Stereophonic Power Line Audio Transmission

Function Description
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Project Description
Both the left and right channels of a line out signal from an audio device will be placed onto a building's power lines by means of a transmitter, and received at a remote location. The receiver will convert the signals into a stereo line out signal, which will be sent to a dual speaker-amplifier combination. This received signal will comply with hi-fi stereo quality standards. In addition to the transmitter and receiver, a blocking filter will be constructed to prevent contamination to and from the community power lines.

Function of Design Based on the Inputs and Outputs

Transmitter
The transmitter will receive a line out signal from an audio device. The transmitter will then modulate the signal and send it to the power lines. The exact method of modulation to be used is yet to be determined. Each channel of audio (left and right) will be assigned a separate carrier frequency and then “shifted” to a higher frequency location to avoid the 60Hz AC signal that is on the power lines.
- Input – line out from audio device
- Output – modulated audio signal to power line (outlet)

Receiver
Using filters to extract each signal from the power lines, the receiver will demodulate the signals. The demodulated signals will then be restored to line out specifications. These signals will then be sent to external amplifiers, or possibly to an onboard amplifier that can directly power speakers.
- Input – modulated audio signal from the power line (outlet)
- Output – line out signal

Blocking Filter
This component will prevent our audio signal from leaking onto the community power lines.
- Input – Power line with modulated audio signal
- Output – Pure 60Hz 120V power signal

Modes of Operation
The two modes of operation of the system are:
On
Off
Figure 1: High Level Block Diagram of System