

# Mountain Rescue

On a Tuesday evening in June, a small, two-engine plane crashed in central Utah. The pilot, Jimbo Hoskins, had parachuted out of harm's way moments before the plane had hit the ground. Although he had survived the crash, his ankle had broken upon impact. His survival gear included water, a 357 Magnum, and a signaling device with a range of up to 15 miles.

Jimbo clutched the small compartment in his flight gear to assure himself that the small packet containing a priceless microchip was still in his possession. This microchip contained the highly classified locations of a foreign power's chemical weapons depots. For a moment he thought of the serious consequences were this chip to fall into the wrong hands.

Air traffic control in Provo had been alerted to the highly sensitive nature of this flight. They had kept a watchful eye on the little blip tracking the plane from the moment it first appeared on their radar screen. When the blip mysteriously disappeared, the controllers immediately contacted the CIA in Langley, Virginia. They were able to identify the point of disappearance within a ten-mile radius.

At 3:45 a.m., Wednesday, a government jet landed at the Salt Lake City International Airport. Four CIA agents disembarked and were met by Baxter Dudley, field supervisor for the State of Utah. These highly qualified agents, Skip, Biff, Muffy, and Bunny, had been selected for this mission due to their uncanny intelligence and resourcefulness.

Baxter had spent much of the night hurriedly gathering everything the agents might require to complete this crucial mission, including a fully equipped Lincoln Navigator, highway maps, and detailed USGS topographic maps. After instructing the team on how he could be contacted should the need arise, he bade them farewell and good luck.

As Baxter turned to leave, Muffy asked, "Why are we driving? A helicopter would be much quicker."

"Two reasons," the supervisor replied. "First, there are subversives who are aware that the plane went down. It would be very easy for them to track any aircraft flying toward or within the vicinity of the crash. Second, the plane may have crashed in a remote area where landing a helicopter may be impossible"

Skip volunteered to drive, Muffy climbed into the front passenger side, and Biff and Bunny slid into the rear. "Biff, grab the Salt Lake City North Quad," ordered Muffy as Skip slipped the Navigator into drive and headed away from the airport. "Let's review our skills at reading topographic maps while we have time."

"Alright," responded Biff, "What is the scale of the Salt Lake City North quad?"

“That’s an easy one. The scale is 1 SLCN,” answered Muffy.

“Which quad is to the North of the Salt Lake City North Quad?”

“2 SLCN. Ask something a bit tougher. Would you, please?”

“What are the coordinates at the corner of the quad where the South and West neat lines meet? Don’t forget to state latitude before longitude.”

“Let’s see,” sighed Muffy. “The coordinates for that corner of the quad are 3 SLCN latitude and 4 SLCN longitude.”

“Very good,” said Biff. “Now give me the declination between star, or true, North and magnetic North.”

“The declination is 5 SLCN.”

They left the airport, SW sector, heading South on a road that runs parallel to the North Point Consolidated Canal.

“What class road are we driving on?” asked Bunny.

“It must be 6 SLCN [A. Heavy-duty; B. Medium-duty; C. Light duty],” Biff replied.

Just as dawn was approaching, Bunny spied a larger waterway to the West of the North Point Consolidated Canal.

“What is the name of that waterway?” asked Bunny, pointing to the right.

“It’s called the 7 SCLN,” said Muffy. “I wonder what that symbol on either side of the canal represents.”

Biff peered over at the quad and replied, “It must be a 8 SLCN.”

“What is the most likely source of the water?”

“Well, Skip, maybe part of it comes from the 9 SLCN [A. swamp; B. submerged marsh; C. mangrove] in the NW corner of SW sector 7,” answered Biff.

The road on which they were traveling dead-ended at North Temple Street. They turned left and headed toward Salt Lake City.

“How far is the Jordan River?”

“From where we turned onto this street to the river is 10 SLCN miles,” answered Biff.

After traveling about two miles on North Temple Street, they crossed Redwood Road, which is State Route 11 SLCN.

“I wonder if our Navigator’s altimeter is accurate. Does the quad give us any indication as to our present elevation?”

“There’s a bench mark at the Jordan River that shows our elevation as 12 SLCN.”

“Which direction is the river flowing?”

“Although it meanders a bit, its basic direction of flow is 13 SLCN [A. East; B. West; C. North; D. South],” Muffy replied.

Glancing at the map’s lower right-hand corner, Bunny exclaimed, “Look! The State Capitol Building is located in sector 14 SLCN!”

“I can see the dome of the State Capitol Building ahead of us!” exclaimed Skip.

“Since traffic is light, stop on the Jordan River Bridge. I’d like to check our compass,” said Biff. “Muffy, use the quad to determine the azimuth from the North Temple Street Bridge over the Jordan River to the State Capitol Building.”

Muffy, using a protractor and a ruler, calculated the azimuth and said, “It’s 15 SLCN degrees to the center of the Capitol Building. And, no, I didn’t forget to figure in the declination.”

“We are off by one degree,” Biff stated in disbelief.

“When was the map last photorevised?” asked Skip.

“In 16 SLCN.”

“That explains the error. The location of the Magnetic North Pole is constantly drifting. We must keep that in mind.”

Continuing on North Temple Street, they came to I-15, their route to the South. There was no entrance at this point, so they continued traveling Eastward. About 0.3 miles past I-15, they came to 17 SLCN [A. railroad tracks; B. dam; C. state boundary]. At 3<sup>rd</sup> West Street, they turned left and proceeded to 6<sup>th</sup> North Street where they again turned left, which meant that they were actually going West. At I-15 they came upon an entrance to the Interstate. They turned 18 SLCN [A. right; B. left; C. up] to get on to I-15 South.

Proceeding on South I-15, they quickly parted the Salt Lake City North quad. They took out the Utah Highway Map.

“Skip, you spoke to Baxter the longest. Where did he say to go?” asked Bunny.

“Baxter said we’d be heading South to a small town called Salina. Jimbo’s plane went down somewhere South of there,” Skip replied.

“Using the Utah Highway Map grid, Salina is in **19 HM** [A. J-3; B. K-6; C. F-5; D. G-4], Muffy said.

“What’s the population of Salina?” inquired Biff.

“The population is **20 HM**, and it is in **21 HM** County,” Muffy informed them.

“How far is it from the State Capitol Building in Salt Lake City to Salina?” asked Skip.

“It’s about **22 HM** miles. We can stay on I-15 for most of the trip. We’ll turn off I-15 and onto US-50 at the town of Scipio.”

When they reached Provo, they saw a large lake to the right. Muffy identified the lake as **23 HM**.

Near Spanish Fork [H-7], a black Corvette merged onto I-15 and pulled alongside. Skip spotted sunlight reflecting from the barrel of a weapon. Knowing full well that he couldn’t outrun the Corvette, he ordered everyone to hold on as he braked hard. The Navigator did a 360 and ended up behind the Corvette. The driver of the Corvette was not at all pleased with this unexpected turn of events and decided it was time to accelerate. Bunny, reacting quickly, leaned out the window and with two shots flattened the rear tires of the Corvette. The car nearly rolled, but the skillful driver managed to pull the vehicle onto the shoulder of the Interstate.

“Let’s keep going,” said Biff. “We don’t have time for a firefight.”

“I hope they don’t know where we’re heading,” Muffy muttered in a concerned tone.

“What kind of terrain surrounds Salina?” Skip asked.

“It’s practically surrounded by **24 HM** National Forest,” Muffy replied.

“But, is it flat?”

“Not really. Mt. Hilgard [L-7], in the Eastern part of Fishlake National Forest, reaches an elevation of **25HM**.”

As they continued on I-15 South, they caught up with two eighteen wheelers traveling side-by-side. The trucks were gradually reducing their speed.

“They’re trying to slow us down. That’s quite likely a tactic to give someone else time to catch up. I’ll pass them on the shoulder,” said Skip hesitantly.

As Skip attempted to pass on the shoulder, one of the semis tried to cut him off, almost forcing him to veer down a steep embankment.

“Whomever’s back there will be on top of us before we arrive at the next exit. Even if we happen to make it, I’m certain they’ll be someone waiting for us. Let’s see what this Navigator can do!”

Skip sought out a flat area and parted I-15 without the benefit of an exit. Attempting to remain out of sight of the Interstate, he managed to travel parallel to it while maintaining a Southerly course. The team soon arrived at a small town called Mills [I-6 on the high way map] and stopped to purchase a soda at a convenience store. Here they took a moment to discuss their options.

Skip tossed in a suggestion that they four-wheel it on a straight course to Salina. He asked, “What azimuth would that give us?”

Biff calculated the azimuth as **26 HM** degrees, but added, “If we go straight through, we’ll have to cross the **27 HM** Reservoir. I don’t think that’s a very good idea. If we follow the road out of Mills, heading East, we can cross I-15 near exit number **28 HM** and be on U-78 in no time.”

Muffy added, “We can take U-78 to U-28, turn South, and stay on it to Salina. It is exactly **29 HM** miles from the intersection of U-78 and U-28 to Salina.”

In Salina, they stopped. No one seemed concerned that they may have been followed, even though they had spotted a small yellow plane on two separate occasions.

Biff turned on the receiver and picked up a signal so faint that he estimated it to be coming from a distance of at least ten miles. He informed his team that the signal appeared to be coming from the South.

“Luckily, Baxter had included the Gooseberry Creek quad,” Muffy said. “Jimbo’s plane probably went down somewhere in the area covered on that quad.”

They took a secondary road out of Salina and soon came to Gooseberry Creek. Aware that they were now in NW sector 1, they stowed the highway map.

“What kind of stream is Gooseberry Creek?” asked Biff.

Bunny, consulting the quad, replied that it was a/an **30 GC** [A. perennial; B. intermittent; C. oxbow] stream.

They continued traveling along this road which soon changed from a secondary, medium-duty to a light-duty road. When they reached the Gooseberry Campground, C sector 5, they parted the road and continued on a jeep trail.

“Skip, slow down. I have to carefully monitor the receiver!” exclaimed Biff.

“In which sector is the Gooseberry Campground?” asked Bunny.

“It’s in sector **31 GC**.”

About fifteen minutes later, Biff asked Skip to stop the Navigator. “Jimbo is close. He should be right over there,” he said as he pointed toward the Southeast.

Muffy, who had been following their progress on the map, said, “Jimbo must be near the Hamilton Reservoir in S sector 8.”

The team left the Navigator and, with Biff leading the way, started toward the Hamilton Reservoir. On the South side of the Reservoir they found Jimbo. In addition to suffering a broken ankle, he was running a fever and his speech seemed slurred.

“We’re not alone,” muttered Jimbo. “For the past hour or so I have been hearing voices. I’ve been very careful to remain silent and hidden.”

Skip, surveying the area, said, “We can’t bring the Navigator in here, and it would be nearly impossible to carry you out without our being spotted. We’ll have to call for air evacuation.”

“The lake isn’t large enough for a sea plane to land, so we need a chopper with pontoons,” suggested Muffy.

“What’s the elevation of the lake?” asked Biff.

“The contour interval of the Gooseberry Creek Quad is **32 GC** and the **33 GC** [A. index; B. intermediate; C. supplementary] contour closest to the Hamilton Reservoir has a value of **34 GC** feet. The water elevation must be **35 GC** [A. higher than; B. the same as; C. lower than] the value of the contour,” Bunny explained.

“The motion detector indicates four moving objects approaching our position. Those objects could be deer, but they’re most likely human,” Muffy whispered.

Skip whispered, "Spread out as quickly and quietly as possible. If they are subversives, neutralize them with tranquilizers. We have to capture them alive if at all possible."

Within minutes, four villainous-appearing men emerged from the woods about 100 yards from the agents. They walked along the water's edge, moving straight toward Jimbo's hiding place. Upon Skip's signal, the team neutralized the villains. It had taken but a few seconds. Aware that the tranquilizer would soon wear off, the agents disarmed their captives and bound them to nearby trees.

"Call Baxter," Muffy said to Bunny. "Ask him to send a helicopter large enough to carry five passengers. Be sure to request a helicopter with pontoons and to bring along a doctor for Jimbo plus several guards for our prisoners. Tell him we'll set off flares at the Southernmost point of the Hamilton Reservoir to assist in landing."

Jimbo handed the microdot to Biff. The helicopter soon arrived, picked up its cargo, and parted. The team returned to their Navigator and headed back toward Salina.

"We had best contact Langley to assure them that the microchip is safely in our hands," Skip remarked. "I'm certain they're worried. We'll contact them via satellite to assure security. Our best bet is to set up our transmitter near the gaging station in C sector 5. Besides that, it's right on our way."

At the gaging station, Skip asked, "Could someone please calculate the exact coordinates so we can connect with the satellite?"

Within a few moments, Bunny recited the coordinates as 36 GC latitude and 36 GC longitude.

Following the transmission, they awaited instructions. "Proceed to 38° 51' 19" North; 111° 44' 16" West. Remain there for further instructions borne by a woman wearing a windbreaker."

"Exactly where are we going?" asked Biff.

"The coordinates match those for a 37 GC in sector 1," Bunny replied.

They headed for the meeting place. Within thirty minutes, a woman wearing a puce-colored windbreaker arrived on a "Hog". She instructed them to go to the Provo Municipal Airport where a jet would be awaiting their arrival. Baxter would meet them there to pick up the Navigator.

The trip from Salina to Provo proved uneventful. As they approached the city, Muffy consulted the highway map to scan the Provo inset.

Muffy said, “I didn’t know that **38 Provo Inset** University was in Provo.”

Glancing at Muffy, Skip asked, “What’s the number of the nearest exit to the Provo Municipal Airport?”

“That would be exit number **39 Provo Inset**.”

“I wonder if the Utah Lake State Park has camping facilities. I’d love to return here someday for a vacation,” commented Bunny.

“**40 Provo Inset** [A. yes; B. no; C. maybe],” answered Muffy.

Baxter was waiting for the jubilant team. He informed them that Jimbo was doing well, and that the subversives had been thrown into the slammer.

Baxter complimented the team on a job well done as he led them to the awaiting Lear Jet. Once on the plane, the team realized just how exhausting their day had been. They fell into a deep sleep as the plane headed back East to Virginia.

**The End**

## Mountain Rescue

1. 1:24,000
2. Farmington
3. 40° 45' M
4. 112° W
5. 15.5°
6. B [Medium-duty]
7. Surplus Canal
8. Levee with road
9. A [swamp]
10. 2.5 – 2.65 [2.57]
11. U-68
12. 4225'
13. C [North]
14. 9 [SE]
15. 075 – 079 [077]°
16. 1975
17. A [railroad tracks]
18. A [right]
19. B [K-6]
20. 1943
21. Sevier
22. 139 miles [ $\pm$  6]
23. Utah Lake
24. Fishlake
25. 11,527'
26. 161 – 171 [166]°
27. Sevier Bridge
28. 207
29. 43 [ $\pm$  1]
30. A [perennial]

## Answer Key

31. 5 [or C]
32. 40'
33. B [intermediate]
34. 9720'
35. C [lower than]
36. 38° 47' 57" N - 111° 40' 54" W  
38° 48' 07" N - 111° 41' 04" W  
38° 48' 20" N - 111° 40' 59" W
37. Spring
38. Brigham Young
39. 268
40. A [yes]

### Maps used in this exam:

Utah Highway Map, Rand-McNally  
Salt Lake City North Quadrangle, Utah  
Gooseberry Creek Quadrangle, Utah

To purchase a set of USGS quads and  
Highway map for "Mountain Rescue,"

Please visit:

<http://www.otherworlds-edu.com>

## Mountain Rescue

The following abbreviations are used to identify the maps used during this exam:

**SLCN** = Salt Lake City North, Utah

**GC** = Gooseberry Creek Quad, Utah

**HM** = Highway Map, Utah

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## Student Response Sheet

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35. \_\_\_\_\_
36. Latitude: \_\_\_\_\_  
Longitude: \_\_\_\_\_
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