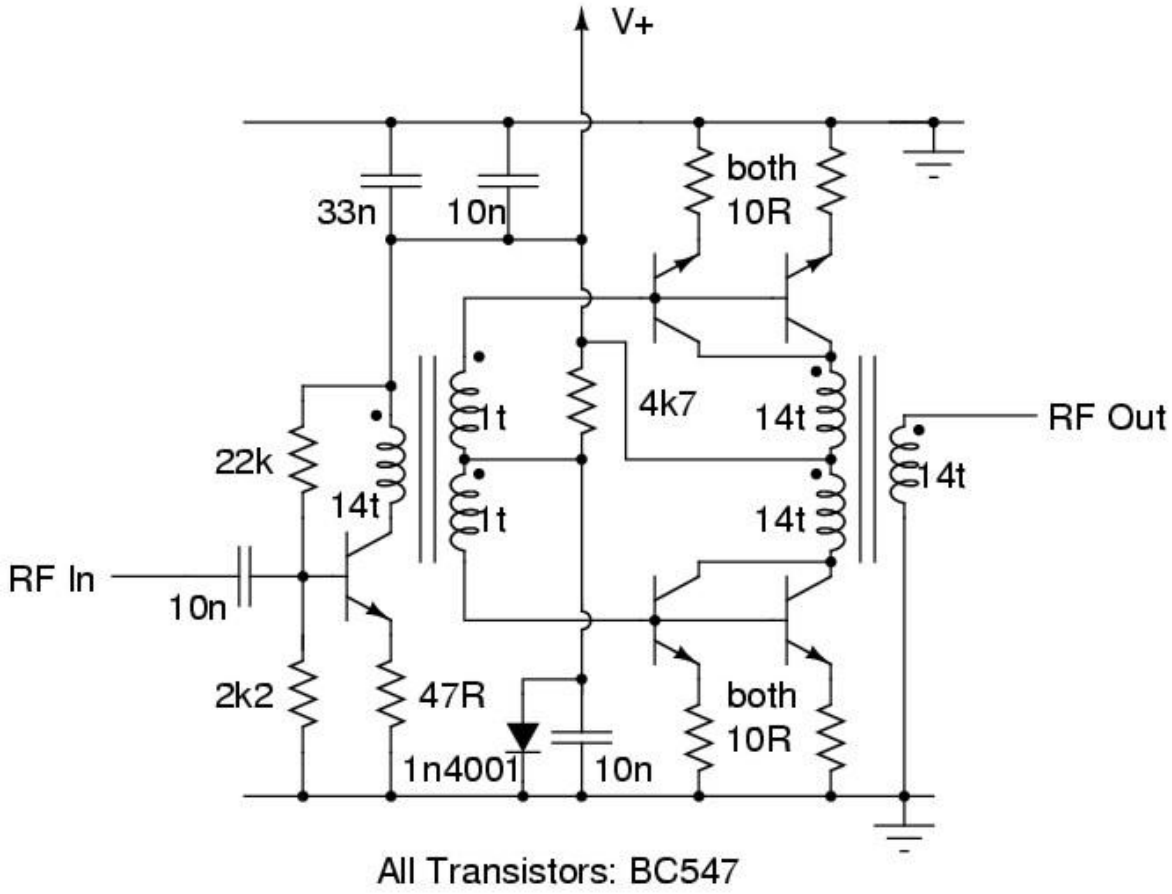
SM0VPO 500mW Linear Amplifier

This is my implementation of SM0VPO's tiny HF linear amplifier. You can find his original page about the design here: Harry's Homebrew Homepages. There is very little to say about the design, except for its amazing robustness under punishing loads and over-voltage supply. Harry recommends a 7:6 output transformer ratio, I used 1:1, still with 14 turns as in his design, it didn't seem to make a lot of difference. My unit is slightly unstable with the lid off operating into an open circuit, but once sealed up it works fine.

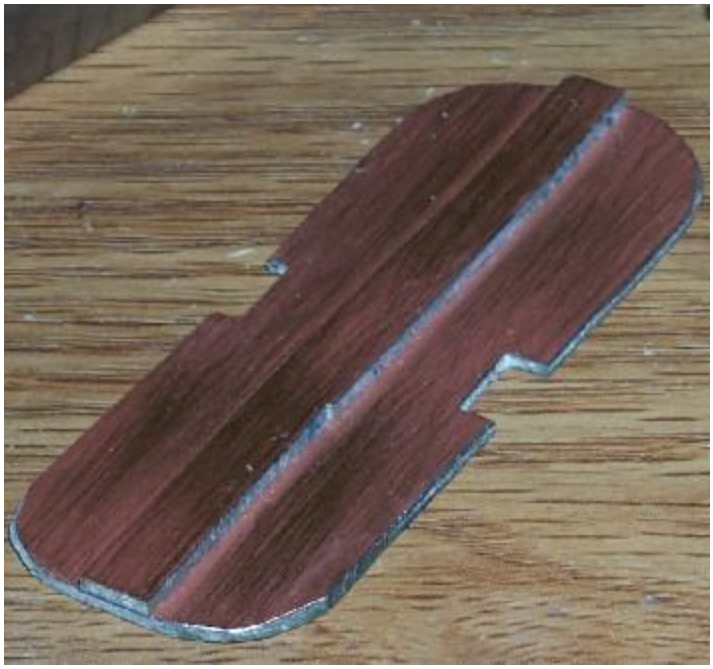


All Transistors: BC547

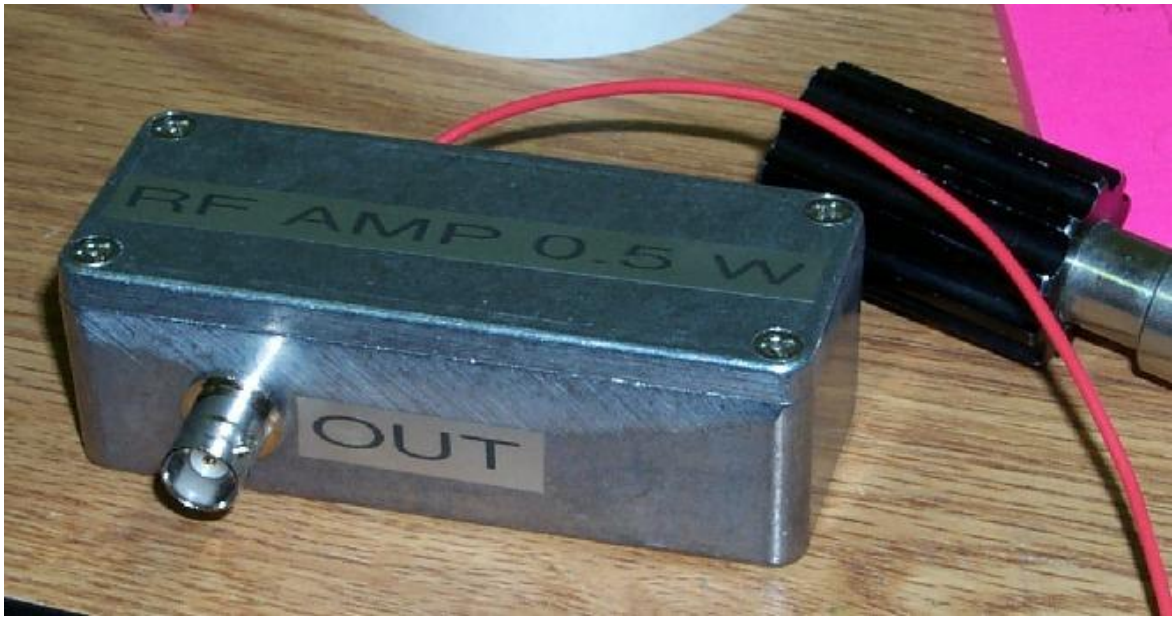
As you can see, the 1/2 watt output (closer to 1 watt can be achieved by abusing the device and running it from 24 volts) is achieved using only garden variety BC547 devices, paralleled in a fairly conventional class-B push-pull circuit. There is more than sufficient drive from my signal generator to drive it into full saturation, but a few turns around my finger slipped over my dipper coil works fine as well (about 27-30 dB gain).

The ferrites I used were junk-box pig-noses, their properties limited the bandwidth of the amplifier to about 1.5 MHz to 25 Mhz, with its peak power output and gain around 10.7 MHz. Unlike Harry's tests of his copy, the output was far from flat, with about 3-6 dB ripple across the 'band'.

The board was assembled in a similar style to Harry's unit. I cut a slab of board to fit the tiny cast aluminium box I had planned to use, and nibbled it carefully to fit all the groves and protrusions inside. I had hoped to put the plugs on each end of the box, but it was not possible due to the lid screw thread casting, so each side sufficed. The power rail runs down the centre of the board, end to end.



The final assembly is actually quite spacious, I over estimated the size of the layout, and the box is mostly empty space, I could have used the square form box which is the same price and offers less internal protrusions. There are more decoupling caps than are shown on the diagram, two on each end of the bus. The lugs for the BNCs make the earthing and mechanical support for the board. The power enters through a small piece of wire, I hope to replace this as soon as I can source some feed-through caps.



The output nicely lights a torch globe with only 13v8 of supply and a few mW of drive from the signal generator. The output is not overly dangerous, basically incapable of seriously burning you even accidentally. It works very nicely as a general purpose RF amp around the bench. Thanks Harry, it's great!

Update: 2007-02-05

I finally fed the power into the amplifier through a feed-through capacitor:

Source: http://www.vk2zay.net/article/04