

ELECTRONICS

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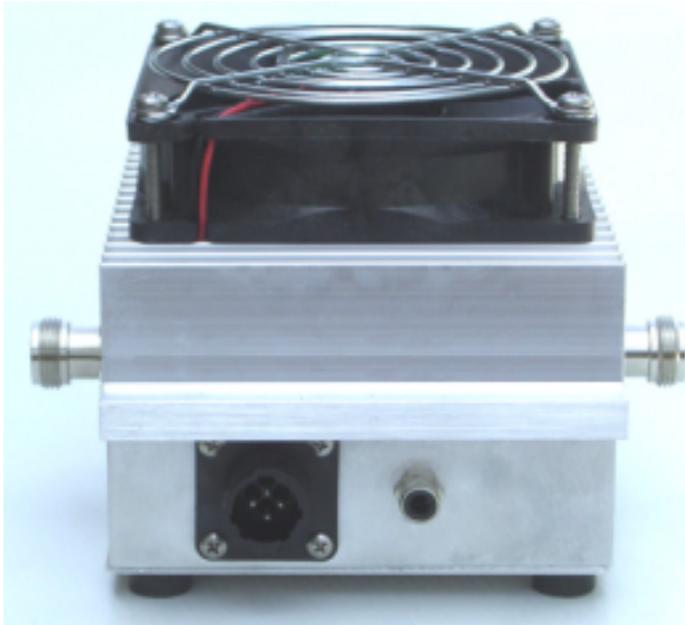
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Downeast Microwave 35 Watt pep 70cm Linear Amp on ATV



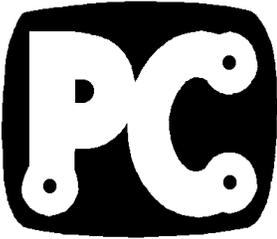
DEMI has a high gain linear amp available in kit (\$160) or built (\$210) form that works great on ATV. It is linear enough and with sufficient gain to output 20 Watts pep from a 60 dBmV rated cable TV modulator. With sync stretching found in our TXA5-70S 50 mW or TXA5-RCb 1W transmitters you can get 35 Watts pep. The kit allows accepting drive and adjustment from 10 mW to 2W with an input attenuator.

This amp runs class AB so it draws about 4 Amps with no drive and up to 8 Amps at full output from a 13.8V regulated supply. However, with the heatsink and fan it runs cool. It does not have a T/R relay built in so you will have to add that externally for inband use with the same 70cm antenna. There is a diode detector to give a relative output indication.

The Toshiba SAU83L power module is very linear and with low intermod at levels below 20 W pep. At 20W the sync compression is about 5 IRE units and increases to 20 IRE - half the sync - at 25 W pep. When driven by a VSB cable modulator, the lower sideband reinsertion was about 20 dB down from the upper sideband at 20 W pep if the bias DC voltage was carefully adjusted for least intermod. This best linearity point was with 3.9 V bias so I left the supplied optional 470 Ohm to ground resistor in after finding the optimum value with a pot.

With our transmitters you can drive this amp all the way up to saturated full pep output with 50 mw but still have the video portion of the waveform in the linear region. With the TXA5-70 transmitter board, adjust the drive with its RF Out pot and use the 100 pF input coupling cap on the amp input. Do the set up procedure with no video connected, pedestal pot full on at CCW, and slowly increase the RF Out pot from full CCW until 33 Watts is reached. This will leave a few Watts headroom for the sound riding on the sync tip. Then set the pedestal pot for 19 Watts.

The 1W TXA5-RCb uses the 50 Ohm load resistor on the amp input and the drive is varied by the amps variable .3-3 pF cap at C1. You need to be careful not to present more than 100 mW to the input pin of the SAU83L. It is difficult to preset C1 for minimum visually, so begin with no video connected to the exciter and the pedestal pot at full off CW. Then slowly increase the pedestal power and as you reach 33 Watts out, adjust C1 to 20 Watts or so. Repeat increasing the pedestal and decreasing with C1 until the pedestal pot is full CCW. Then you can set the max drive to 33 Watts out with C1 and followed by setting the pedestal to 19 Watts.



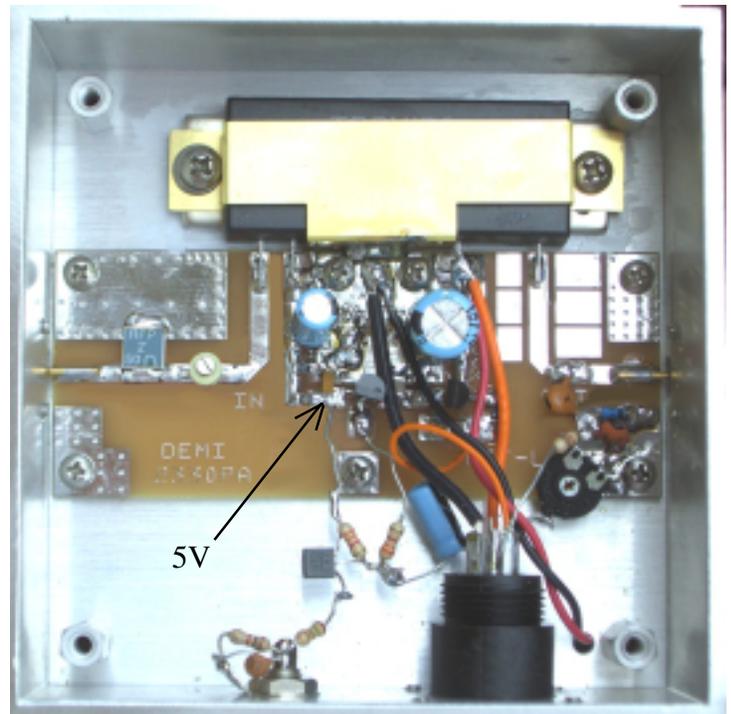
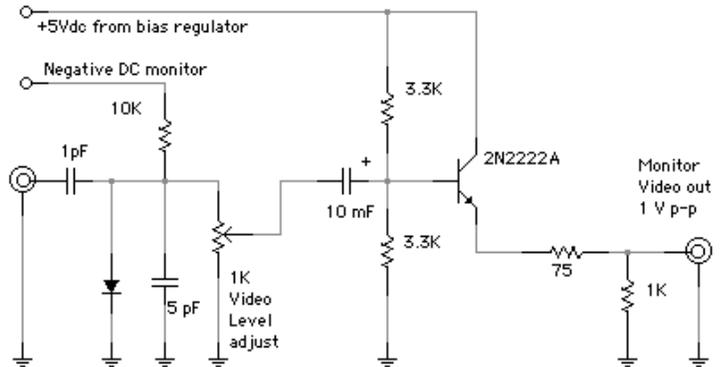
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The amp comes with a diode detector that samples a little RF to give an output power indication. You can calibrate this against a good Wattmeter, but for ATV I suggest changing the circuit to add a video monitor output. There are few parts required and the circuit can use part of the amp board with the rest simply with the wires twisted then soldered together rather than making a separate board. See the photo below. I added a RCA phono jack for the video monitor output.

Once the sync tip peak envelope power and pedestal are set, you can plug in the video to your transmitter and adjust the added 1K pot for 1V peak to peak output into a resistive 75 Ohm load. With this video monitor output, you can then see your actual transmitted picture, fine adjust the camera and video gains. You can also fine adjust the pedestal and amp bias using a scope or waveform monitor.

Use the diode that came with the kit or assembled unit. The cathode side (band) goes to ground. RF is coupled to the diode through a 1 pF disc cap. This cap actually better tunes the output and I got a little more power output. A 4.7 or 5 pF disc cap parallels the detector diode and filters the RF from the video modulation. The 1K video gain pot has its CCW pin soldered directly to the board ground pad in the corner of the board and the CW to the isolated pad with the anode of the diode, 10K power indicator resistor, 1 and 5 pF caps. All parts connected to this pad must be with very short leads. The wiper is bent up to clear the chassis and the negative side lead of the 10 mF coupling cap wrapped and soldered around it.



Parts list - Mouser part numbers

- 1 pF disc cap 140-50N5-1R0D
- 5 pF disc cap 140-50N5-4R7D
- 10 mF elect. cap 140-XRL25V10=RC
- Jack, RCA phono 161-1052
- Pot 1K 531-PT10V-1K
- Resistor 75 Ohm 291-75-RC
- Resistor 1K 291-1K-RC
- Resistor 3.3K 291-3.3K-RC (2)
- Resistor 10K 291-10K-RC
- Transistor 2N2222A 610-PN2222A
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