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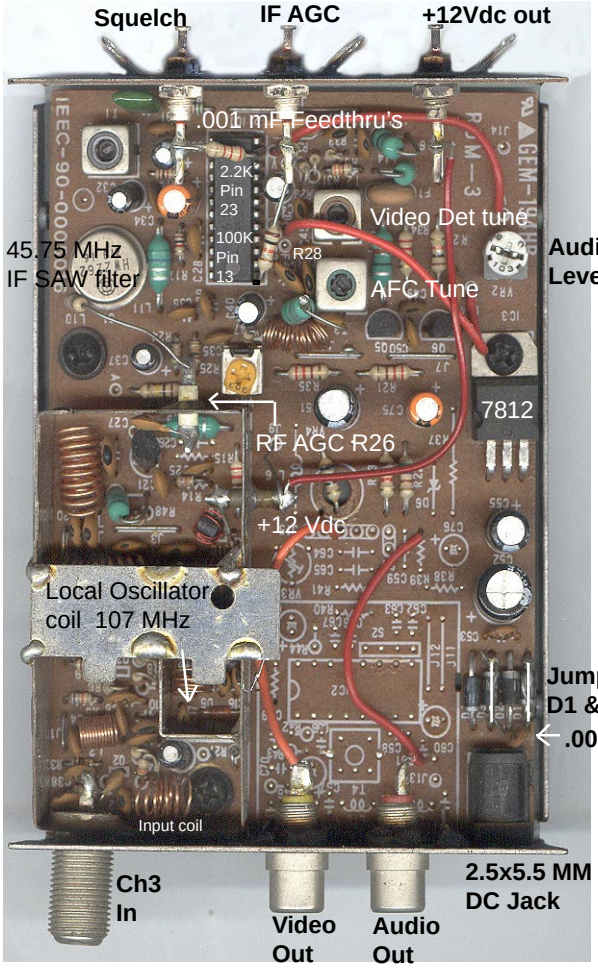
Channel 3 Receiver for ATV Applications

The channel 3 ATV receiver enables getting composite video and line audio output when connected to an ATV downconverter in order to drive a video monitor, camcorder or VCR that only has these inputs. This app note describes how to get the added features of powering with an external 13.8 Vdc for portable or mobile use, S-meter and audio squelch. Using this receiver instead of a TV set eliminates the danger of shock or possible damage if a S-meter or squelch is an attempted addition to a hot chassis TV set.

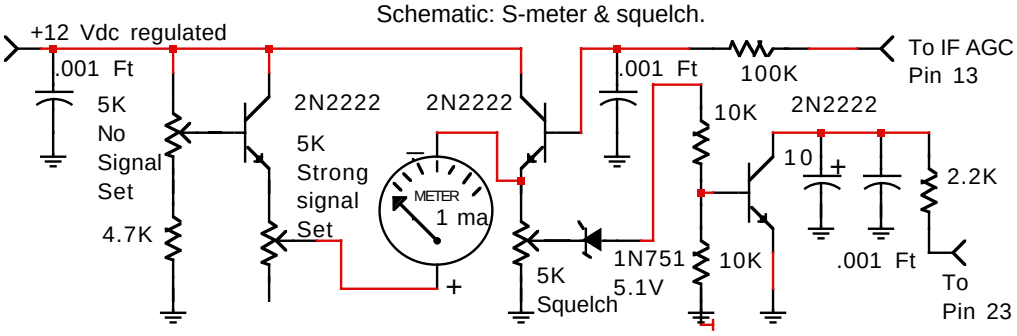
External 13.8 Vdc: Your channel 3 ATV receiver can be easily modified to operate from a 13.8 Vdc power supply rather than from the 16 Vac wall plug power supply that came with it for mobile or portable applications. Remove the cover and find the 4 rectifier diodes near the power connector. Solder a jumper across D1 using one lead of a .001 disc cap. Then jumper D3 with the other lead. This will directly connect the center pin of the 2.5 x 5.5 mm connector to the input of the 7812 12 Vdc regulator IC. Use a 1/2 A fuse in series with your 13.8 Vdc power cord to prevent blowing up the receiver if the leads are connected up backwards. Verify your changes with an Ohm meter before first applying power.



S-Meter: The OSD-SSM video Signal Strength meter board can be connected to this receivers IF AGC pin 13 on the Sanyo LA 7555 IC through a 100K resistor and feed through capacitor. The IF AGC voltage on pin 13 varies from about 11.5 Vdc no signal (depending on downconverter gain) to 7.5 Vdc P5+ signal. External load cannot exceed 300K total on this pin. The leads need to be well bypassed to prevent strong TV RF from getting in. If not interested in the less than P5 signal strengths, you can connect to the end of R26 and get the RF AGC voltage for indicating the P5 and stronger signals.
If you want to use an actual meter, use the schematic below and Radio Shack parts. A 1 ma meter is shown, but any meter of less current can be used as long as a higher value strong signal set pot is used by the same inverse ratio. ie, 100 uA = 50K. If you dont want squelch also, use a 4.7K resistor in place of the 5K squelch pot.

Squelch: The IF AGC can also be used for audio squelch. The IF AGC voltage is negative going from +11.5 volts to +7.5 V. By sensing this level change a transistor connected to pin 23 can be turned off and open the audio. If you dont also want S-meter, eliminate all the parts to the left of the meter. The line audio output can be loaded as low as 500 ohms and VR2 set for as high as 3 Vp-p.

Schematic: S-meter & squelch.



Verify with an ohmeter no adjacent IC pin shorts before applying power.

AFC: There is a dual AFC range of initially +/- 2 MHz that switches down to +/-.8 Vdc. You can monitor the AFC voltage atop resistor R28. When locked, pin 22 has an open collector that goes low which could be connected to a LED thru a resistor to indicate lock. However, if you have a strong channel 2 or 4 in the area, the AFC might try to pull off to its limit when no signal is being received, and not be on frequency when a station comes back on. This is the reason we used feedthru caps for the external S-meter and Squelch circuit. You can either try to better shield the case by scraping the paint under and around the screw heads, etc., or defeat the AFC by grounding pin 14. Grounding pin 14 puts 6.5 Vdc on the AFC line to the local oscillator varicap. You may then have to fine tweak the LO to 107.0 MHz by carefully moving the oscillator coil turns closer or farther away from each other with a plastic tuning tool. The coil is in the smallest shielded can section.

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