

# Electronics Online Challenge Sponsored by Texas Instruments

Team: 10470W School: Oak Mountain Middle School, Birmingham, Alabama, USA



(A picture of the radio before we took it apart)



(Taking the radio apart was not easy – there were several types of waterproofing material that made it difficult to take apart.)

Our electronic device is a Brookstone AM/FM shower radio. The reason we picked this device is because it was old, and had a few nobs on it. We also wanted to know what was inside a radio and how it works.

**Summary:** We found the following components inside the radio.  
On and Off switch – Turns the radio ON and OFF and controls the volume to the speaker.

FM antenna – It receives signals from local radio stations.

Tuning capacitor – It tunes the audio signal from station to station.

AM/FM switch – The switch that changes audio signal from the AM band to the FM band.

Ceramic AM/FM filters – They filter out unwanted signals from the audio files.

Battery compartment – It holds the four (4) AAA batteries in place.

AM antenna – It receives signals from local radio stations.

AM transmitter – This item cleans up the audio signal and moves it to the Tuning Capacitor.

FM bandpass filter – It prevents out-of-band energy from corrupting the audio signal and moves it to the Tuning Capacitor.

Power leads – Transfers the electricity from the batteries to the system's components.

Single speaker – It projects the the sound that the system provides.

Chip – It controls all functions of the system- manufacture unknown.

FM discriminator – It translates the radio signal into an audio formatted signal.

**No items were labeled as Texas Instrument components.**

(A layout of the components is displayed on the following page)

What I learned: I learned that a radio has a lot of parts that deal with the AM and FM bands. I had to ask my dad what an AM band was, because I never listen to the AM stations. I learned what the on and off switch looks like on the inside and how it is connected to almost everything. I read how there is a lot of trash signals in a radio wave and the ceramic filters remove those unwanted signals from the final audio signal. I saw some online videos that showed how radio waves have height and width and how their bandwidth can change – it was very interesting.

# Layout of the Radio and its internal components

