

# SMART "S" METER

*A circuit designed for T-Hunters.*

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This design is for an external signal strength meter that is analog, digital, and audible for mobile "T-hunters." The S meter can easily be made into a small box and placed on top of the T-hunters automobile dash. The S meter also incorporates my secret weapon: a gain circuit. This circuit is nothing special, except that it is able to obtain optimal metering for a good beam bearing. An optional addition to this design is a dampening action. The S meter signal dip that over deviates, is averaged out by modulated transmitter signals or a common occurrence with this dampening action.

The analog meter is a 0-1 mA milliammeter, which is ideal for observing or comparing peak signals when beaming a transmitted one. The analog calibration pot is used to calibrate the external meter with the radios internal meter and control the amount of meter action.

The digital LED bar graph display has a very fast response time and is ideal for nighttime T Hunting. The digital calibration pot works the same as the analog calibration pot. The 3.3KΩ resistor near LM 3914 can be replaced with a 5K pot to control LED brightness.

### Safety First

The audible S meter was added for T Hunter safety. The audible allows a T Hunter to swing the beam while traveling in heavy traffic, not requiring his attention to be distracted from the road. This is especially useful when in pursuit of a jammer or on a first-in-first-win T Hunt when speed is critical. The tone pitch will go higher as the signal gets stronger. The tone adjust pot is used to center the audio for optimum listening. The audible meter is not connected to the gain circuit; as the only time the audible meter would be used is when the hunter is close to the hidden transmitter where gain isn't needed.

### Key to Success

The gain part of this design is what allowed me, in part, to be a rather successful T Hunter in the L.A. area. When a signal is so weak it is barely audible, this gain feature has allowed me to get a good beam bearing; while all the other hunters switch in their preamps and saturate the radio front ends with off frequency noise. The S2A position gives a 2:1 gain and the S2B position gives about a 50:1 gain. The calibration pots control the amount of

meter action relative to the gain. When the signal is heard but not registering on the radio S meter, turn back the calibration pot to zero and the meter will now show the 2:1 gain. If the meter is not showing a significant signal, switch to the 50:1 gain. The hunter needs to recalibrate for an optimal meter indication.

The optional dampening circuit is used for the averaging of a transmitted signal that has modulated power or when a dip on the voice peaks occur. The capacitors may be switched one by one or switched into a very slow response using 5.8 uF total capacitance.

To minimize the loss of eye contact with the road, I used velcro strips to attach the box to my automobile dash. Three conductor shielded mike wires were used between the radio and the external S meter. A subminiature stereo plug was used for the interface. The tip of the plug for the S meter has the power of +12VDC from the radio. The mid-section of the plug is for the signal and the shield is used for the ground. This makes a very neat looking arrangement to the radio. All parts were obtained from Radio Shack. Many alterations and customizing can be done to further enhance this basic circuit for your needs. (Credits to: K6KYW and KF6GQ)

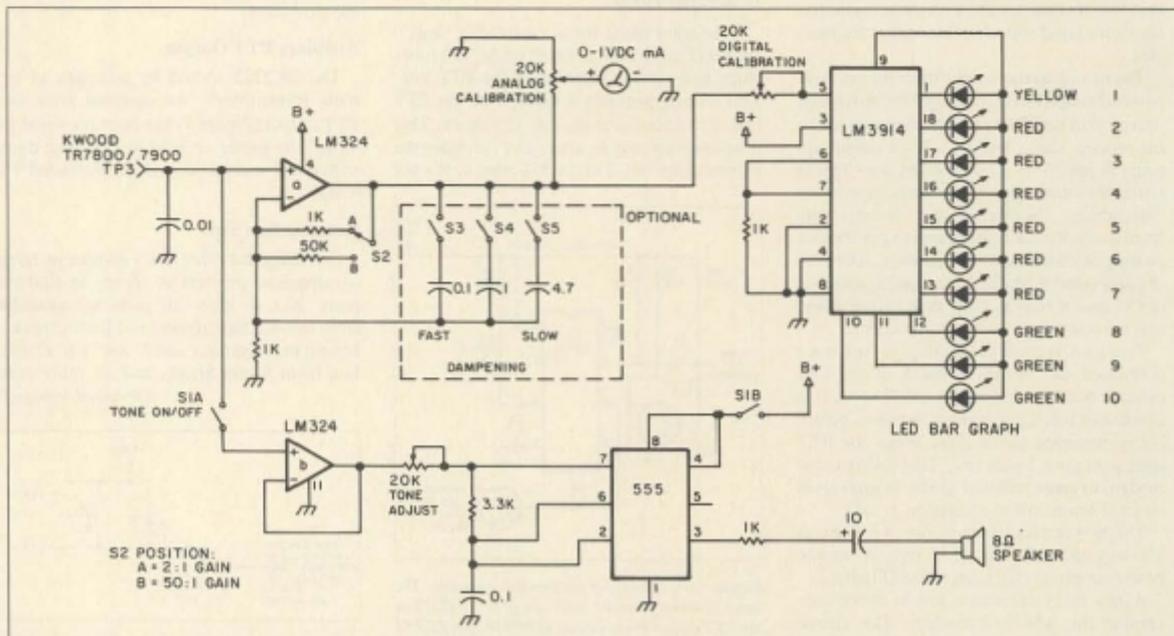


Figure 1. Circuit board for the smart S meter including the analog, digital, and audible for hidden transmitter hunters.