



PACIFIC CREST

ADL Vantage Pro and Battery Life





5 factors affecting battery life

- 1. Battery size and type**
- 2. Battery age**
- 3. Ambient temperature**
- 4. Radio output power**
- 5. Radio duty cycle**
 - Packet size (# SVs)
 - Data format (degree of data compression)
 - Link rate
 - Channel bandwidth
 - Data protocol



Factor #1: Battery size and type

- **The ADL Vantage Pro battery holds 35 Amp-hours of charge**
- **You can purchase larger batteries holding more charge but they cost more and are heavier**
- **Use only a battery designed for deep cycle operation: wheelchair or golf cart batteries**
- **Car batteries are not suitable and can easily be damaged**



Factor #2: Battery age

- **The older a battery is, the longer it takes to fully recharge it and the shorter it takes to discharge it**
- **Batteries typically tolerate 100-300 charge cycles; the higher the output power, the fewer charges the battery will tolerate**
- **Replace batteries older than 3 years or 300 recharge cycles**



Factor #3: Ambient Temp

- **All batteries are optimized for operation at 23°C (75°F)**
- **When temperatures are below freezing, put the radio on the battery or put the battery inside a vehicle or shelter**
- **When the air is very hot, put the radio and battery in the shade and off the ground**



Factor #4: Output Power

- **Lowering power proportionally increases battery life**
- **Using a 5 dB antenna greatly increases the Effective Radiated Power (ERP)**
 - 15W through a 5 dB antenna goes as far as 35W through a unity gain antenna
- **Raise the antenna as high as possible**
 - 15W through an antenna at 10 feet goes as far as 35W through an antenna at 6 feet

Range as a Function of Output Power, Antenna Gain and Antenna Height

TX Power (Watts)	Ant Gain (dB)		Ant Elev (ft)		ERP (W)	Range**	Battery Life**
	Base	Rover	Base	Rover			
35	0	0	6	6	25.2	100%	100%
35	5	0	6	6	79.7*	133%	100%
35	5	5	6	6	79.7*	178%	100%
35	0	0	10	6	23.6	127%	100%
35	5	0	10	6	74.8*	169%	100%
35	5	5	10	6	74.8*	226%	100%
15	0	0	6	6	10.8	81%	233%
15	5	0	6	6	34.2	108%	233%
15	5	5	6	6	34.2	144%	233%
15	0	0	10	6	10.1	103%	233%
15	5	0	10	6	32.0	137%	233%
15	5	5	10	6	32.0	183%	233%
* Requires a 75 or 80 W license							
** Normalized to 35W, 0 dB antennas at 6 feet							



Factor #5: Duty Cycle

- The lower the duty cycle, the longer the battery life
- Duty cycle is determined by
 - Packet size (# SVs)
 - Data format (degree of data compression)
 - Link rate (Channel bandwidth and data protocol)
- Switching to CMRx format is ***strongly recommended***: packet size (hence duty cycle) is reduced 60%



Link Rate: Channel Bandwidth

- If you operate in a 12.5 kHz channel, you should use a data protocol that can handle higher radio link rates:
 - Transparent FST @ 9600 bps
 - TRIMMARK 3 @ 9600 bps
 - TRIMTALK 450S @ 8000 bps



ADL Vantage Pro Do's and Don'ts

- **Recharge all batteries before use**
- **Replace batteries after 300 charges or 3 years**
- **Use a 5 dB gain antenna elevated to 10 feet**
- **Set TX power to 15W; increase only if needed**
- **Use CMRx data**
- **Use Trans FST, TM3 or TT450S protocol @ 9600 bps (12.5 kHz)**



ADL Vantage Pro Do's and Don'ts

- **When it's very hot:**
 - Don't set up the radio and battery in direct sun
 - Don't leave the radio/battery on the ground where temperatures are highest and air circulation is lowest
- **When it's below freezing:**
 - Put the radio on the battery
 - Put the radio and the battery out of the wind