Balcony and Patio Portable HF Antennas

When working with antennas, a person should always think of safety first and consider the hazards and risks involved, even working with small portable antennas. First is overhead hazards such as power lines and other types of cables overhead. Next is trip hazards such as temporarily running coax and power cables across the floor, make sure you route cables in a way to minimize hazards or secure when possible. Next are falling and dropping hazards, even when working from short ladders if needed for your project. If you are working close to the edge of your balcony, find ways to secure tools so they don't accidentally drop and injure someone below. There probably are several other hazards you can think of for your installations, the important thing to is think of them first and take action to prevent an accident before you start working.

You also must consider RF Exposure safety as generally you will be operating near the antenna. Options to minimize your exposure are increased distance, low power and lower frequency. Increasing the distance by a few feet can result in a significant reduction in the RF exposure. For more information go to www.arrl.org/rf-exposure-calculator.

				1.8 MHz		14.2 MHz		28.4 MHz		50.1 MHz	
mode (100W at the dipole)	mode duty cycle	transmit ON/OFF ratio	overall duty cycle	controlled environment	uncontrolled environment	controlled environment	uncontrolled environment	controlled environment	uncontrolled environment	controlled environment	uncontrolled environment
put a brick on the key in CW - WORST CASE	100%	100%	100%	0.54 feet	0.73 feet	2.58 feet	5.76 feet	5.15 feet	11.52 feet	5.44 feet	12.17 feet
FT8/FM/FSK/RTTY	100%	50%	approx 50%	0.42 feet	0.57 feet	2.00 feet	4.46 feet	3.99 feet	8.93 feet	4.22 feet	9.43 feet
conversational CW	40%	50%	20%	0.27 feet	0.36 feet	1.26 feet	2.82 feet	2.52 feet	5.65 feet	2.67 feet	5.96 feet
conversational SSB (no processor)	20%	50%	10%	0.19 feet	0.25 feet	0.89 feet	2.00 feet	1.79 feet	3.99 feet	1.89 feet	4.22 feet

Onto the antennas, for balcony and patios something that is reasonably compact, easy to put up and take down, and needs only one support is preferred. You also need to consider whether grounding or a counterpoise will be needed and how to accomplish it. With these considerations you should consider antennas for 6 – 20 meters. Some antennas will also operate on 40 meters. Generally using a small antenna for lower frequencies (30 – 160 meters) the size severely limits your usable bandwidth even with antenna tuners.

The first antenna to consider is a magnetic loop. Advantage is no ground or counterpoise is required. A loop constructed with coaxial cable tears down compactly for storage. The loops are generally 30" - 40" in diameter. Mounted on a heavy-duty portable tripod, total height will be roughly 6 – 7 ft. When used on a balcony a few stories above the ground, these perform very well with the loop mounted horizontal instead of vertical. You typically are limited to 100 watts or less.

Magnetic Loop

Portable Vertical

Next to consider is one of the many compact and portable vertical antennas available commercially. These all require one or more counterpoises to be used for effective operation. Make sure you have space to extend those. There are some as short as 6 ft with others as long as 16 ft. The shorter ones are available with a short support stand while the longer ones generally require support driven into the ground. Some HF mobile antennas will work as a portable vertical with a counterpoise and stand. Some mobile antennas can be assembled as a dipole which eliminates the need for a counterpoise (see picture).

Mobile antenna dipole (2 Hamsticks)