

Sequential Transfer Learning Across UAV Platforms

PHASE 1: Base Training

Crazyflie 2.X

0.027 kg (Baseline)

Train from scratch

Steps: 20,000

Time: 200 min

RMSE: 1.34 m

Transfer 01
(75% step reduction)

Racing Drone

0.800 kg (29.6× heavier)

Load 0 → Fine-tune

Steps: 5,000 (75% ↓)

Time: 52 min

RMSE: 1.33 m

Transfer 02
(75% step reduction)

Generic Quadrotor

2.500 kg (92.6× heavier)

Load 0 → Fine-tune

Steps: 5,000 (75% ↓)

Time: 52 min

RMSE: 1.34 m

Transfer 03
(75% step reduction)

Heavy-Lift Hexacopter

5.500 kg (203.7× heavier)

Load 0 → Fine-tune

Steps: 5,000 (75% ↓)

Time: 59 min

RMSE: 1.34 m

Total Training Summary

35,000 steps, 363 min (6.1 hrs) with transfer
vs 80,000 steps, 801 min (13.4 hrs) without transfer

Savings: 56.2% time, 75% steps per platform