

# Apollo 13






### Apollo 13 Launch



The mission started as for Apollo 8, 10, 11 and 12 with a spectacular launch of the mighty Saturn V rocket.

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### The Astronauts

CM Pilot	Commander	LM Pilot
		
Jack Swigert	Jim Lovell	Fred Haise

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### Reality and Hollywood




The story of the Apollo 13 accident, and the heroic efforts of those in Mission Control to get the three astronauts safely back to Earth, was immortalised by Hollywood in the 1995 film ...

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# Apollo 13

### The Actors

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### Reality and Hollywood

The story of the Apollo 13 accident, and the heroic efforts of those in Mission Control to get the three astronauts safely back to Earth, was immortalised by Hollywood and also by ...

LEGO !

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### LEGO Apollo 13



APOLLO 13  
LEGO Ideas Project  
492 pcs

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### LEGO Mission Control



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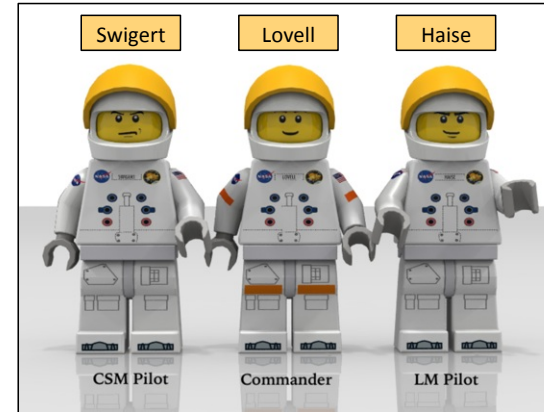
8

# Apollo 13

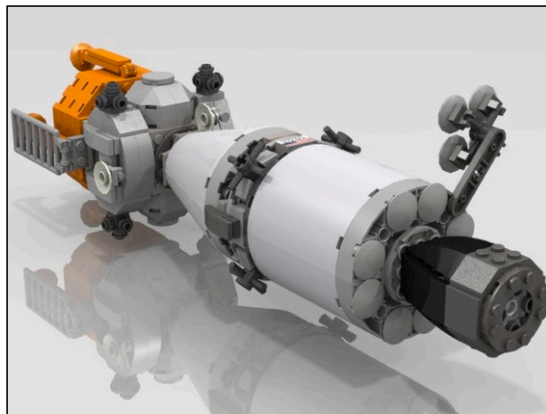
## LEGO Mission Controllers



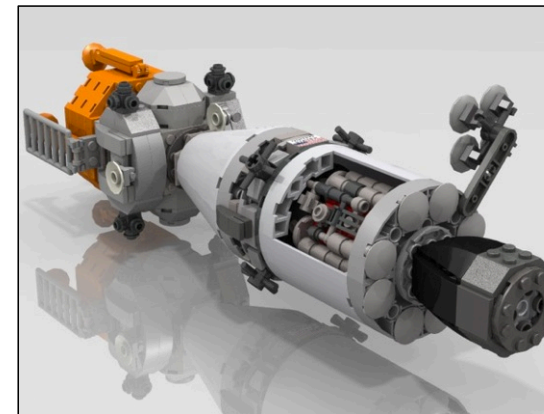
## LEGO Astronauts



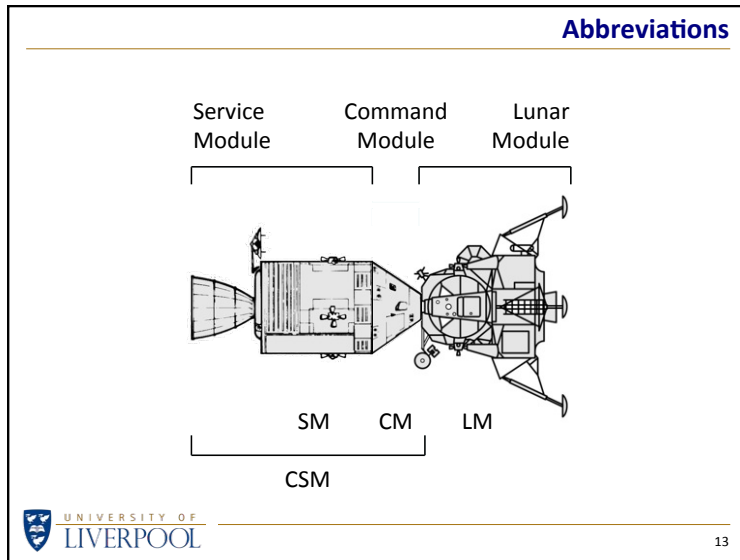
## Pre-Explosion



## Post-Explosion



# Apollo 13



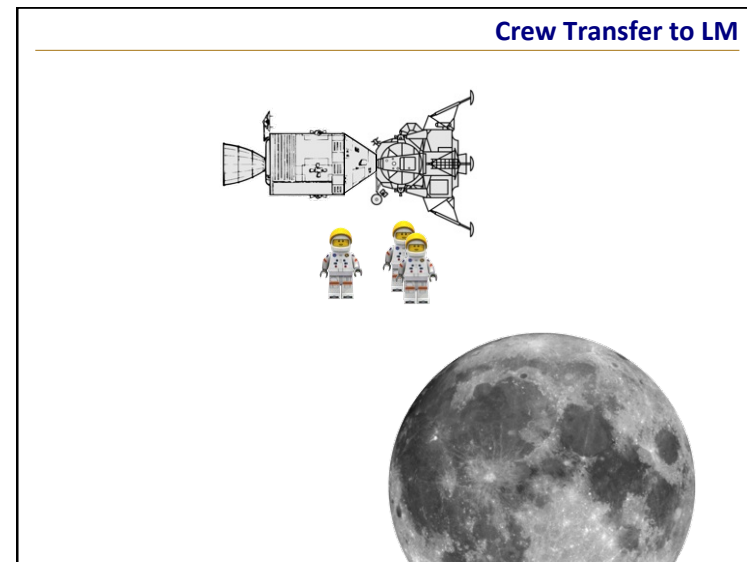
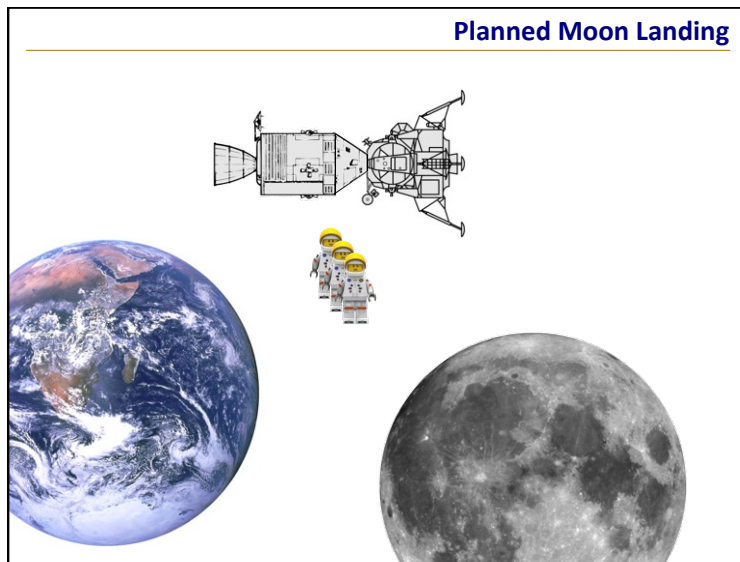
### The Mission

The mission ...

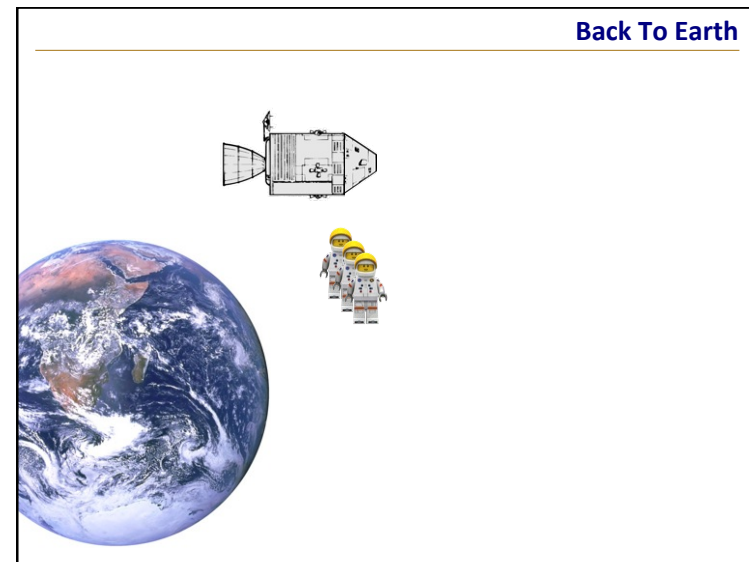
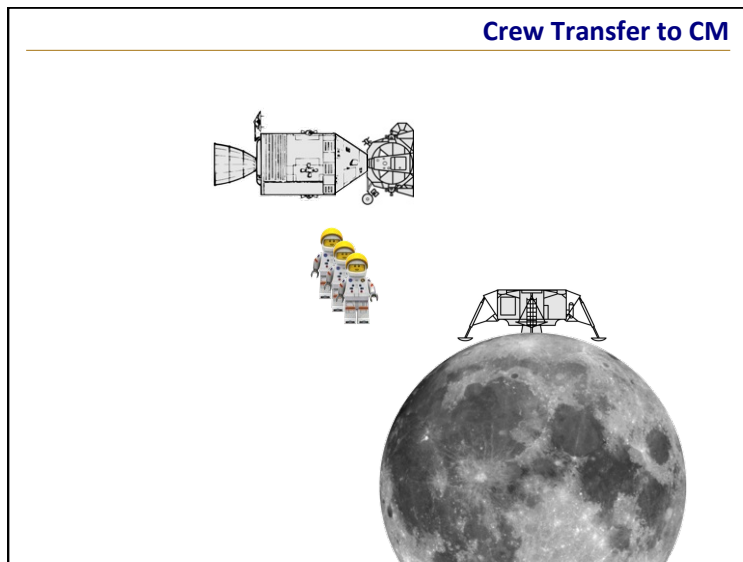
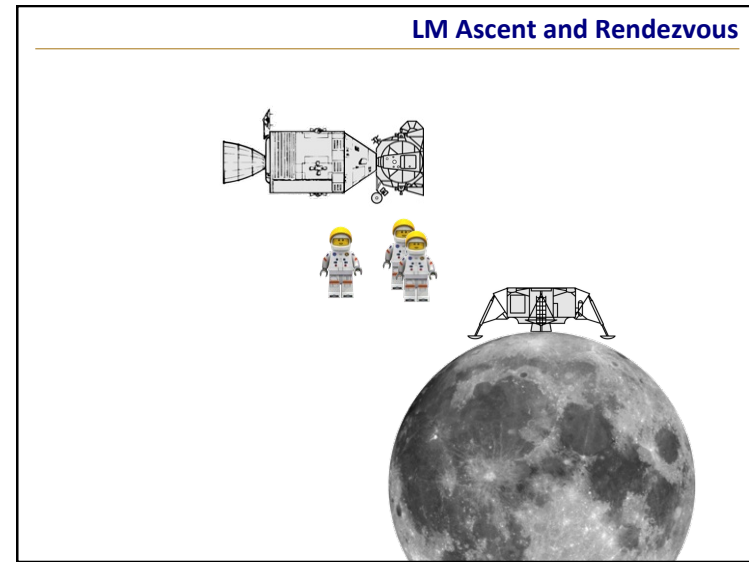
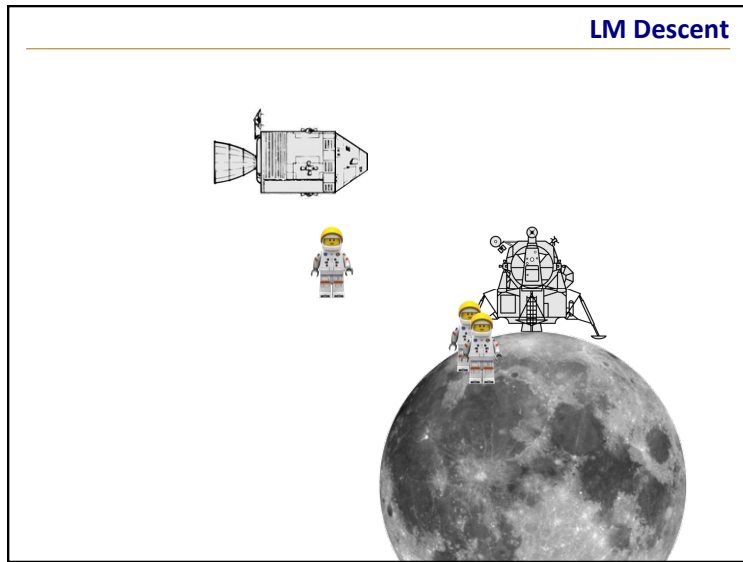
... as it was supposed to happen

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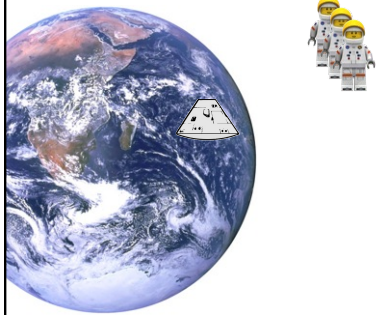


# Apollo 13



# Apollo 13

## Splashdown

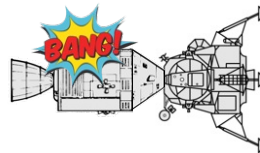


## The Mission

The mission ...

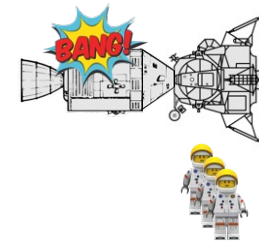
... as it actually happened

## Houston, We've Had a Problem



A fan inside one of the oxygen tanks had faulty wiring insulation, so when the tank was stirred a spark caused the oxygen tank to explode, damaging the fuel cells and blowing out a side panel of the SM.

## Into the LM Lifeboat

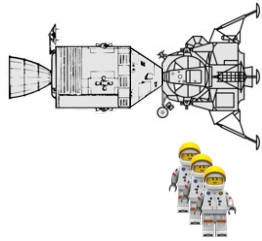


Contingency plans for a three-day flight returning from the Moon with a crippled CSM had been thought about, but Apollo 13 was at least four days from Earth.



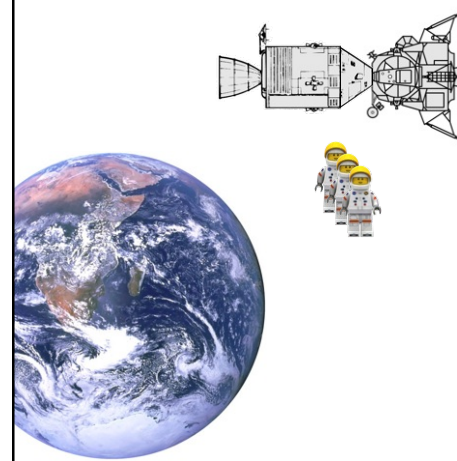
# Apollo 13

## Survival Mode

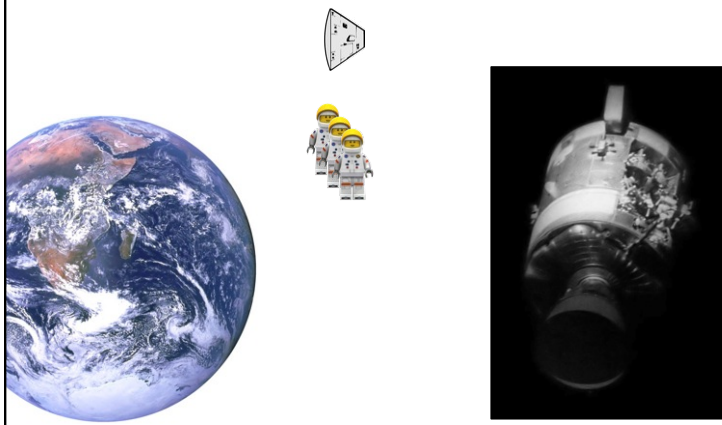


How could they ensure that the remaining oxygen, water and electrical power would last long enough to get them home safely?

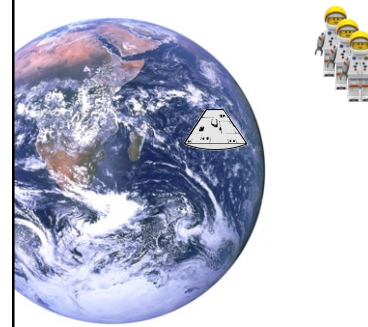
## Crew Transfer to CM



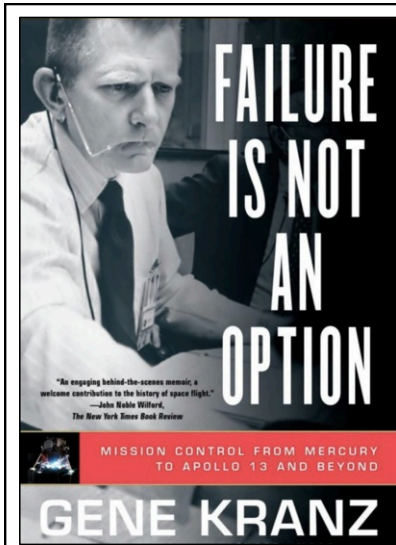
## SM and LM Jettisoned



## Splashdown



# Apollo 13



## Gene Kranz

That famous phrase was spoken by actor Ed Harris but not by Kranz himself.

However, Kranz used it for his autobiography because it reflected so succinctly the attitude of those working in Mission Control.

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## What Happened To ...?

The Command Module (call sign 'Odyssey') made it safely back to Earth with its three occupants.

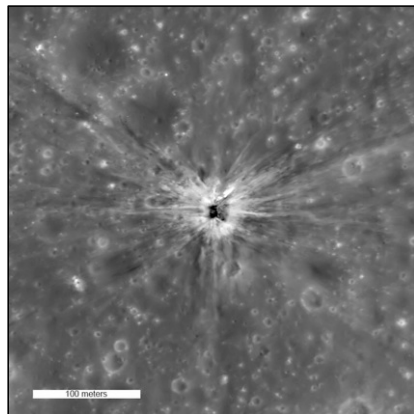
What about the rest of the Apollo hardware?

The third stage of the Saturn V rocket, after it had accelerated the CSM+LM spacecraft towards the Moon, was given one last task to perform ...



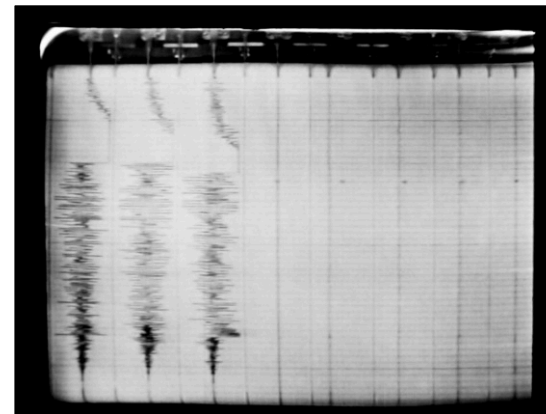
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## Saturn S-IVB Impact Site



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## Apollo 12 Seismometer



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# Apollo 13

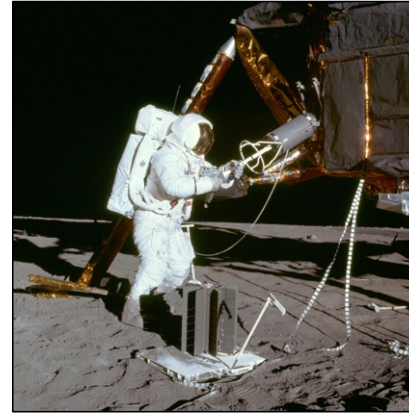
## What Happened To Aquarius?

After the Lunar Module (call sign 'Aquarius') was jettisoned it re-entered the Earth's atmosphere and disintegrated.

However, it was important to ensure that its re-entry was controlled to ensure that any surviving components fell into the deepest Pacific trench.

In particular ...

## Plutonium Power



Alan Bean (Apollo 12) removes the plutonium fuel cask from the LM to transfer it to the RTG in front of him that powers the experiments on the lunar surface.

RTG = Radioisotope  
Thermoelectric  
Generator

## Jim Lovell and Tom Hanks



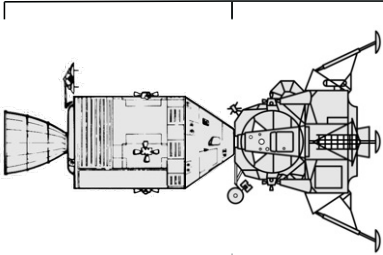
## Read All About It!



# Apollo 13

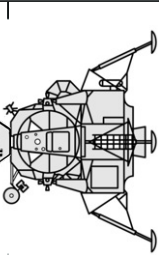
### Who Made What

Command and Service Modules




North American Rockwell

Lunar Module

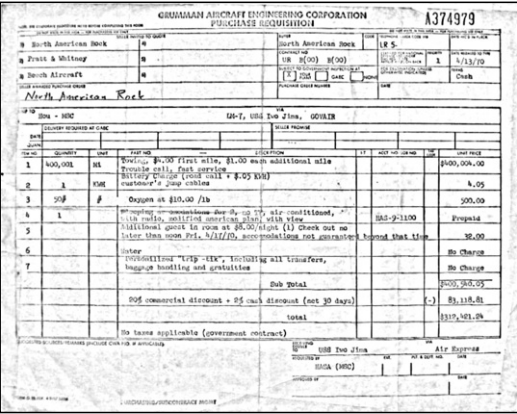



Grumman Aerospace



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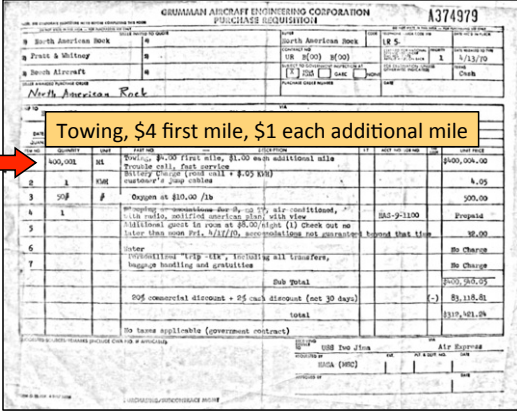
### Grumman Invoice To North American






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### Grumman Invoice To North American

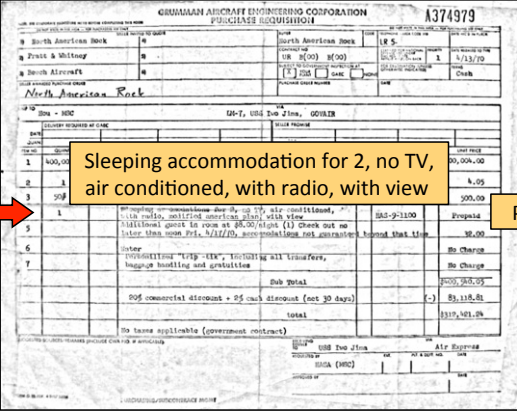


Towing, \$4 first mile, \$1 each additional mile




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### Grumman Invoice To North American



Sleeping accommodation for 2, no TV, air conditioned, with radio, with view

Prepaid



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# Apollo 13

## Grumman Invoice To North American

GRUMMAN AIRCRAFT ENGINEERING CORPORATION PURCHASE REQUISITION 1374973									
To: North American Rock		From: North American Rock		Date: 1/13/70		Part: 1		Class: 1	
To: Frank & Whitney		From: Frank & Whitney		Date: 1/13/70		Part: 1		Class: 1	
To: North Aircraft		From: North Aircraft		Date: 1/13/70		Part: 1		Class: 1	
Description of Item: <i>North American Rock</i>									
Quantity: 1 Unit: 1									
Unit Price: \$100,000.00									
Total Price: \$100,000.00									
Additional guest in room at \$8/night									
Total: \$118.80									

## Epilogue – Recovery of Odyssey



## Epilogue – NASA's Finest Hour



APOLLO 13

[www.liverpool.ac.uk/~sdb/Talks](http://www.liverpool.ac.uk/~sdb/Talks)

Dr Steve Barrett  
SU3A 26 Nov 2020