

Bob 2 (Eve)

Mission 2 : Eavesdropping Quantum Keys

90 minutes of gameplay [60/200 points]

Your evil mastermind seems to work out. Thanks to your professional team mate, you now have a direct connection (splitted) from Alice's photons. You can look at her polarisation choices. At the same time, you have made some deal with Charlie. Things are just going to get better **The aim of this mission is to perform a photon number splitting attack, analyse your measurement results, and determine the secure key.**

This mission is divided into smaller tasks, which consists of compulsory and optional tasks. The compulsory tasks are marked with either [Checkpoint], [Final Task], or [Secret Task] flags, while the unmarked tasks are sort of optional. It is thus a priority to complete all the flagged tasks before the optional tasks, as one will not be able to revisit these tasks after the deadline. The compulsory tasks are very important for the upcoming missions. It is also highly advisable to split the tasks among your teammates.

[20 points] [Checkpoint] Distinguish Alice's polarisation states

We live in a very insecure world with a very insecure communications platform.

- John McAfee

Objectives:

1. Successfully detect Alice's photons,
2. Modify the angle of the receiver polariser to be able to distinguish the 4 polarisation states sent by Alice, and
3. Predict the values of the polarisation value bits and basis bits sent by Alice

Point allocation scheme:

- [Full] points after completion of the mission

Step by step walkthrough:

1. Jianwei's command

[10 points] Jian Wei's handout

Blah blah bluh.

- Jian Wei

Objective: Complete the Jian Wei's handout. No cheating or copying with Charlie allowed [insert stern warning].

Point allocation scheme:

- Based on the number of correct responses in the handout.

[10 points] Randomness handout

Creativity is the ability to introduce order into the randomness of nature.

- Charles Bennett and Gilles Brassard

Objective: Complete the Randomness handout. No cheating or copying with Bob allowed [insert stern warning].

Point allocation scheme:

- Based on the number of correct responses in the handout.

[20 points] [Final Task] Eavesdrop the secret key

No one, including me, can totally rule out data surveillance. That's why I write my text messages and emails so that they stand up to being read.

- Frank-Walter Steinmeier

Objective: By using the spying tools developed in the checkpoint task, eavesdrop the secret key sent by Alice to Bob (there will be a total of 4 keys). The GameMaster will guide Alice and Bob in the process of sending key, so listen to the GameMaster on when to listen. For each attempt, you need to write down your predictions (max 6 predictions) in a piece of paper, before the GameMaster announces it. Your facilitator will help you in validating the keys.

Point allocation scheme:

- [Full] points by successfully and correctly eavesdropping all the secret keys, or
- Maximum of [100%] of total points, proportional to the number of correctly eavesdropped keys.