the response further for large signal swings, a 20-k Ω resistor in series with a 0.1- μF capacitor can be placed between the gate of the FET and pin 4 of the $\mu A733$. The gain of the amplifier is inversely proportional to the FET's resistance and is given by $A = A_o(1 - V_c/V_p) + A_p$, where A_o is the FET's nominal gain, V_p is its pinch-off voltage, and A_p is the gain at pinch-off and beyond.

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