C++ Programming Challenge

Instructions

- Please assume that:
  - All messages are sent and received as a stream of binary data, with each byte containing 8 bits of message content. Bits are sent/received from MSB to LSB.
  - All message fields are in Network Byte Order. The code should be agnostic to endianness.
- Please submit your header and source files only, plus the execution result print-out. Please do not submit your executable, project files, etc.

1. A hypothetical protocol used to communicate with UAVs has the following common fields:

Bits	Field
16	Message ID
8	Sender ID
8	Receiver ID
32	Payload Length
Variable	Payload

Implement a C++ class that can be used as the base class to develop specific messages later. This class should have the following features:

- Initialization of common fields.
- Access method for each and every common field.
- A virtual Send function that returns a string containing the message to be sent.
- A virtual Receive function that accepts a string containing the message received, and populates the values of the common fields.

2. Implement a C++ class using the base class above to process a message with the following payload:

Bits	Field
1	Lights
1	Camera
6	Action
64	Name

This class should have the following features:

- Inherits the base class in Problem #1.
- Initialization of all payload fields.
- Access method for each and every payload field.
- A Send function that returns a string containing the message to be sent.
- A Receive function that accepts a string containing the message received, and populate the values of the payload fields.

3. Write a unit test framework to verify your implementation above. Use your engineering judgment on the scope of your test cases. A text print-out should be produced for the result of each test case.