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Receiver for Jupiter

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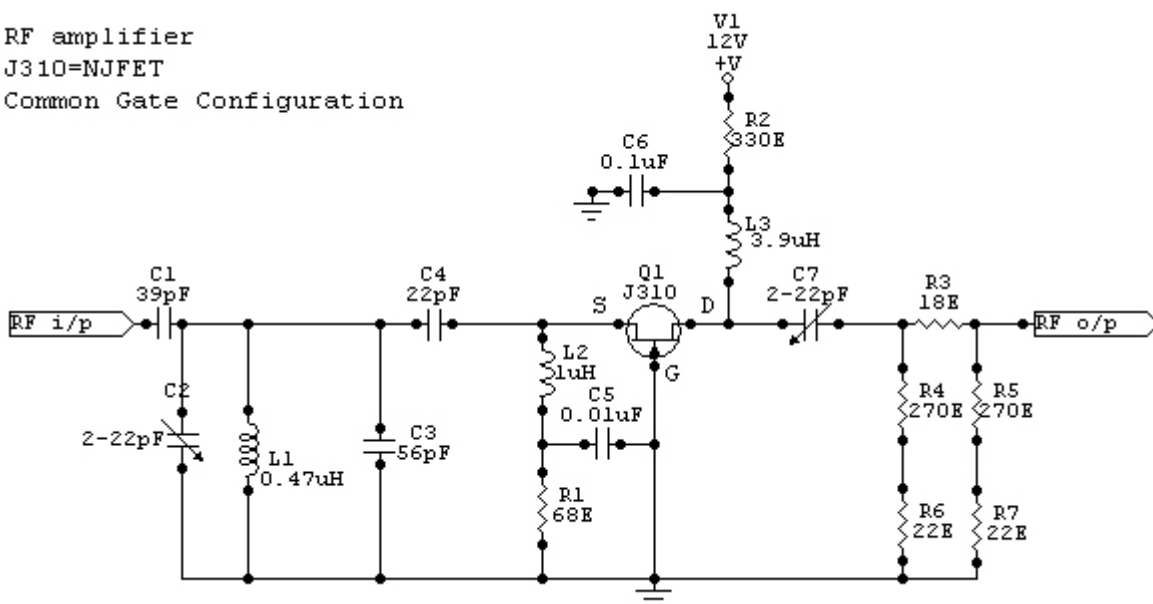
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RF Amplifier

The RF amplifier used in this project is the single stage RF amplifier using N-channel JFET (J310). The JFET is used in common-gate configuration. The common-gate amplifier is often used in high-frequency applications, as its bandwidth is much greater than that of common source amplifier. Another reason for its use is that the circuit configurations offers low i/p impedance, which is convenient for matching to transmission line.

RF amplifier
J310=NJFET
Common Gate Configuration



The i/p tank circuit formed by L1,C2,C3 is used to tune the RF amp. to 20.1MHz. The Pi-attenuator at o/p matches the o/p impedance to 50 ohms. The resistors R1 and R2 are the biasing resistors for JFET. L3 and L2 acts as a Radio Frequency Choke to avoid RF signal to go in to DC power line. The

RF amplifier used after the Narrow band pass filter is same as shown in diagram. So receiver contain two stages of same RF amplifier one before and other after the narrow band pass filter. **The 0.47microH air core inductor is made from #24 gauge insulated copper wire wound on 3mm former giving 22 turns in 1inch.**

Specifications of RF Amplifier: -

1. Gain	9dB
2. VSWR	1.1
3. Noise Figure	3.195dB
4. Noise Temperature	315.17 Kelvin
5. Minimum Discernible signal (BW=3.3KHz)	-133.34dBm
6. 1dB compression point	-12dBm
7. IP3,in	-2.25dBm
8. SFDR	87.39dB
9. Center Frequency	20.1MHz
10. Bandwidth	2MHz

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