

# Initial Draft of SDR, SDN, and Cognitive Radio Literature

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## I. RTL-SDR

The RTL-SDR is a recent tool discovered by the DIY and hacking community. Its original purpose is to be used as a digital TV tuner. However, it was discovered that this system could also be used to general SDR purposes. There is now a large community dedicated to using this tiny SDR to receive various different signals. Prior to the creation of the open source drivers for the RTL-SDR, the most popular devices for SDR came from USRP. The USRP devices are fantastic products, but cost at least \$1,000 and can cost quite a bit more with additional features. The RTL-SDR is based on the Realtek RTL2832U chip. This device can often be purchased for between \$20 and \$30 [?]. The range for the RTL-SDR is typically 64 MHz to 1700 MHz, however this varies depending on which tuner the manufacturer paired with it. The authors in [?] paired the RTL-SDR with a mixer in order to lower the range all the way to DC. For this, they used the NE6062AN chip. Starting with Release 2013b, MATLAB/Simulink now have a support package that targets RTL-SDR devices. In Simulink, the package contains a single block called "RTL-SDR Receiver." This block allows the user to tune the center frequency, change the tuner gain, set the sampling rate, and alter the frequency correction factor. The block can then output the complex envelope (IQ) of the received signal in both floating point and integer formats[?].