



# Understanding and Improving Your Station Audio

CAN YOU HEAR ME NOW?

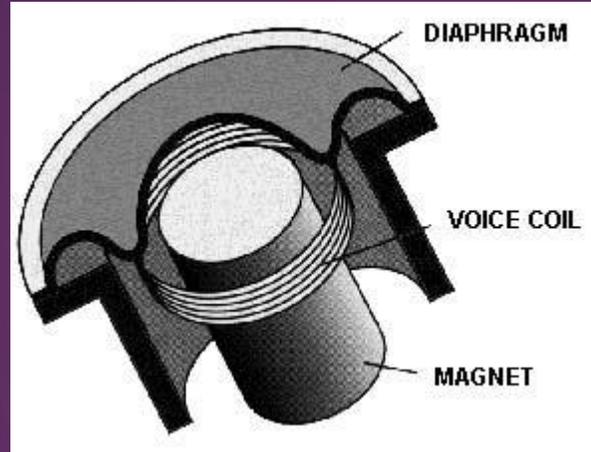
# So much to talk about, so little time

- ▶ Microphones
- ▶ Outboard Audio Gear
- ▶ Sharing Audio Resources
- ▶ Matching Audio Impedance/Levels
- ▶ EQ, Reverb, Compression, and Limiting
- ▶ Big Dollar DSP Speakers

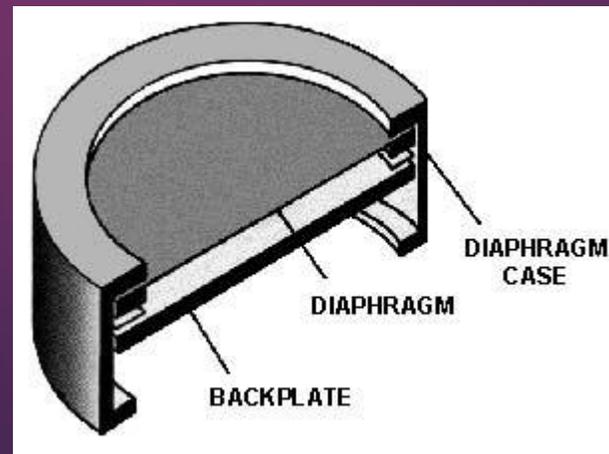
# Microphones

- ▶ Types

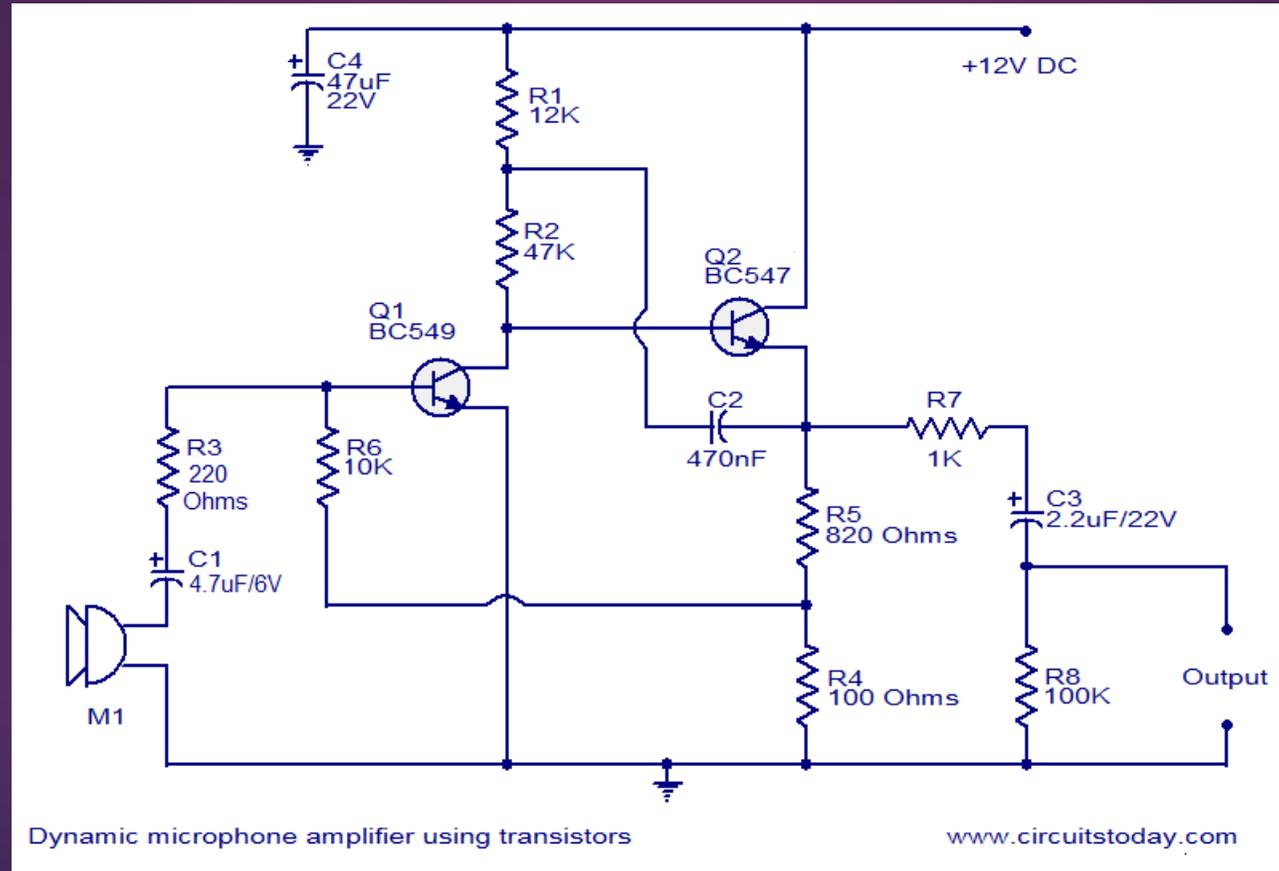
- ▶ Dynamic



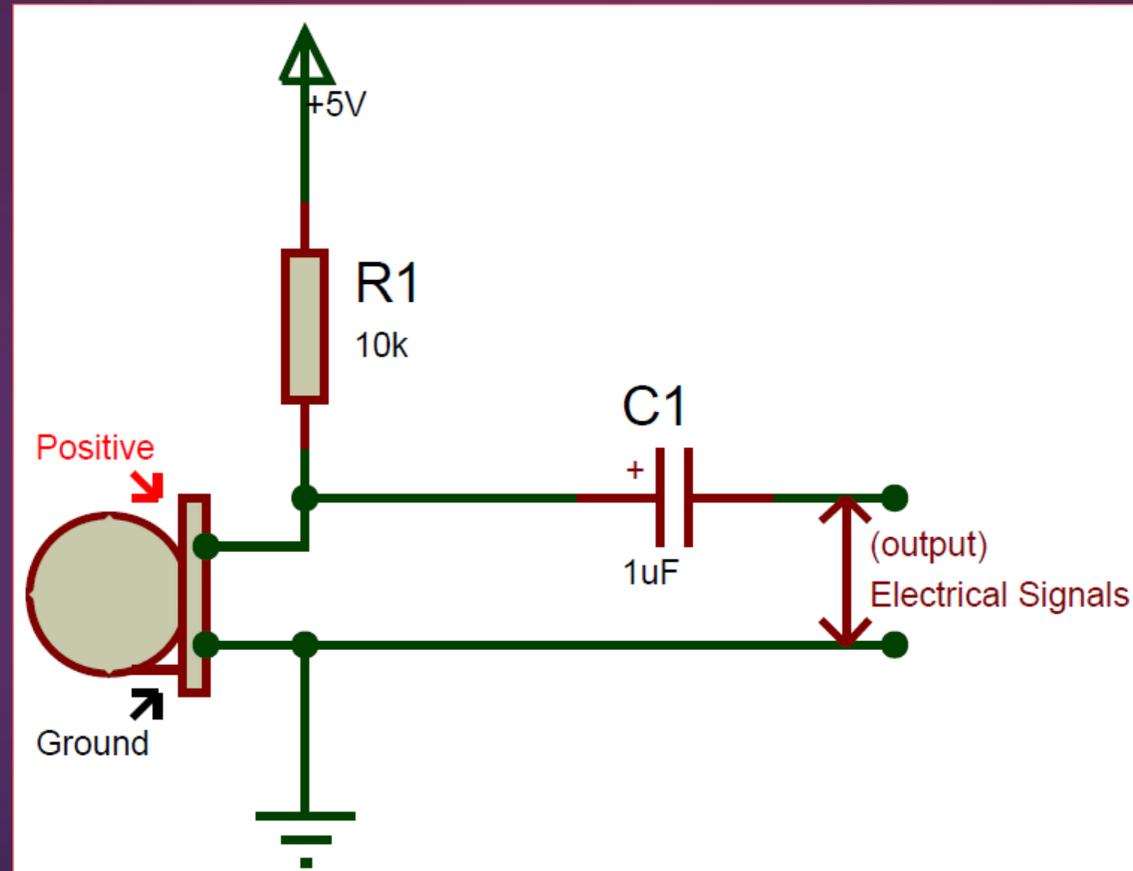
- ▶ Condenser/Electret



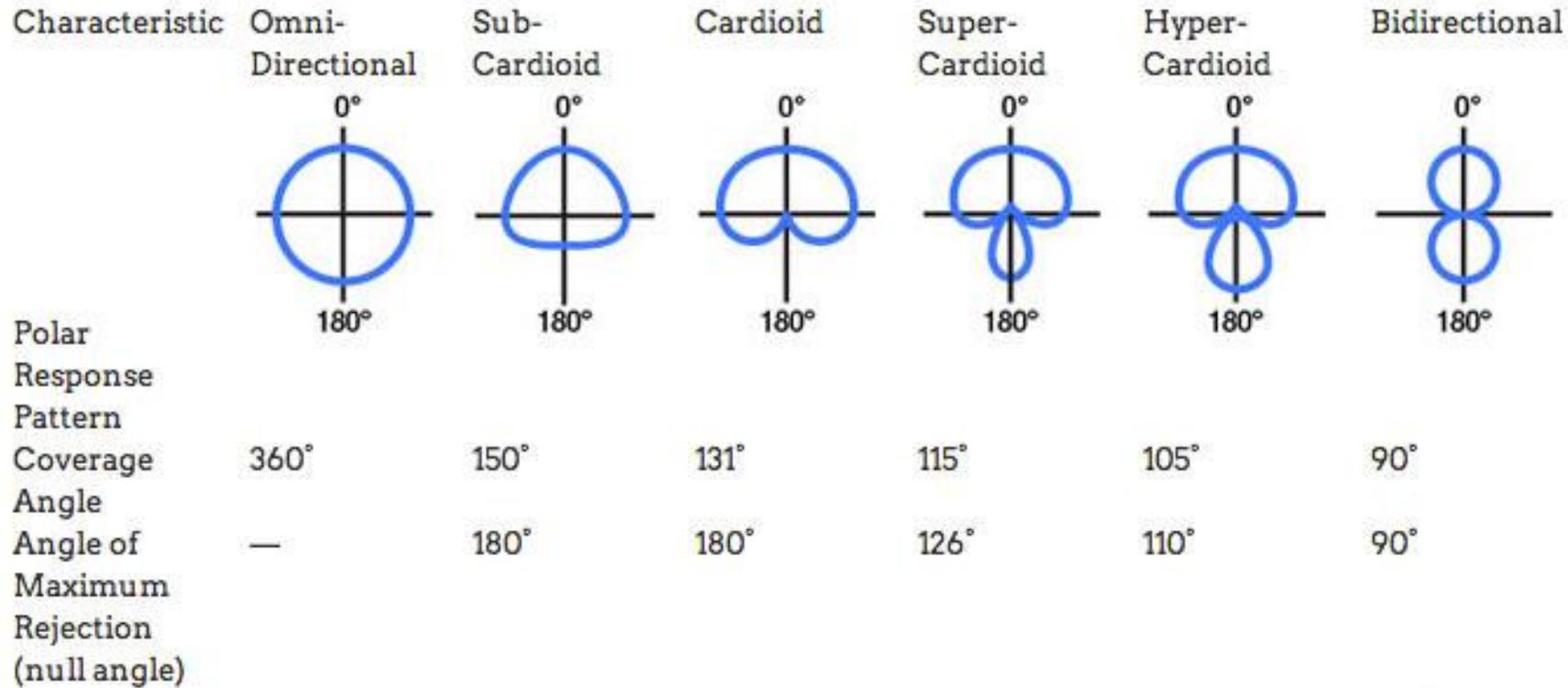
# Typical pre-amp for a dynamic mic



# Typical circuit for an electret mic



# Response patterns for microphones



*MORE REJECTION* →

# What mic do I use?

- ▶ Shure SM-58
- ▶ AKG Perception Wireless Sport Set



# Outboard audio gear

- ▶ Yes, some guys have actually done this.

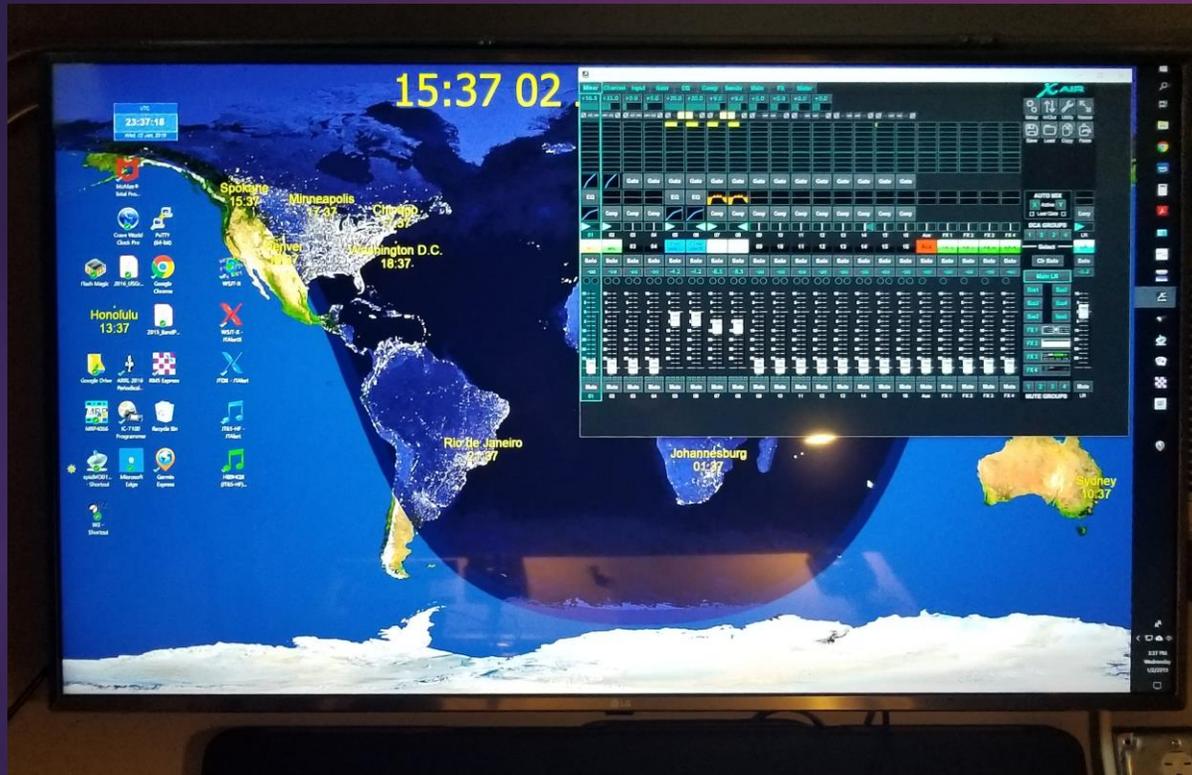


# Outboard audio gear that might actually be useful

- ▶ A mixer (with basic audio shaping tools)



# What it looks like in my shack



# Channel Detail



# Sharing audio resources

## ► W2IHY iPlus



# Matching impedance and levels

- ▶ Audio impedance levels are not terribly important
- ▶ Levels just need to be where you can keep every gain setting at a reasonable level without asking any one piece in the string to operate at its extreme

# EQ, reverb, compression, and limiting aka audio shaping

- ▶ EQ depends on what you're trying to accomplish
- ▶ No reverb! Never!
- ▶ Compression needs a light hand
- ▶ Typically use compression instead of limiting

# EQ example for a rag chewer

The image shows a computer monitor displaying a digital audio workstation (DAW) interface. The desktop background is a world map with city names and times: Spokane 16:46, Minneapolis 17:46, Chicago 17:46, Denver 17:46, Washington D.C. 18:46, Rio de Janeiro 21:46, Johannesburg 01:46, and Sydney 10:46. A large yellow digital clock in the top center of the screen displays "15:46 02".

The DAW interface includes a mixer window with a frequency response curve (EQ) for a "Rag" channel. The EQ window shows a graph with a peak at approximately 2.0 kHz. Below the graph, there are controls for EQ mode, gain, frequency, and quality. The EQ window also displays a table of filter settings for various frequency bands.

Band	Gain	Q	Low Cut	High Cut
01	0.0	1.0	0.0	20.0
02	0.0	1.0	0.0	20.0
03	0.0	1.0	0.0	20.0
04	0.0	1.0	0.0	20.0
05	0.0	1.0	0.0	20.0
06	0.0	1.0	0.0	20.0
07	0.0	1.0	0.0	20.0
08	0.0	1.0	0.0	20.0
09	0.0	1.0	0.0	20.0
10	0.0	1.0	0.0	20.0
11	0.0	1.0	0.0	20.0
12	0.0	1.0	0.0	20.0
13	0.0	1.0	0.0	20.0
14	0.0	1.0	0.0	20.0
15	0.0	1.0	0.0	20.0
16	0.0	1.0	0.0	20.0
Aut	0.0	1.0	0.0	20.0
FX1	0.0	1.0	0.0	20.0
FX2	0.0	1.0	0.0	20.0
FX3	0.0	1.0	0.0	20.0
FX4	0.0	1.0	0.0	20.0
Main LR	0.0	1.0	0.0	20.0



# Big dollar DSP speakers

- ▶ If the rest of your circuitry is designed for a flat response, you only need to do audio shaping at one place in the chain.
- ▶ In fact, shaping audio at two or more places can quickly and easily create mush.

# Summary

- ▶ Modern transceivers have the ability to shape sound that is adequate for what we typically need as ham radio operators
- ▶ If you add outboard gear, only shape audio one place in the chain
  - ▶ Keep frequency response of every other component as flat as possible
- ▶ Keep every stage in the chain operating well within the range of its design
- ▶ Take a light hand with compression

# Summary (cont'd)

- ▶ Feed your radio an audio level for which it is designed
- ▶ Ham specific audio gear is typically pricey and limited in its functionality; pro audio gear is much more versatile and much less expensive
- ▶ Experiment and play with different audio shaping on the air with someone who knows your voice

Questions?

