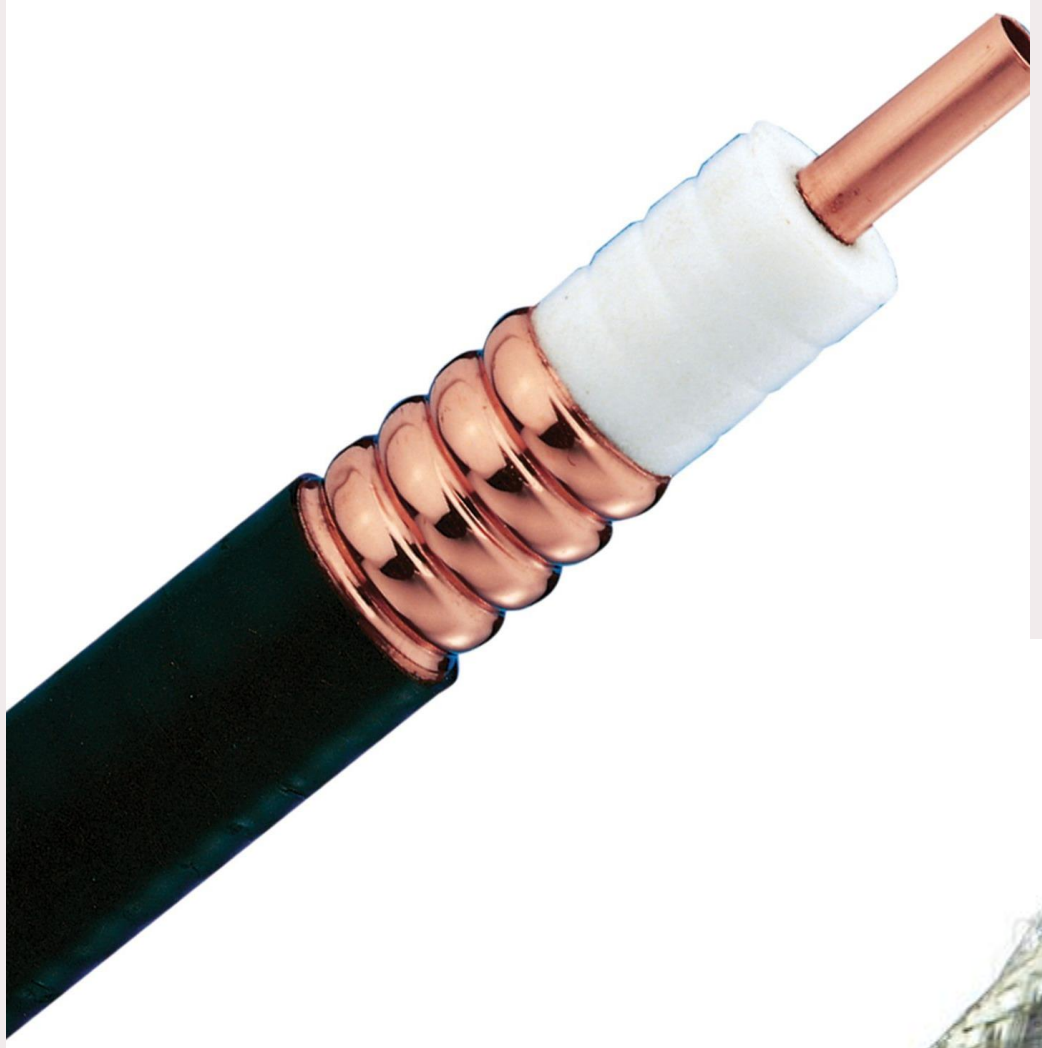
WHAT TYPE OF FEEDLINE SHOULD I USE?



AGENDA

Introduction

Types of Feedlines

Recommended Use

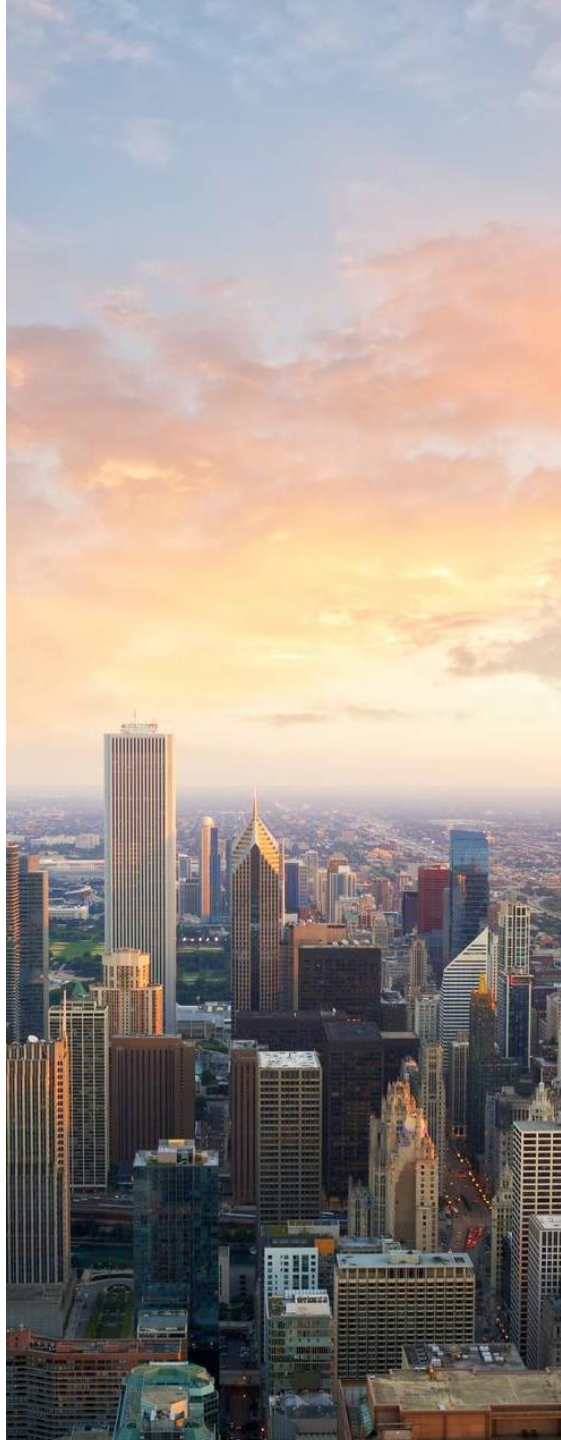
Attenuation Loss

Power Capacity

Shielding

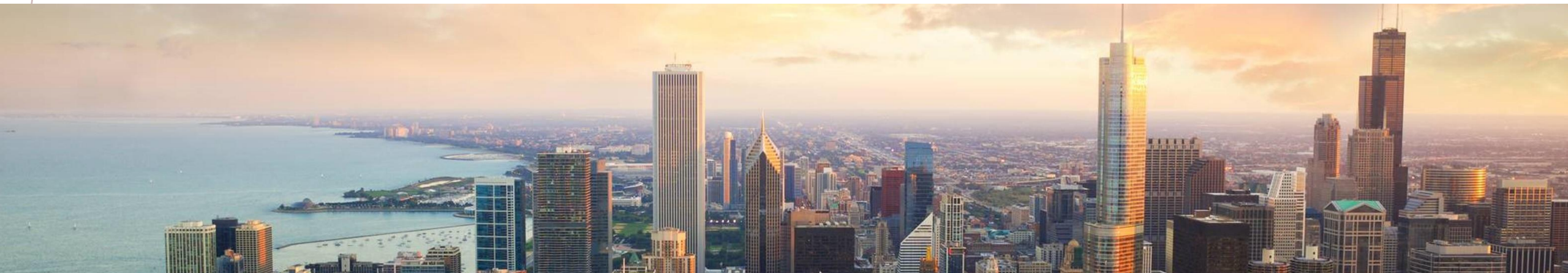
Recommended Manufacturers

Final Tips & Takeaways



TYPES OF FEEDLINES

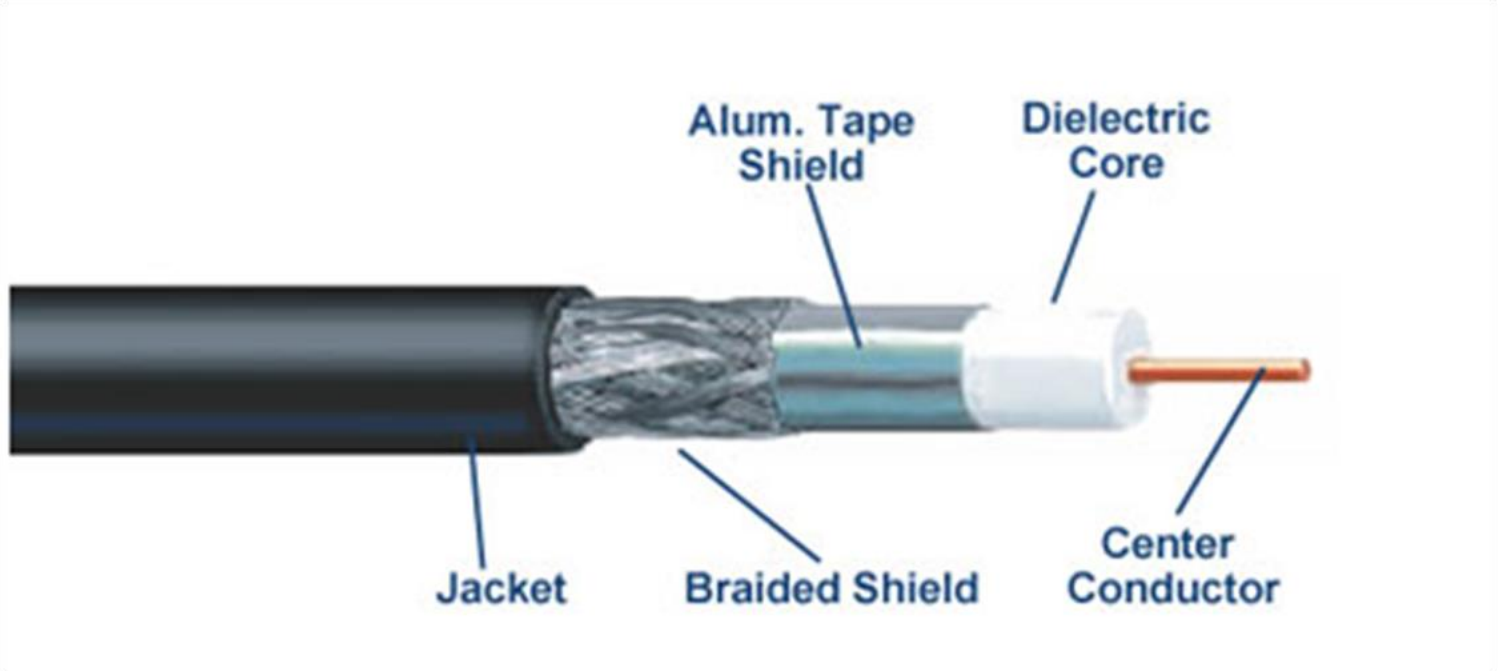
COAX
BALANCED LINE
WAVEGUIDES



COAX

COAXIAL CABLE, OR COAX (PRONOUNCED / ˈKOʊ.ÆKS /),

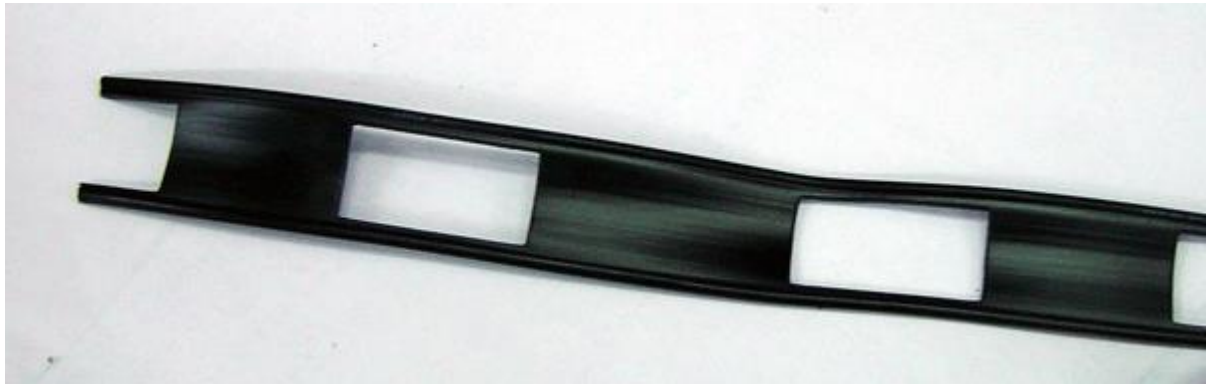
IS A TYPE OF ELECTRICAL CABLE CONSISTING OF AN INNER CONDUCTOR SURROUNDED BY A CONCENTRIC CONDUCTING SHIELD, WITH THE TWO SEPARATED BY A DIELECTRIC (INSULATING MATERIAL);
MANY COAXIAL CABLES ALSO HAVE A PROTECTIVE OUTER SHEATH OR JACKET.



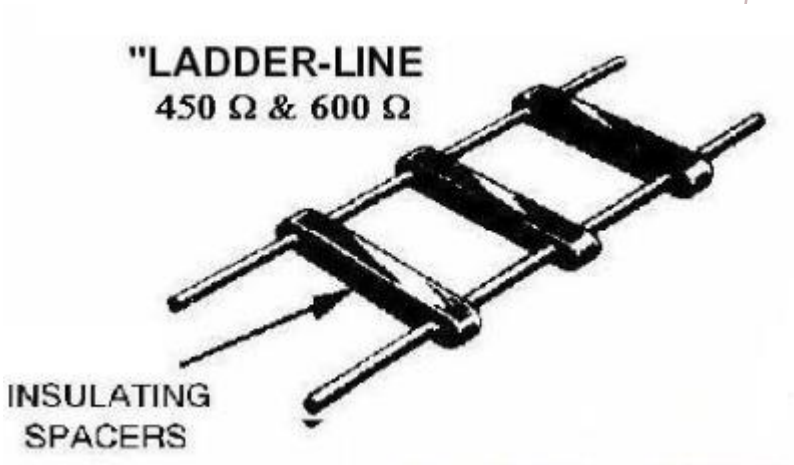
Foil/Braid Shield Coaxial Cable

BALANCED LINE

- 450 Ohm “Ladder Line”



- 300 Ohm “Twin Lead”



WAVEGUIDES

Used for Microwave frequencies ~1Ghz and up

RECOMMENDED USE

COAX

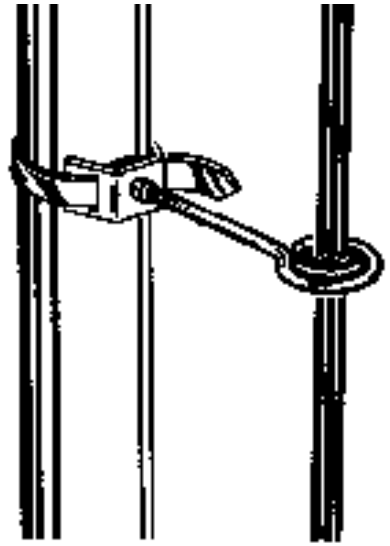
General use feedline

- Can be taped to tower legs
- Can run along other coax
- Used in mobile applications
- 50 Ohms for Most Amateur use

LADDER LINE

Good for HF use

- Can NOT be taped to tower legs
- Must not be run along any metal, use standoffs
- Low Loss

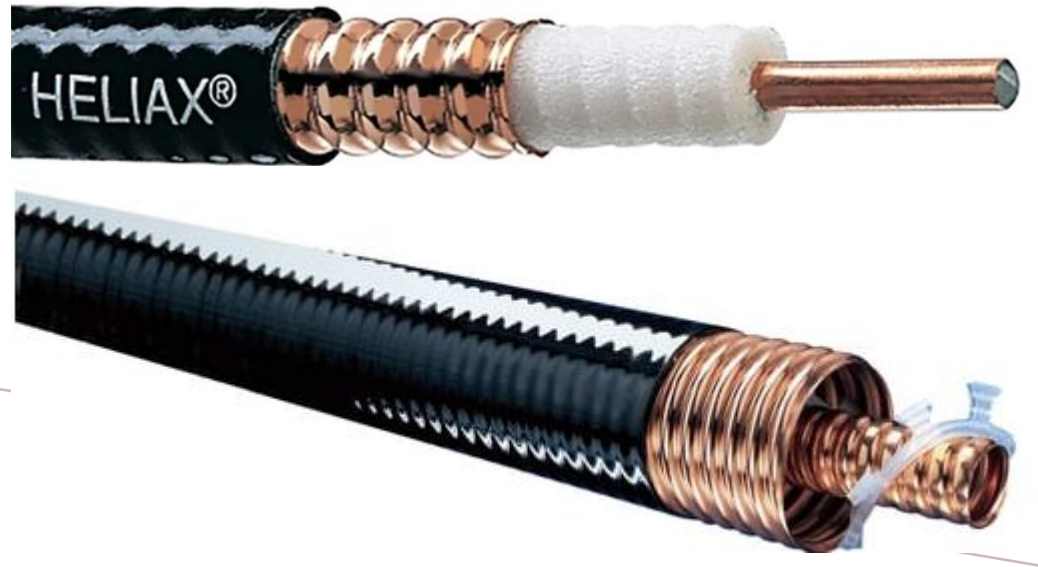


RECOMMENDED USE

HELIAX®

Permanent Installations

- Low Loss
- Good for VHF and up
- May have foam or air dielectric



HARDLINE

Permanent Installations

- Not very flexible compared to Heliax
- Some cable companies throw away "short" runs that could be useful (75 ohm)

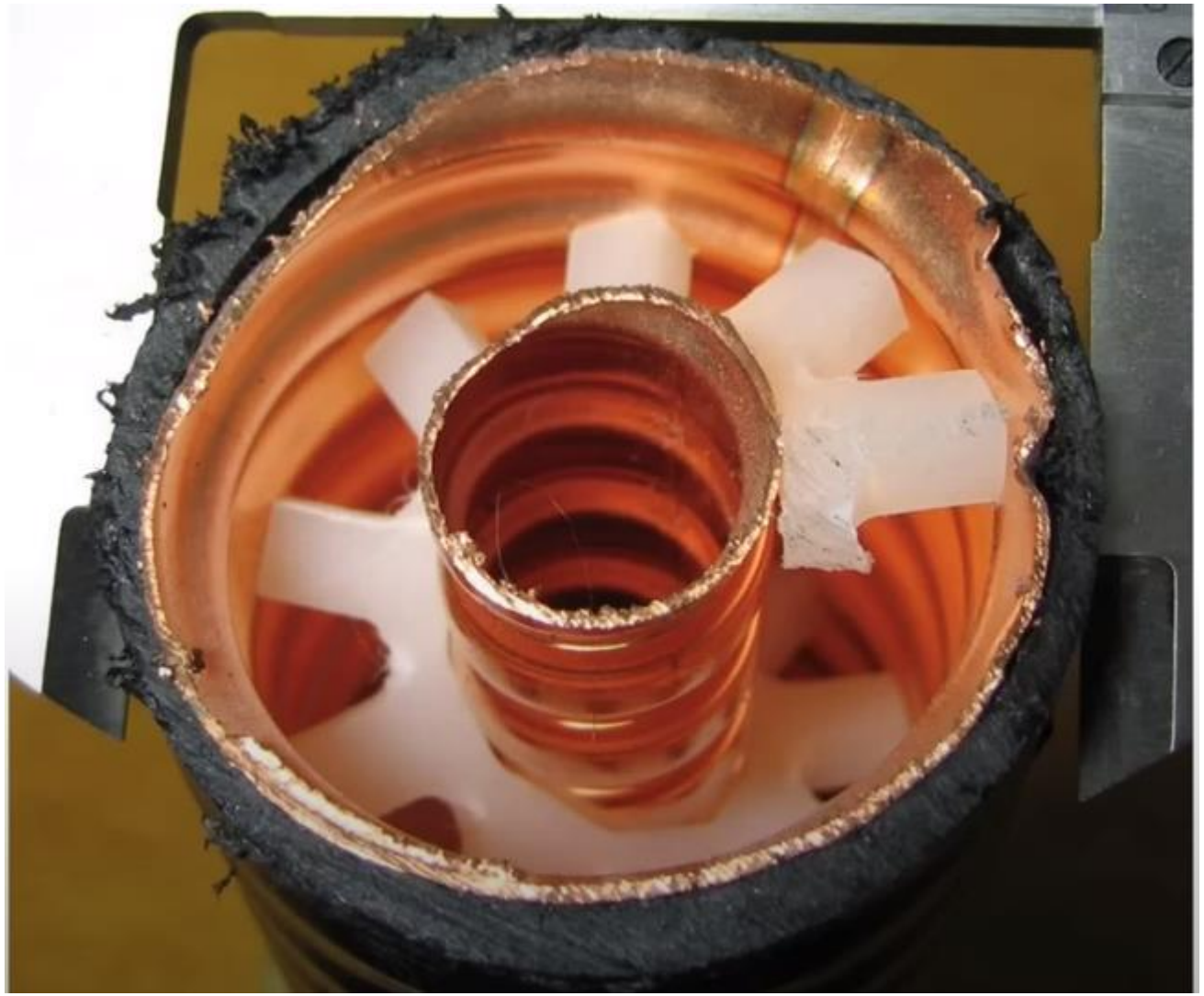
RECOMMENDED USE HELIAX®

High Power/High Frequency Use

Large Heliax (2” pictured)

Center is hollow since all RF is on the outside of the conductor

This reduces weight



ATTENUATION LOSS

Each feedline type has it's own loss characteristics

[Coax Loss Calculator | KV5R.COM]

½ " Heliax 100ft
30 Mhz 0.357db
50 Mhz 0.463 db
150Mhz 0.815 db
450Mhz 1.447 db

Attenuation (dB per 100 feet)

	MHz:	30	50	100	146	150	440	450	1000	2400
#2632	**RG-174**	5.5	6.6	8.8	13.0		25.0		30.0	75.0
#0985	**LMR-100A®**	3.9	5.1		8.8	8.9	15.6	15.8		
#2619	**RG-58A/U**	2.5	4.1	5.3	6.1	6.1	10.4	10.6	24.0	38.9
#3603	**LMR-200®**	1.8	2.3		3.9	4.0	6.9	7.0		16.5
#2910	**RG-59**		2.4	3.5			7.6		12.0	
#2247	**RG-8X**	2.0	2.1	3.0	4.5	4.7	8.1	8.6		21.6
#3604	**LMR-240®**	1.3	1.7		3.0	3.0	5.2	5.3		12.7
#3605	**LMR-240 Ultra®**	1.3	1.7		3.0	3.0	5.2	5.3		12.7
#2248	**RG-8/U FOAM**		1.2	1.8					7.1	
#2929	**RG-213**		1.5	2.1	2.8	2.8	5.1	5.1	8.2	
#0390	**RG-214**	1.2	1.6	1.9	2.8	2.8	5.1	5.1	8.0	13.7
#3606	**LMR-400®**	0.7	0.9		1.5	1.5	2.7	2.7		6.6
#3607	**LMR-400 Ultra®**	0.7	0.9		1.5	1.5	2.7	2.7		6.6
#6512	**DRF-400**	0.7	0.9		1.5			2.7		6.7
#5297	**Bury-FLEX™**		1.1	1.5					4.8	
#0812	**9086**			1.4			2.8	2.8		
#0075	**9913**	0.8			1.5		2.8			7.5

Values indicated are *approximate* and for comparison purposes only.
LMR® is a registered trademark of Times Microwave Systems.

POWER CAPACITY

Each feedline type has it's own power characteristics

[Coax Loss Calculator | KV5R.COM]

½ " Heliax 100ft

30 Mhz 6.51 kw

50 Mhz 5 kw

150Mhz 2.85 kw

450Mhz 1.61 kw

Power Capacity (In watts 104°F, 40°C)									
	MHz:	30	50	150	220	450	900	1500	2000
#0985	LMR-100A®	230	180	100	80	60	40	30	25
#2619	RG-58U	400	300	160		80			
#3603	LMR-200®	1020	790	450	370	260	180	140	120
#2910	RG-59	500	400	250					
#2247	RG-8X	350	280	150		80			
#3604	LMR-240®	1490	1150	660	540	380	260	200	170
#3605	LMR-240 Ultra®	1490	1150	660	540	380	260	200	170
#2929	RG-213	1800	1200	620		300			
#0390	RG-214	1800	1200	620		300			
#3606	LMR-400®	2100	1700	1000	830	550	380	290	250
#3607	LMR-400 Ultra®	2100	1700	1000	830	550	380	290	250
#6512	DRF-400	3300	2570	1470	1200	830	580	440	370
#0075	9913	2200	1700	900		450	280	200	160

Values indicated are *approximate* and for comparison purposes only.
LMR® is a registered trademark of Times Microwave Systems.

SHIELDING

Can help reduce noise.

In general, the more shielding you have, the better the cable will function, particularly over longer distances.

Common Materials:

1. Foil (for High Frequency interference)
2. Braid (For lower frequency interference)
3. Double Braid
4. Copper/Aluminum

RG6 (100/90%) RG58 (100/55%) RG8 (95%) RG214 (95/95%)

FINAL TIPS & TAKEAWAYS

Questions to ask:

1. Permanent, Mobile, Portable
2. Frequency
3. Power

Generally:

Larger coax

1. Lower the loss
2. Handles more power
3. The more it costs!

RECOMMENDED MANUFACTURERS

Best

Times Microwave

Belden

Wireman

DX Engineering

CONNECTORS

PL-259 or “UHF” Connectors

Used mostly on HF radios

N

Used sometimes on VHF, more commonly UHF and up.
Can handle legal limit power

BNC

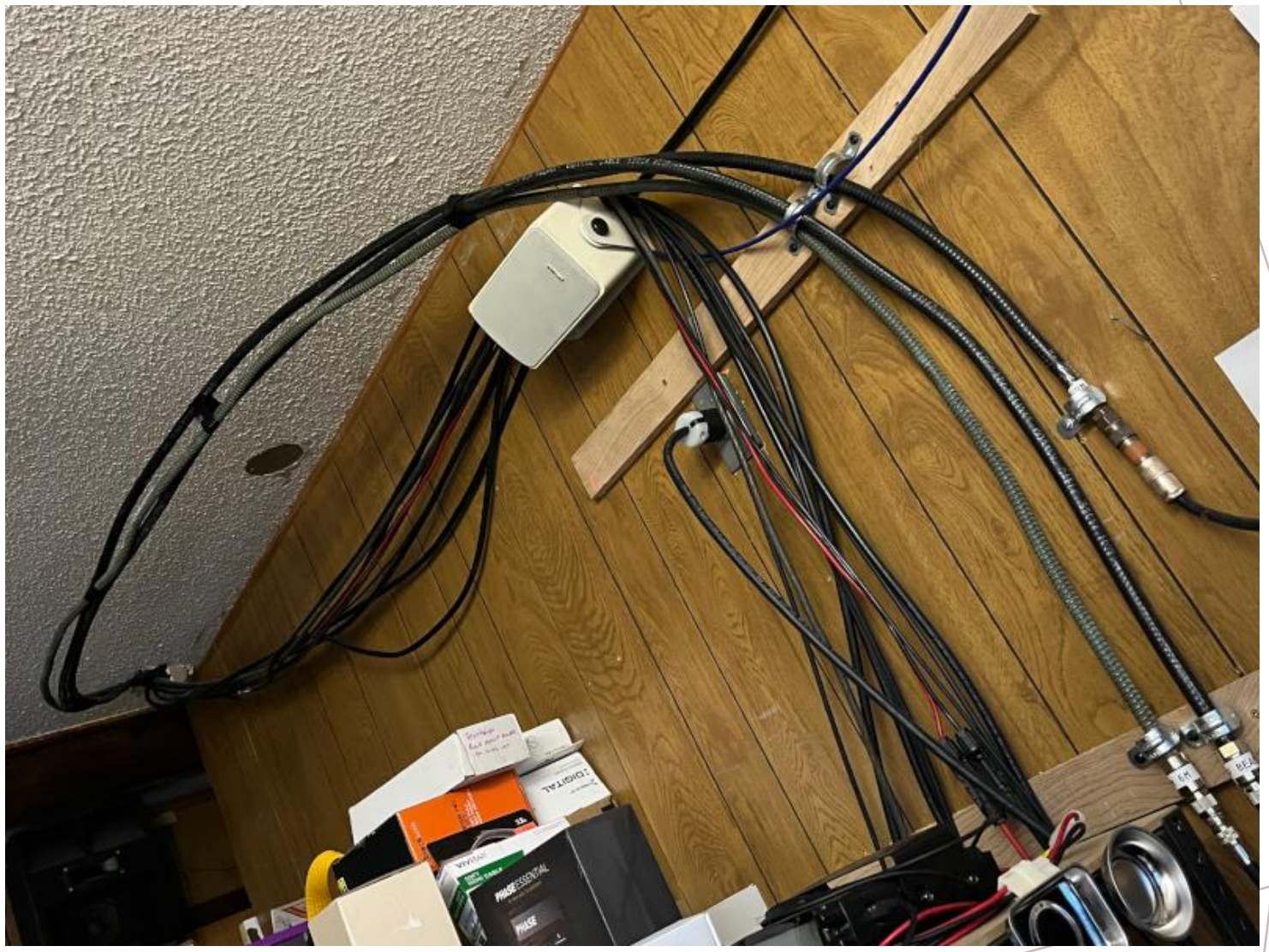
Used on a lot of QRP radios.

Used on smaller coax

A smaller “N” connector, inside is similar.

WHAT AM I USING?

- LM240
- LM400
- ½" Heliax (2m, 6m, Triband yagi)
- RG400, RG8X, RG8 Interconnects



REFERENCES

½" Heliax Specs LDF4-50A (commscope.com)

Coax Loss Calculator https://kv5r.com/ham-radio/coax-loss-calculator/


THANK YOU
Paul Reedy
Ka5pmv