Problem Chosen	2021	Team Control Number
B	**MCM/ICM** **Summary Sheet**	2100079

Our Thesis for 2021 MCM Problem B

Summary

Keywords: keyword1; keyword2

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Contents

1 Overview

1.1 Background

The wildfires in Australia recently has drawn great focus. Frequent wildfires bring fire extinguishing system great pressure, thus the assistance of automatic devices, like Unmanned Aerial Vehicle(UAV), radio and unmanned reconnaissance, should be taken into considerition.

1.2 Restatement of the Problem

The unmanned devices to respond to the bushfires can be divided to two kinds, the SSA Thermal Imaging system and the Radio Repaeters, with each UAV carrying one of them. To gurantee that the Safty Cofficient meets the satandard, we should balance the number of SSA and RR carried by UAVs, in order to acquire best economic benifits.

Moreover, the prediction of the bushfires in the next decade in East Victotia is required we will explain how to apply our model to respond to the bushfires.We are also required to point out where the UAVs with Radio Repaeters should be.

2 Notations

- **Unmanned Aerial Vehicle** $\rightarrow$ UAV

- **Radio Repaeter** $\rightarrow$ RR

- **Rapid Bushfire Response** $\rightarrow$ RBR

3 Hypothesis and Justifications

1. **The EOC will be set near the fire and will not move**

2. **The Radio Repaeters'(RR) flights are always at their highest speed and will keep their location at the fires**

3. **The wildfires are considered as discrete dots(Firepoints)**

4. **The UAV with SSA system must work within 5Km from the firepoint**

5. **Ignore the side effects like Doppler Effecet and the influence of the winds**

4   Model Overview

5   Model Theory

6   Model Implementation and Results

7   Sensitivity Analysis

8   Disscussion

9   Conclusion