Recharge and Refill Cycles Guide - Atmospheric Filtration Drone Swarm

This document outlines standardized cycles for battery recharge, filter replacement, and field readiness. It is used to maximize uptime, ensure consistent air purification efficiency, and minimize downtime in any operational theater.

Battery Recharge Cycles

Drone Model	Battery Life (hrs)	Max Flight Time (hrs)	Recharge Interval	Solar Boos
AFDS-Alpha	10	8.5	Every 2 missions (<16h)	Optional (3
AFDS-Beta	14	12	Every mission (12-14h)	Yes
AFDS-Micro	6	5	Every mission	No

- RTB triggered at <15% battery
- Solar-equipped units trickle-charge when idle mid-day
- Battery swap under 2 minutes
- Smart queue logic at 12-24 port hubs

Filter Refill Cycles

Filter Type	500000	Swap Threshold (%)	Interval	Notes
Mycelium	850000	85%	Every 2-3 missions	Avoid wet zones post-deploy
Carbon	1100000	90%	Every 3-4 missions	Urban/industrial optimized
Hybrid	1,100,000	80%	Every 1-2 missions	DAO auto-flag enabled

- Filter load checked every 15 min onboard
- DAO log auto-updates filter status
- Swap occurs when load > threshold
- Must log filter serial at refill station

Field Refill Station Overview

- Recharge racks: 24 drones per node
- Filter types stocked: Mycelium, Carbon, Hybrid
- Passive cooling & sealant barriers for station
- Mobile variant fits standard truck bed
- Optional 750W solar module

Example Mission Cycle

06:00 -> Drone launch

08:00 -> First telemetry batch

10:30 -> Filter hits 82% (warning)

12:00 -> Battery <20%, drone returns

12:10 -> Recharge + filter swap

13:30 -> Relaunch

18:00 -> Final return + diagnostics