

ADL Vantage Pro and Heat

- Vantage Pro's power amplifier selected for high reliability and long life
- The downside: it makes more heat than the HPB's power amp
- The HPB's housing stayed cooler because it was poorly coupled to the power amp
- The downside: HPB's internal heat wasn't dissipated as well leading to lower reliability

ADL Vantage Pro and Heat

- ADL Vantage Pro's housing is well coupled to the power amp. This prevents overheating and will extend product life
- The downside: the housing gets hotter than the HPB's housing
- It never gets too hot to hurt the radio but it can get too hot to hold without the handle

The 5 Heat Factors

1. Ambient temperature
2. Ventilation
3. Solar radiation
4. Output power
5. Duty cycle
 - Packet size (# SVs)
 - Data format (degree of data compression)
 - Link rate
 - Channel bandwidth
 - Data protocol

Heat Factor #1: Ambient Temp

- Under normal operating parameters, ADL Vantage Pro will continue operating at 35W as long as the air temp remains below 37°C (99°F)
- Hotter than this and the Automatic Power Management kicks in, reducing power by 30%
- To keep the radio at 35W, you must change one or more of the other 5 factors

Heat Factor #2: Ventilation

- Tests show that even on still days, there is enough air moving over the Pro's heat sink to keep it automatically reducing power - as long as the radio is on a tripod and not on the ground
- No ADL Vantage Pro has ever reduced its power when attached to its fan mounts:
 - Tripod mount: P/N 82218-15; \$295
 - Wall mount: P/N 82218-16; \$375

Heat Factor #3: Solar Radiation

- Set up the ADL Vantage Pro in the shade, hang it on the side of the tripod away from the sun, or use a shade whenever possible
- However, do not put anything over the radio in such a way that it restricts the free movement of air over the heat dissipation fins
- The movement of air over the fins dissipates far more heat than is generated by solar radiation

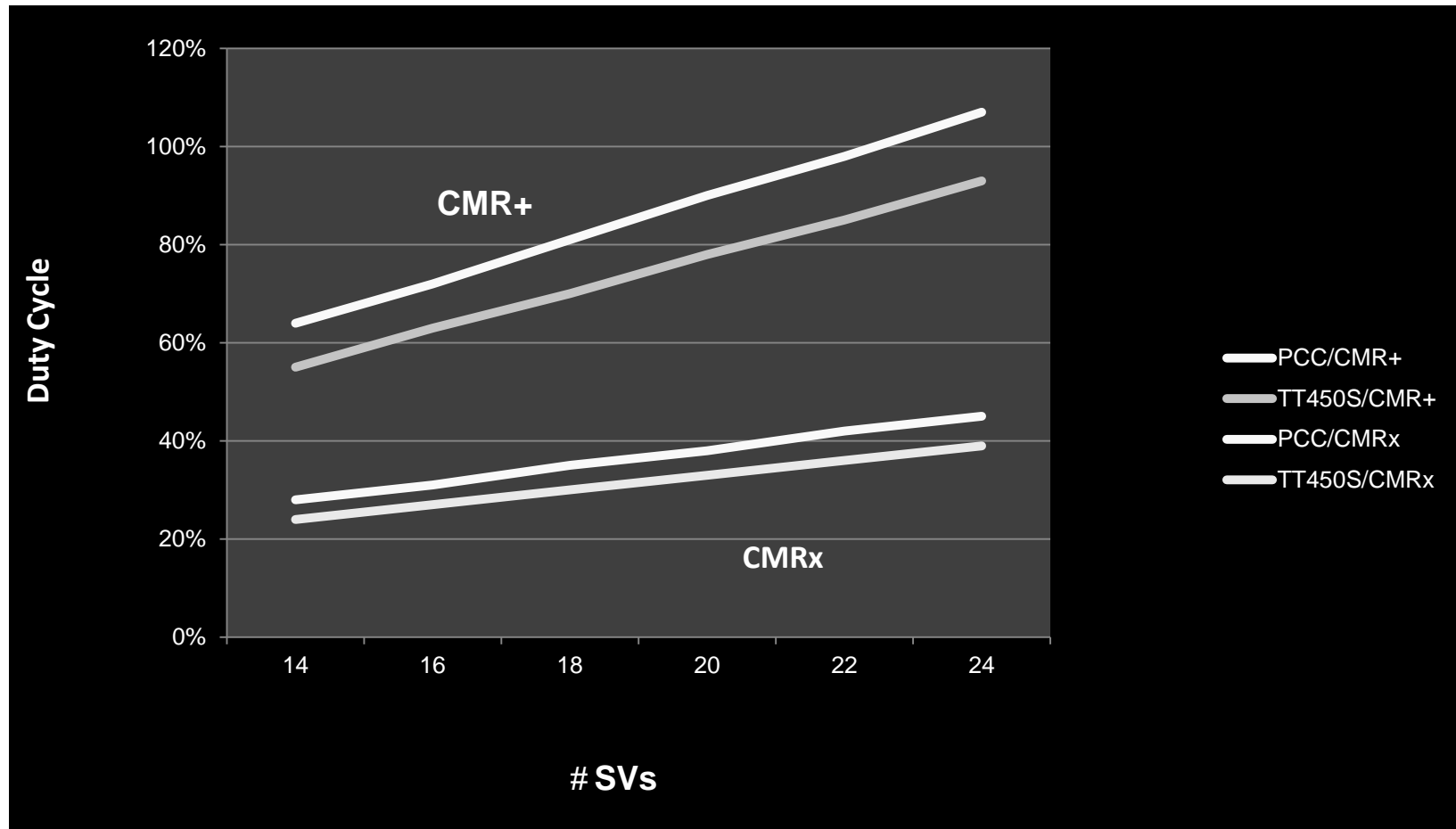
Heat Factor #4: Output Power

- Output only as much power as you need. ADL Vantage Pro range @25W \approx HPB range at @35W
- When set to a lower power, if Automatic Power Management comes on it will reduce power by 30% of a smaller number and the radio will return to full power faster
- Lowering power proportionally increases battery life
- ADL Vantage Pro's Range Stable feature means it will output the set power as the battery drains

Heat Factor #5: Duty Cycle

- Duty cycle is determined by
 - Packet size (# SVs)
 - Data format (degree of data compression)
 - Link rate (Channel bandwidth and data protocol)
- Raising the elev mask reduces the # SVs, but also reduces accuracy – so it's not recommended
- Switching to CMRx or ATOM format is *strongly recommended*: packet size (hence duty cycle) is reduced 60%

Packet Size and CMRx



- When operating in 12.5 kHz channels, use CMRx corrections
- At present, only Trimble receivers support CMRx

Link Rate: Channel Bandwidth

- Narrowing from 25 to 12.5 kHz halves the link rate – typically from 9600 to 4800 bps
- Halving the link rate doubles the duty cycle
- Doubling the duty cycle doubles the heat and halves battery life
- So...

Link Rate: Channel Bandwidth

- If you operate in a 12.5 kHz channel, you should use a data protocol that can handle higher speeds:
 - Transparent FST @ 9600 bps link rate
 - TRIMMARK 3 @ 9600 bps link rate

Transparent FST Protocol

- Twice the throughput with no reduction in range
- Transmitter is on half the time so it consumes half the power and generates half the heat
- No ADL Vantage Pro has ever reduced power when set to Transparent FST
- Battery charge lasts twice as long

ADL Vantage Pro Do's and Don'ts



- Use the handle!
- Set the power to the minimum required for the job
- Don't set up the radio in direct sun
- Don't leave the radio on the ground where temperatures are highest and air circulation is lowest

ADL Vantage Pro Do's and Don'ts

- Consider gained antenna(s)
 - Unity gain @ 35W: EIRP* = 26W, range = 5.3 mi
 - 5 dB gain @ 15W: EIRP* = 35W, range = 5.7 mi
- A battery will last > 2 X longer @ 15W than it will @ 35W
- The radio will generate < 1/2 the heat @ 15W than it will @ 35W

*EIRP = Effective Isotropic Radiated Power, the power leaving the antenna, as opposed to the power leaving the radio

ADL Vantage Pro Do's and Don'ts

- When setting up indoors, use the wall mount/fan accessory (P/N 82218-16)
- Reduce the radio's duty cycle (length of time that it is transmitting):
 - Use CMRx formatted corrections
 - Use a high efficiency protocol like Transparent FST or TRIMMARK 3 that allows you to double the radio link rate
 - Transmit corrections every other second