

# SSB vs FM - WHAT'S THE DIFFERENCE?

Today, N5XO explains why SSB has the advantage over FM!

**THE FM HAMSTER**  
(Loud but Limited)



**CQ CQ CQ**  
ANYBODY OUT  
THERE?!

**N5XO HAMSTER**  
(Calm, Cool, and Efficient)



...YOU DON'T  
NEED TO YELL...  
YOU NEED  
EFFICIENCY.

TODAY'S LESSON:  
Why **SSB**  
has the  
**ADVANTAGE**  
over **FM**!

**FM STYLE:**

- Easy to use
- Sounds great locally
- But... not built for distance
- Wastes power

**SSB STYLE:**

- More efficient
- Uses power where it counts
- Works weak signals
- Built for distance



THEY'RE BOTH  
RADIOS...  
WHY DOES ONE  
SOUND... SMARTER?



**NOT ALL WATTS ARE CREATED EQUAL.**



**OUR GOAL:**

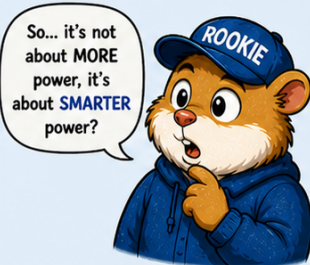
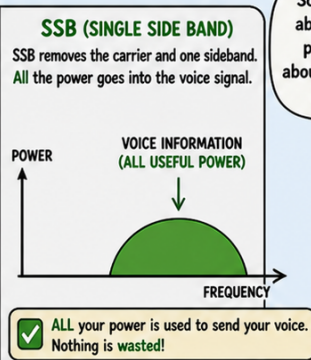
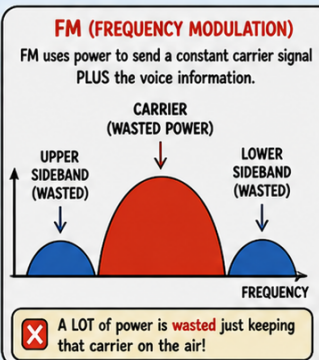
Understand why SSB wins when it comes to range, efficiency, and performance!

# POWER EFFICIENCY - THIS IS THE BIG ONE!

Very simply: SSB uses your power better!



The biggest advantage of SSB over FM is how **power** is used.



So... it's not about MORE power, it's about **SMARTER** power?



Think of it like this... **FM** is like towing a trailer (full of wasted power). **SSB** is like a sports car (all power, no drag)!



So with SSB... my 100 watts actually **GOES** somewhere!



**THE BOTTOM LINE:**  
SSB puts nearly 100% of your power into the signal. FM wastes up to 2/3 of your power on the carrier and extra sideband.

- MORE EFFICIENCY =**
- ✓ Stronger signal
  - ✓ More range
  - ✓ Better performance
  - ✓ Same power!

**REMEMBER:**

On SSB, every watt talks.  
On FM, most of it just **sits there** and looks pretty!



Efficiency always wins!

**SSB = SMART POWER. FM = WASTED POWER.**

# RANGE COMPARISON - SAME POWER, BIG DIFFERENCE!

SSB goes the distance... FM stays close to home.



**FM (FREQUENCY MODULATION)**  
Great for local chatting!

Typical FM Range  
5 - 15 miles

FM is affected more by terrain, noise, and has a limited range.

**SSB (SINGLE SIDE BAND)**  
Built for distance!

Typical SSB Range  
50 - 300+ miles (or more!)

SSB uses power efficiently and can work around obstacles and over much greater distances.



## REAL WORLD EXAMPLE:

Two stations. Same band. Same power (100 watts). Same antennas. Different modes.

**FM QSO:**  
You're talking to Bill in the next county. About 12 miles away.

12 miles

**SSB QSO:**  
You're talking to Joe three states over. 192 miles away!

192 miles

That's the power of efficient communication!  
SSB gets your signal out farther for the same watts!

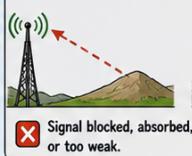


### Why It Works:

- SSB puts ALL the power into the voice.
- Less wasted power = lower noise floor.
- Better signal-to-noise ratio.
- Works better over mountains, water, and rough terrain.

Same power, way better results!

### FM: Local



### SSB: Gets Around!



### Bottom Line:

When Distance Matters... SSB Delivers!

No wonder all the long distance operators use SSB! Let's get on and start working the world!



SSB = LONG RANGE PERFORMANCE • FM = SHORT RANGE CONVENIENCE

# NOISE & WEAK SIGNALS - SSB HEARS WHAT FM CAN'T!

When signals get weak, this is where SSB shines!



**FM (FREQUENCY MODULATION)**  
FM has a "capture effect." It sounds great... UNTIL it doesn't!

Strong Signal (Great audio) | Drops below threshold... then NOTHING!

FM is "all or nothing." When the signal gets weak, it drops off a cliff.

**SSB (SINGLE SIDE BAND)**  
SSB doesn't capture... it's linear. You can still hear (and understand) weak signals.

Gets weaker... but still readable! | Still there! You can copy it!

SSB lets you pull voices out of noise that FM will NEVER hear.



Real operators use SSB because it works when FM gives up!

### SEE THE DIFFERENCE?

**FM RECEIVER**

Strong = Great  
Weak = Gone (Full quieting or nothing!)

**SSB RECEIVER**

Strong = Great  
Weak = Audible (Scratchy maybe... but readable!)

Think of it like this:  
FM is like a light switch.  
SSB is like a dimmer switch.

## REAL WORLD EXAMPLE:

**FM Contact:**  
"Roger Bill, you're 5 by 9..."  
...then fades...  
...then GONE.

**SSB Contact:**  
"Roger Bill, you're 5 by 9..."  
...fades...  
...gets noisy...  
...but still copyable!

## WHY IT MATTERS:

- You can work weaker stations
- More contacts
- More distance
- More fun!

SSB = HEAR MORE, WORK MORE, HAVE MORE FUN!



When the band gets noisy... SSB gets it done!



REMEMBER:



FM HEARS LOUD (or nothing)



SSB HEARS SMART (even when weak)



BETTER HEARING = BETTER CONTACTS!



SSB WINS AT WEAK SIGNALS!

# ANTENNAS & POLARIZATION - SMALL DETAIL, BIG ADVANTAGE!

SSB uses horizontal polarization. FM uses vertical. Here's why it matters!



**FM: VERTICAL POLARIZATION**

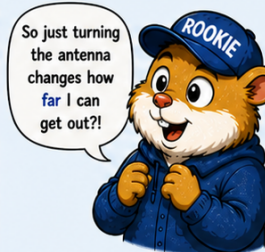
- Vertical antenna sends the signal up and down.
- More ground wave absorption and noise.

Good for local communication... not ideal for long distance.

**SSB: HORIZONTAL POLARIZATION**

- Horizontal antenna sends the signal out parallel to the ground.
- Less noise pickup. More distance. Better performance.

Built for distance and weak signal work. This is how long distance is done!



## WHY HORIZONTAL WORKS BETTER (ESPECIALLY ON VHF/UHF):

**BETTER TAKEOFF ANGLE**

Horizontal antennas launch the signal at a lower angle, ideal for long distance.

**LESS NOISE PICKUP**

Horizontal polarization picks up less noise from local sources like power lines, engines, and electronics.

**BETTER MATCH**

Most long distance operators use horizontal antennas. You match polarization for the strongest signals!

**MORE GAIN OPTIONS**

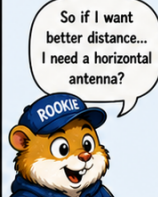
Horizontal antennas (openings like Yagis and beams) offer higher gain for more range.

**PRO TIP FROM N5XO:**

If you want to work the world... use horizontal polarization, a good antenna, and good operating habits!

**REMEMBER:**

- Horizontal gets farther.
- Horizontal is quieter.
- Horizontal is how the pros do it!



**COMMON SETUPS:**

<p><b>FM SETUP</b></p> <p>Vertical antenna (whip, vertical collinear)</p> <p>Great for repeaters and local nets!</p>	<p><b>SSB SETUP</b></p> <p>Horizontal antenna (Yagi, beam, or horiz. dipole)</p> <p>Built for DX and weak signal work!</p>
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**REMEMBER:**

- Horizontal gets farther.
- Horizontal is quieter.
- Horizontal is how the pros do it!

## ★ POLARIZATION MATTERS. HORIZONTAL WINS. ★

Better antenna. Better signal. Better contacts. That's the SSB advantage!



# THE BOTTOM LINE - SSB JUST DOES MORE!

Same radio. Same band. SAME POWER. But SSB gets the job done!



FM (FREQUENCY MODULATION)	FEATURE	SSB (SINGLE SIDE BAND)
Wastes power on the carrier and both sidebands.	<b>POWER EFFICIENCY</b>	Uses 100% of your power for voice.
Best for short range (local contacts).	<b>RANGE</b>	Designed for long distance (100+ miles and beyond).
Capture effect - sounds great until it drops off completely. ...GONE!	<b>WEAK SIGNALS</b>	You can copy weak, noisy signals that FM can't even hear. 
Uses vertical antennas. More noise, less performance.	<b>ANTENNAS &amp; POLARIZATION</b>	Uses horizontal polarization. Quieter, more gain, better match.
Easy and simple. Great for beginners and local use.	<b>OPERATING STYLE</b>	Takes a little practice... but opens the door to the world!
Good for LOCAL. Convenient and simple.	<b>BOTTOM LINE</b>	Built for DISTANCE. Efficient, effective, and unbeatable.



**N5XO SAYS:**

If you want to talk around the corner... use **FM**.

If you want to talk **AROUND THE WORLD...** use **SSB**.



- WHAT YOU GET WITH SSB:**
- More range
  - More contacts
  - More capability
  - More adventure
  - More satisfaction!



**ROOKIE'S TAKEAWAY:**

I learned today:

- SSB uses power better
- SSB goes farther
- SSB works weak signals
- SSB uses horizontal antennas
- SSB = real ham skill!

**I'M GOING SSB!**

**FINAL WORD FROM N5XO:**

FM is fine for talking nearby... SSB is how we talk anywhere."

**REAL RANGE STARTS WHERE FM STOPS.**

SSB ISN'T JUST AN OPTION... IT'S PART OF WHAT MAKES YOU A GREAT HAM!

# FINAL SUMMARY – WHY SSB IS THE WINNER!

Same band. Same power. But SSB goes the distance!



Let's wrap it all up! Here's why SSB is the clear winner!

**THE BOTTOM LINE:**

SSB gets your signal where it needs to go... whether it's across town or across the country!



**FM (FREQUENCY MODULATION)**

- ❌ Wastes power on the carrier and both sidebands.
- ❌ Shorter range – good for local, not long distance.
- ❌ Capture effect – sounds great until it's gone!
- ❌ Vertical antennas – more noise, less performance.
- ❌ Better for casual, local chatting.
- ❌ Simple – plug and play.

**FM IS EASY... BUT HAS LIMITS.**

**SSB (SINGLE SIDE BAND)**

- ✅ Uses 100% of your power for voice. Super efficient!
- ✅ Long range – built for serious distance (100+ miles and beyond).
- ✅ Works weak signals others can't even hear.
- ✅ Horizontal antennas – quieter, better gain, better match.
- ✅ Built for real communication and tough conditions.
- ✅ Takes practice – but opens the door to the world!

**SSB IS SMART... AND GOES FAR!**

SSB wins on RANGE, POWER, and PERFORMANCE!



**N5XO'S FINAL WORD:**

"FM is fine for talking nearby. But if you want to talk ANYWHERE... SSB is the way!"



**REAL WORLD EXAMPLE – SAME RADIO, SAME BAND, SAME POWER (100 WATTS)**

**FM CONTACT:**  
Local QSO with Bill  
12 miles away

Great for local! But the signal doesn't go much farther.

**SSB CONTACT:**  
DX QSO with Joe  
214 miles away!

Clear, solid copy – because SSB gets the job done!

**YOU DECIDE!**

Easy and local? Use FM.  
Long and exciting? Use SSB.  
But when the signal gets weak and the distance gets long...

**SSB IS THE ANSWER!**



## REAL RANGE STARTS WHERE FM STOPS.

I'm going to 144.200!

Welcome to the real side of radio! 😊

