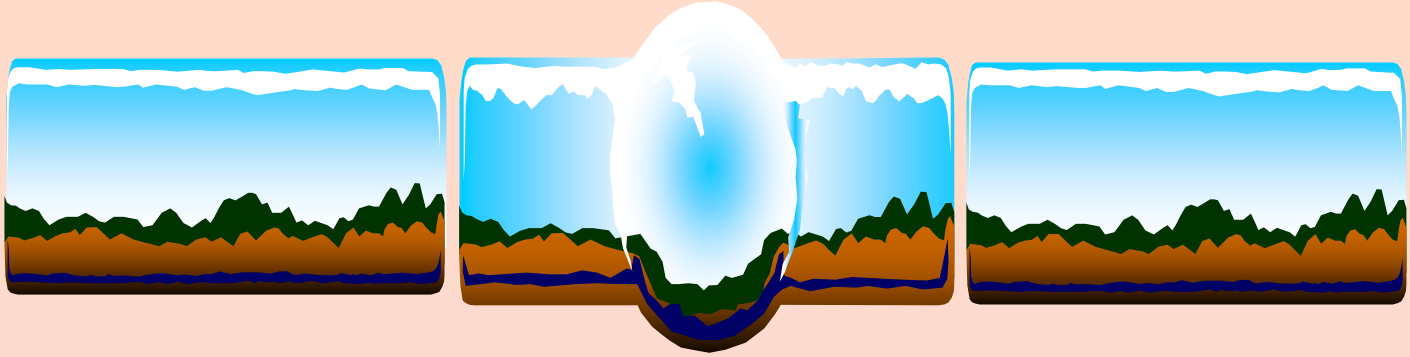
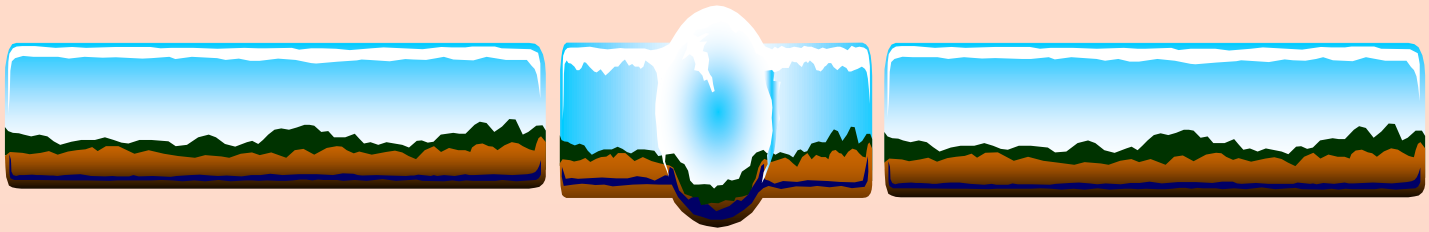


Survivor-
The Australian Outback

Sean Brown

Sarah Maura

Jonathan Sower



The Problem

During our rigorous adventure on the hit network show Survivor it became necessary to guide a supply helicopter to a designated drop zone to re-supply our tribe. The tribe to get the supplies closest to the drop zone and closest to 12 PM will take all the goodies and move forward. In order to get the supply chopper to the drop zone we first needed a map and lay out of the terrain. Upon receiving a copy of a not so detailed map of the land it became necessary to find the best possible route for the helicopter to follow.

How we Solved it

We felt a straight line is always the best way to fly but it then became necessary to figure out how to get the helicopter to the designated drop zone. We were able to do this by drawing a right triangle on our map see fig 1.1 and then calculated the angles at each corner.

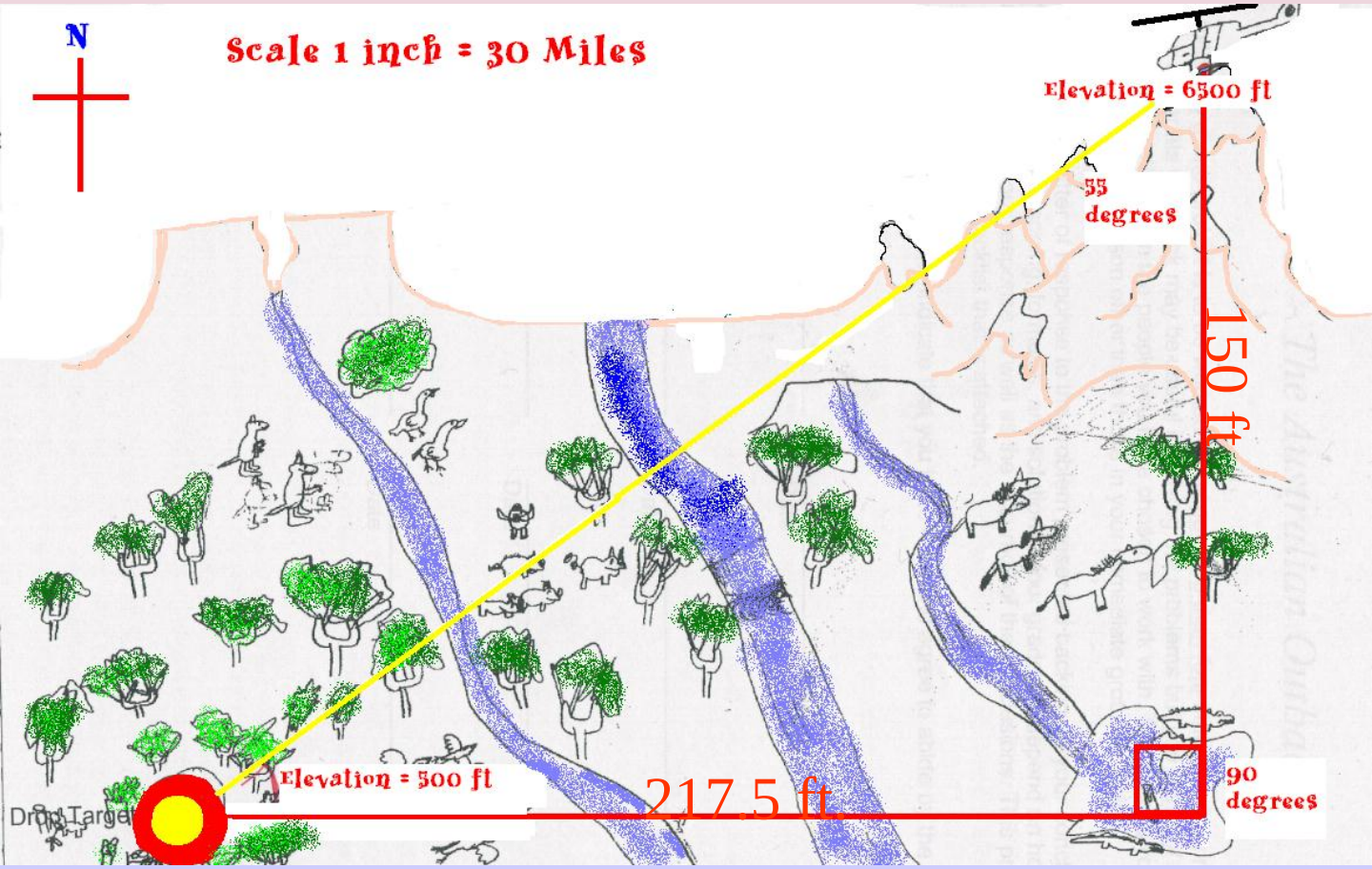
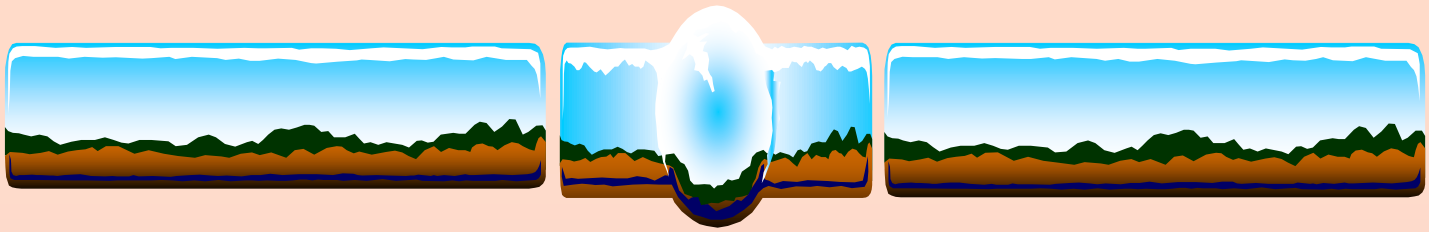


Figure 1.1



The angles then gave us the degree in which the helicopter must rotate from a position of facing due north. The helicopters initial height would be 6500 ft in elevation and would have to gradually drop to an elevation of 1000 ft or 500 ft above the ground at the drop zone. Now you may wonder why in the world we would want to drop all of our valuable supplies from 500 ft above the ground well it turns out that we are camped out in a thick forest and we figured out that the tallest tree is about 480 ft tall so to keep the helicopter, the pilot, and the valuable cargo safe it is necessary to stay at 500 ft above the ground. But now we are faced with another dilemma. If the helicopter should actually arrive on time and actually find its way to the correct drop zone will the supplies actually survive the fall from the chopper to the ground. We have constructed a make shift landing pad for the crate and we have figured that as long as the invaluable package doesn't exceed a fall of 300 ft per sec than all the contents should arrive in good order. We were able to calculate the rate of decent of the package and it was

falling at about 178.66 ft per sec see fig 1.2.

The Drop Speed Equation:

The y-axis on this chart shows, feet and time (seconds) as the x-axis.. The line starts at (0,500), and end at (5.59,0). The equation will for this line is $-16t^2 + 500$. The math to figure out the maximum speed of the drop is (.0304-1.817)/(.59-.58) = -178.66

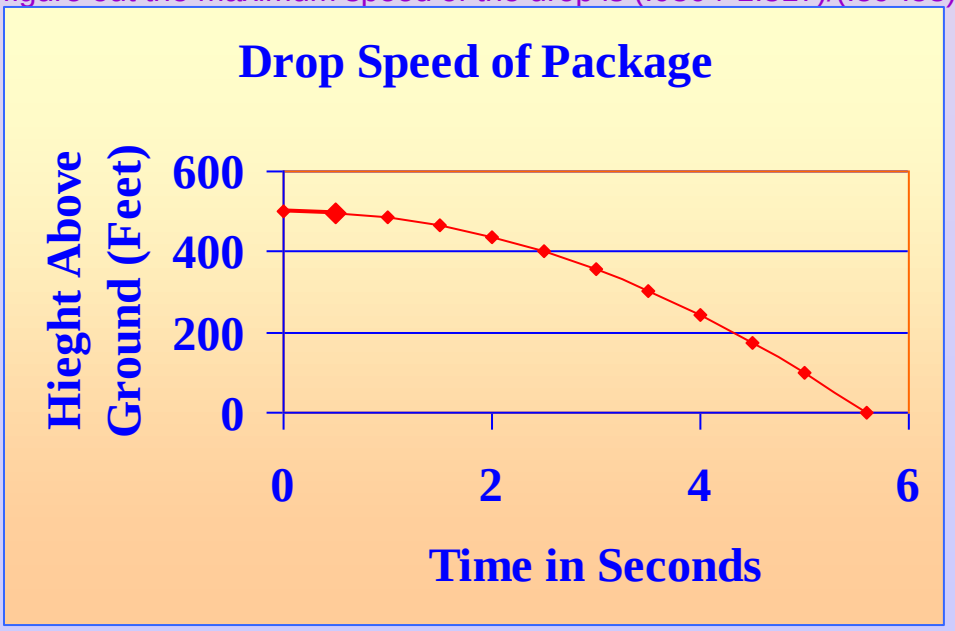
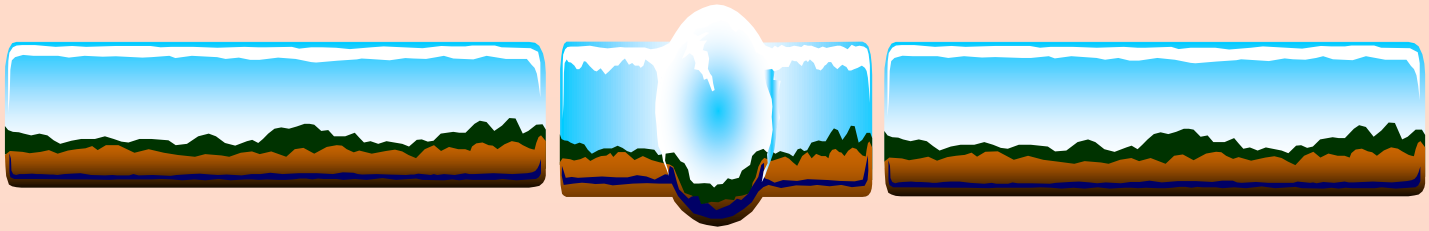


Figure 1.2



The Flight Plan

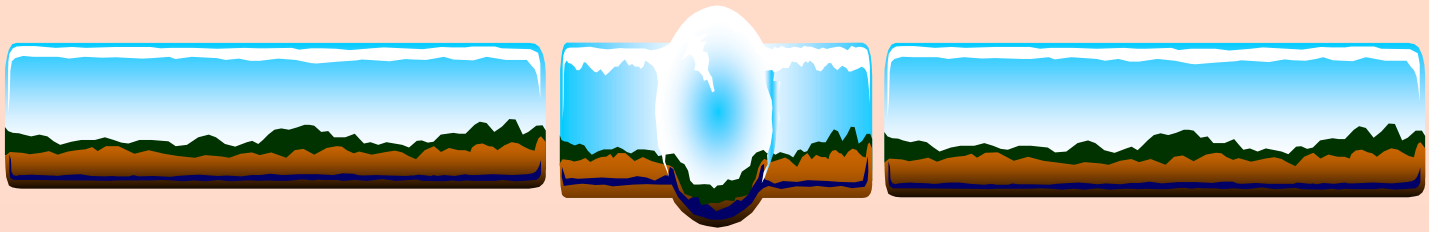
Now that we have calculated all the necessary information we will now send the information and specific instructions to the pilot by way of the Aborigines and as long as the messenger doesn't get eaten by a crocodile or beaten senseless by a kangaroo we should see our supplies in a couple of days.

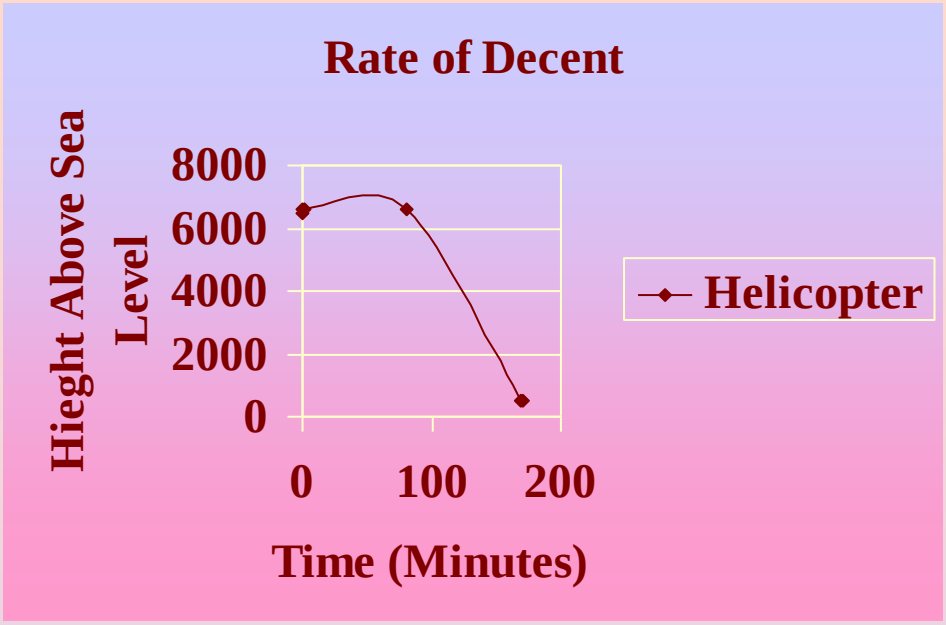
Dear Survivor Pilot,
Here are the instructions you will need to make the drop. Please follow them exactly in order for us to receive our needed supplies.
1. We need you to lift off at 9:19 am, facing due north, rising 100ft.
2. Make a counterclockwise rotation of 125 degrees
3. Accelerate to 100 miles per hour, these first three steps will take less than 30 seconds.
4. Fly in a straight line for 81 minutes.
5. At this time you are flying over the river at an altitude of 6600 feet, continue at a speed of 100 miles per hour, while descending at a rate of 70.9 feet per minute for 78 minutes 30 seconds.
6. Slow to a stop which will take you less than 30 seconds you are now 500 ft. above the target
7. Drop supplies.
I hope you have the auxiliary fuel, if not you will not make it back.

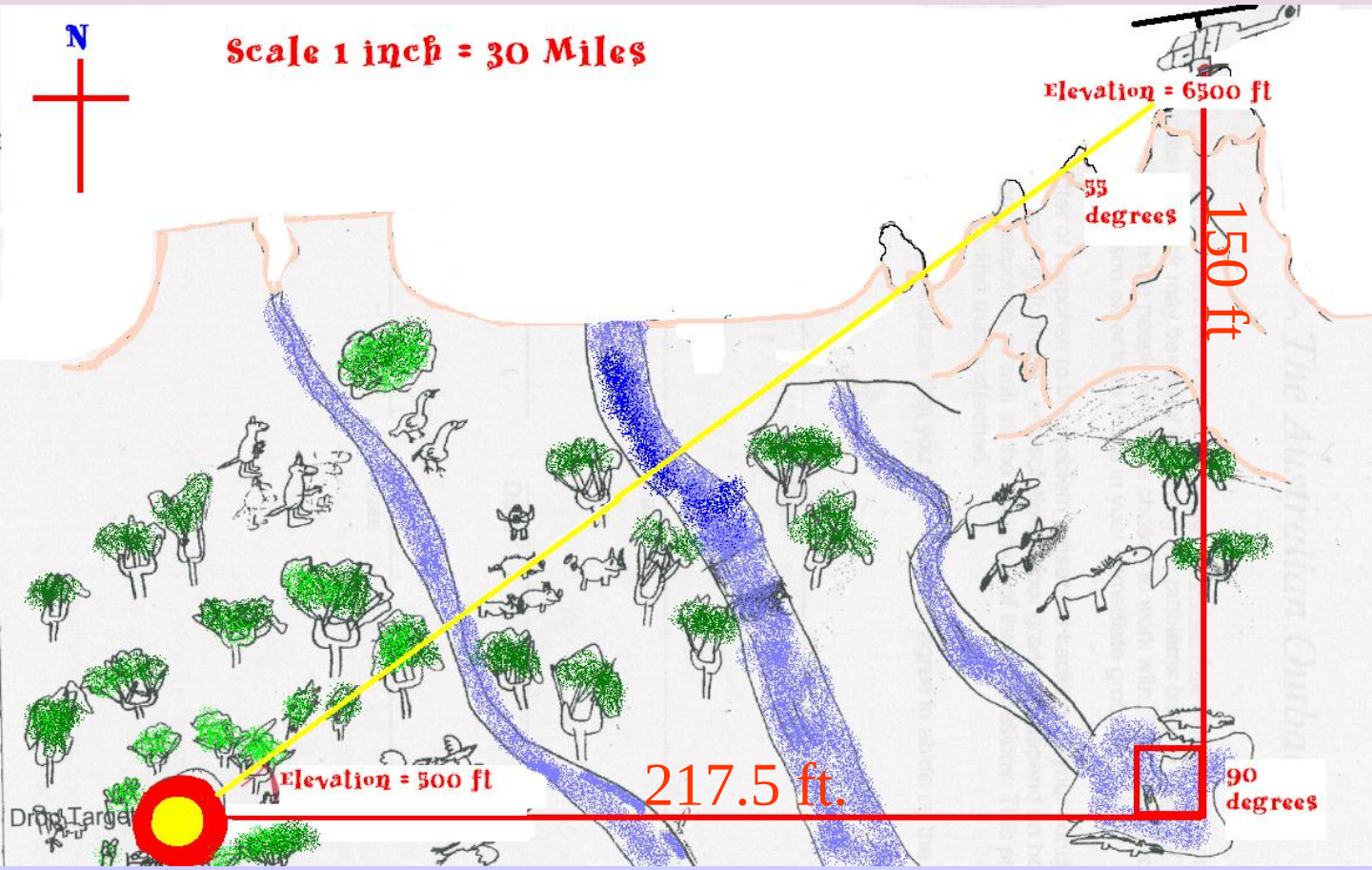
Thank you,

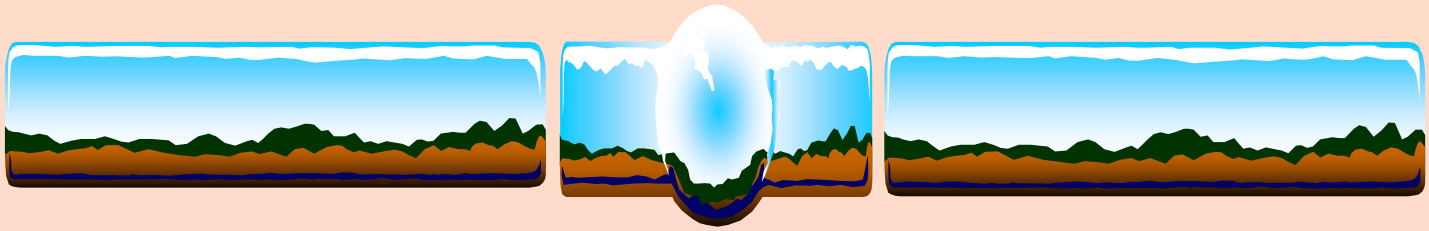
The Tribe

Figure 1.3




Rate of Decent
Hieght Above Sea Level
8000
6000
4000
2000
0
0
100
200
Time (Minutes)
Helicopter


N
Scale 1 inch = 30 Miles
Elevation = 6500 ft
55 degrees
150 ft
Elevation = 500 ft
217.5 ft.
90 degrees
Drop Target



Bibliography

Richard H. Waring, "Tree," *World Book Online Americas Edition*, http://www.aolsvc.worldbook.aol.com/wbol/wbPage/na/ar/co/565

60, March 20, 2002.