

## Overview

RotorLib CGF is C++ library designed for simulation developers who want to add helicopter CGF entities to their simulations. RotorLib CGF allows developers to

- task friendly or opponent helicopter entities to perform high level maneuvers like route following, attack, takeoff and landing
- provide instructors to take control of a CGF helicopter and fly around with a gamepad or joystick
- utilize a number of low levels tasks such velocity hold to create new maneuvers such as bob-up
- create complex mission rules for helicopters

## Customer Applications

### Computer Generated Forces Applications

- Battlefield and Urban helicopter operations
- Autonomous wingman
- Autonomous targets
- Simulation of autonomous UAV entities
- Air traffic control simulations

### Helicopter and ground crew training

- Marshaling simulator
- Door gunner training
- UAV operator training
- Winch operator training

## Features

### Supported helicopter configurations

- Attack
- Utility
- Cargo
- Quadcopter
- Single main/tail rotor UAV
- Co-axial and tandem

### High level tasks

- flying to point (with coordinated turns or user provided heading)
- following a route (with or without terrain following)
- landing to a user defined point
- landing to ship deck
- joystick flight
- reaching and holding a user provided velocity vector
- holding a user defined attitude
- coming to a hover (from any initial state)
- slung load flying (add-on)
- ship deck landing and takeoff (add-on)
- formation flight (add-on)
- terrain following flight



## RotorLib CGF for C++

### Low level tasks (combine to create new high level tasks):

- Fly with given velocity vector
- Fly with given heading and attitude

### Realistic manual flight modes

- Game mode (very easy manual flight)
- Attitude and heading hold (helicopter with advanced SAS)
- Direct mode (helicopter with rudimentary SAS)

### Physics

- 6DOF physics model
- Ground interaction
  - steering
  - rolling
  - braking
  - landing gear suspension
- Slung loads (add-on)
- Inclined surface landing
- Ship deck landing (add on)

### Electronic Warfare and Weapon Support

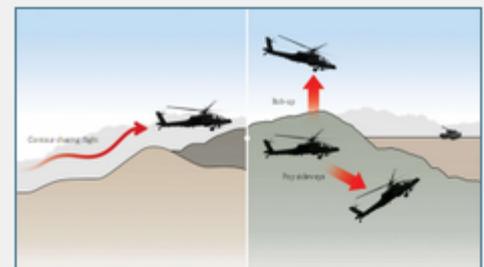
- EWAWS weapon and missile loads
- EWAWS onboard RADAR
- EWAWS countermeasures including flares, chaffs, jammers and towed decoys

### SDK Simulation Features

All RTDynamics models are part of a single C++ library, this allows developers to use the same SDK to integrate the products into their simulations. Models can also run in the same simulation world, for example all helicopter and aircraft models can carry EWAWS radar models, or can be targets of a EWAWS missiles.

### API

- C++ API
- XML Configuration File Format
- Multi-Platform: 32/64 Bit Windows and Linux.
- Binaries available for all common Visual Studio version and Linux distros.



Terrain Following and Bob sideways



RotorLib CGF Shipdeck Landing



Realistic Manual Flight Modes



## RotorLib CGF for C++

### Simulation Execution and Fidelity

- Real-time, faster than real-time (batch mode) and slower than real-time simulation
- Unlimited number of entities can be simulated with a single license
- Deterministic simulation
- State save and load (a.k.a. state snapshot/restore)
- Real-time simulation data recording

### Integration & Visualization

- Easy Integration with
  - Image Generators and 3d Visualization Tools
  - Control Loading Systems
  - Virtual and real cockpit instruments
- 3D Visualization
- Headache-free licensing

### Formation

The follow entity controller of RotorLib CGF can simulate formation flying including joining formation, holding position in formation and leaving formation.

