

# 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.

2

### The Astronauts

CM Pilot	Commander	LM Pilot
		
Jack Swigert	Jim Lovell	Fred Haise

UNIVERSITY OF LIVERPOOL

3

### 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 ...

UNIVERSITY OF LIVERPOOL

4

# Apollo 13

### The Actors

CM Pilot	Commander	LM Pilot
		
Jack Swigert	Jim Lovell	Fred Haise

UNIVERSITY OF LIVERPOOL

5

### 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 !

UNIVERSITY OF LIVERPOOL

6

### LEGO Apollo 13



APOLLO 13  
LEGO Ideas Project  
492 pcs

UNIVERSITY OF LIVERPOOL

7

### LEGO Mission Control

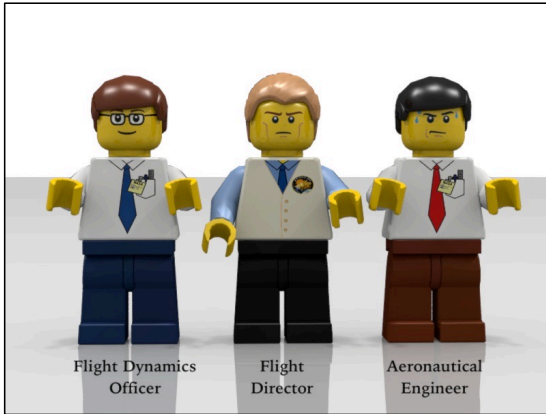


UNIVERSITY OF LIVERPOOL

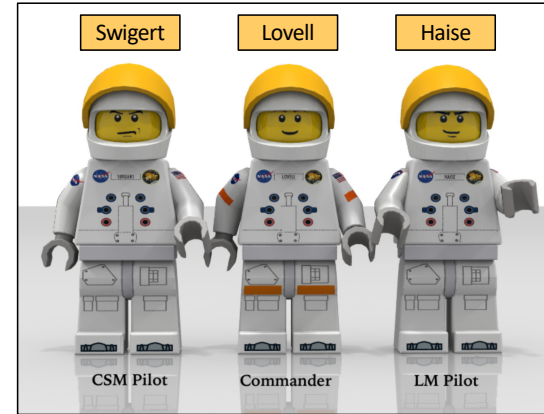
8

# Apollo 13

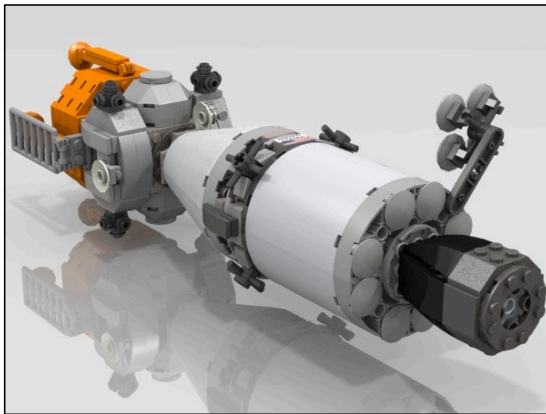
## LEGO Mission Controllers



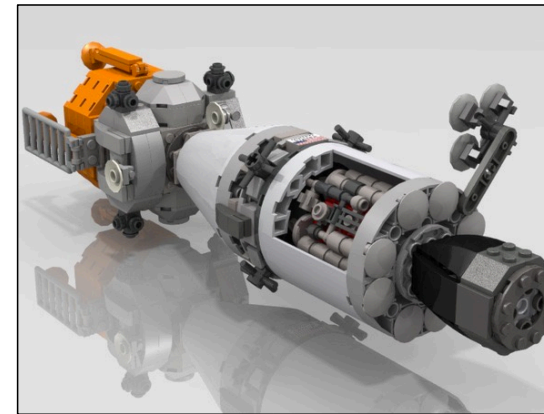
## LEGO Astronauts



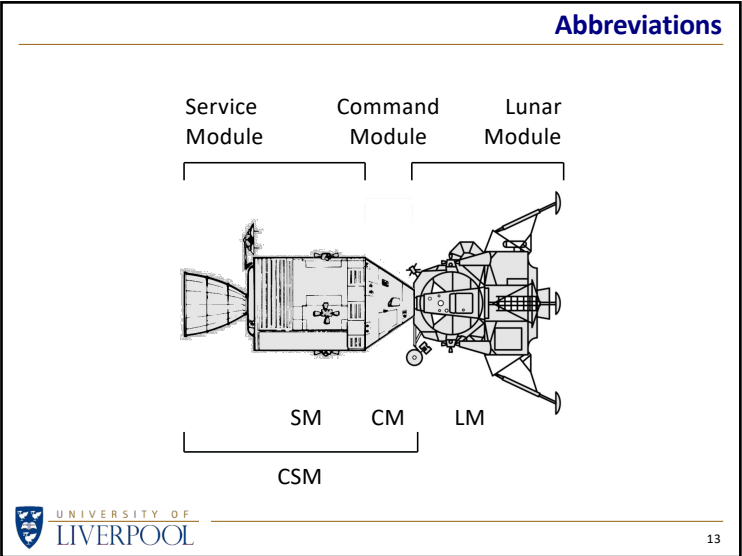
## Pre-Explosion



## Post-Explosion



# Apollo 13



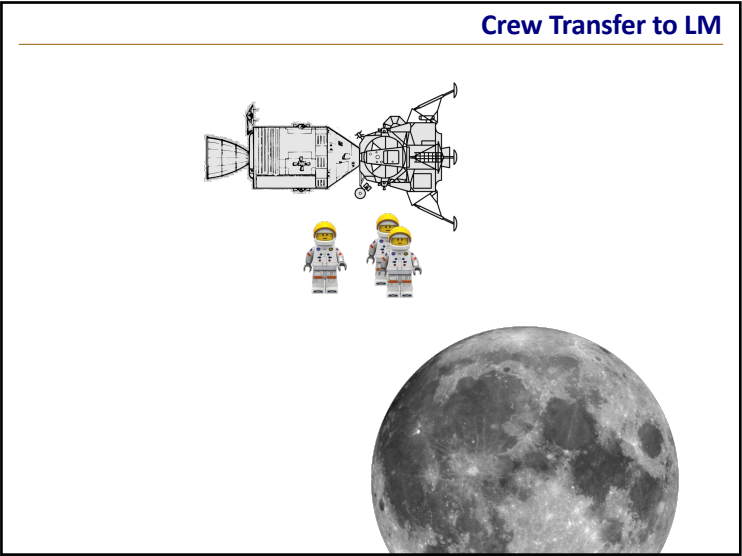
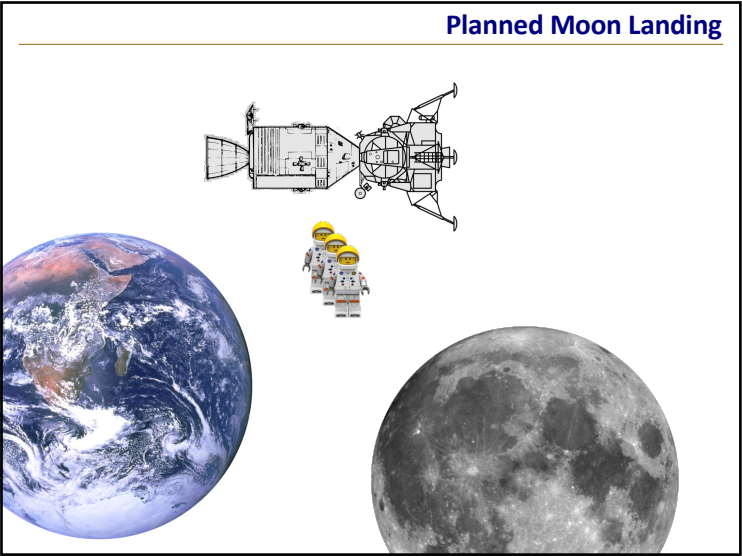
### The Mission

The mission ...

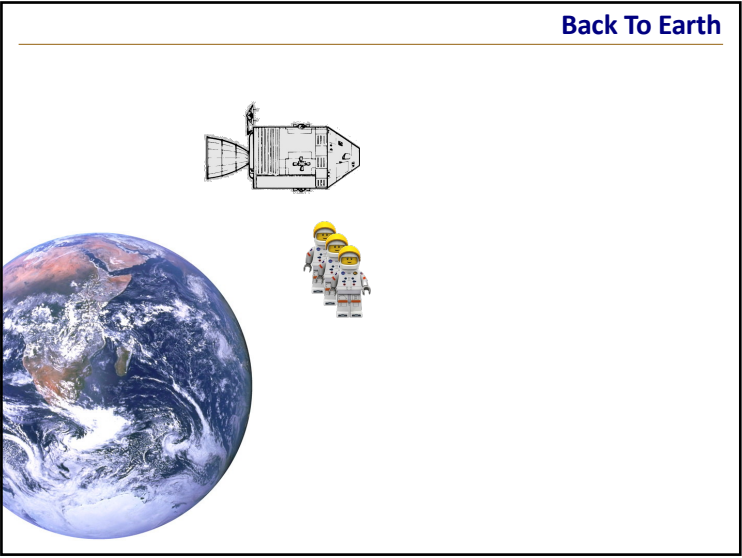
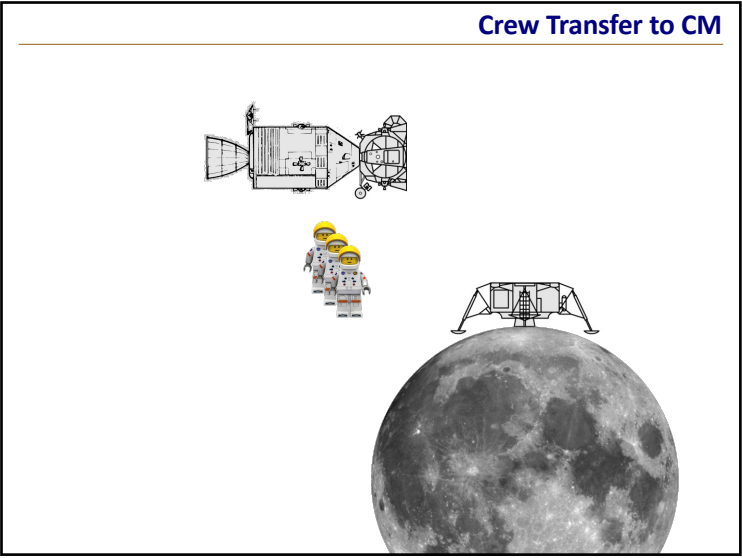
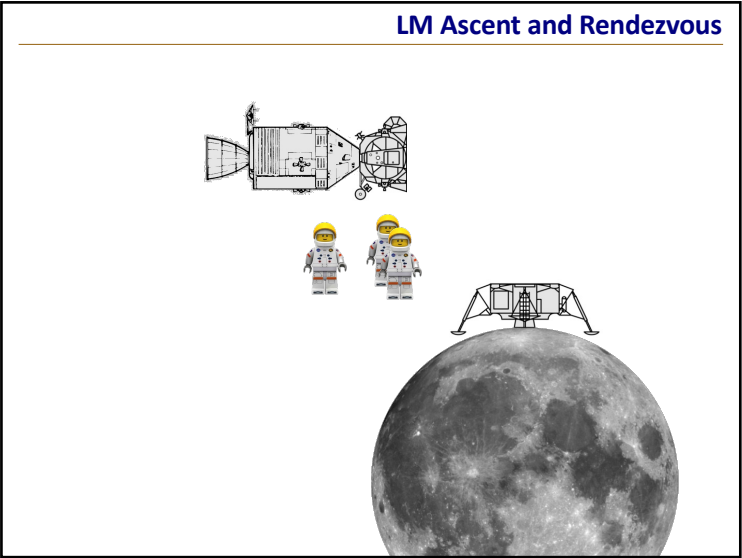
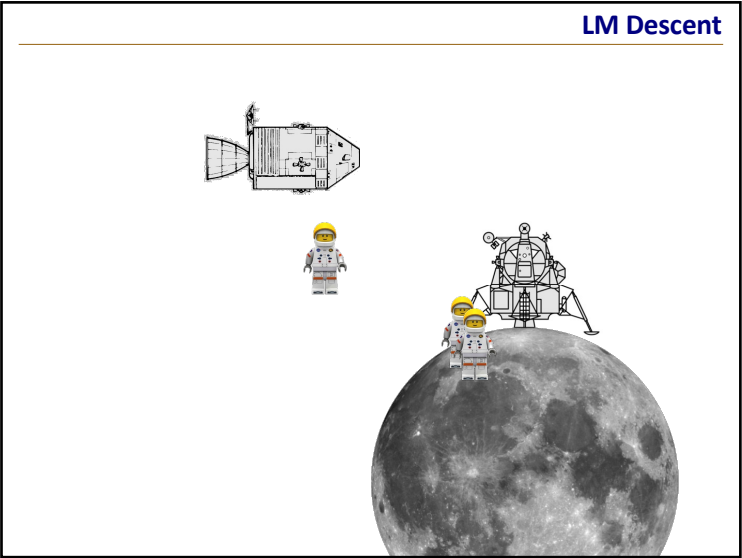
... as it was supposed to happen

UNIVERSITY OF LIVERPOOL

14

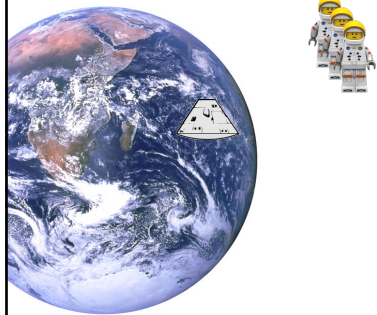


# Apollo 13



# Apollo 13

## Splashdown

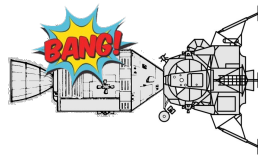


## The Mission

The mission ...

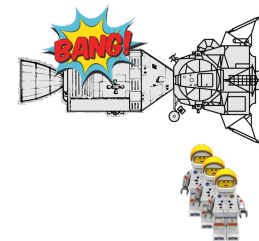
... as it actually happened

## 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

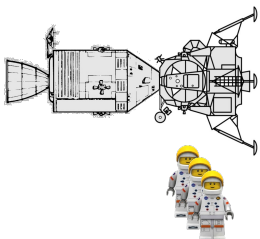


Contingency plans for a three-day flight returning from the Moon with a crippled CSM had been thought about, but Apollo 13 was at least four days from Earth.



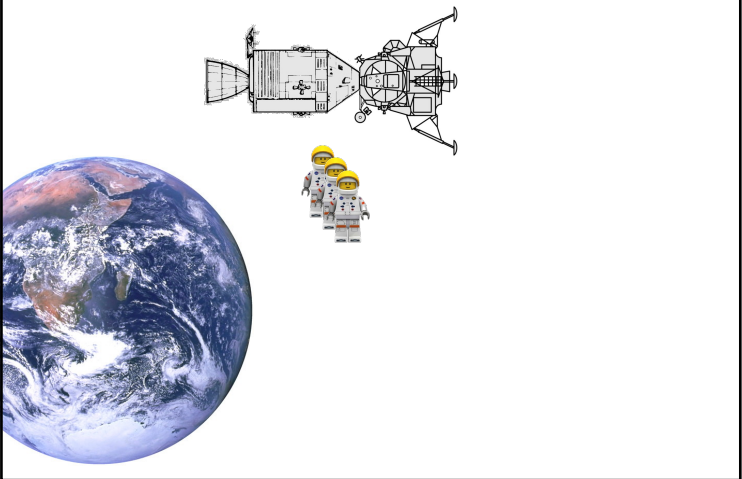
# Apollo 13

**Survival Mode**

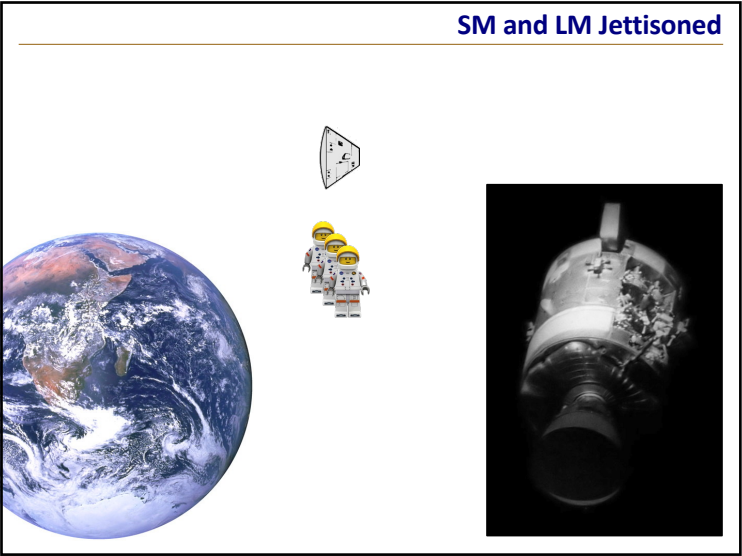


How could they ensure that the remaining oxygen, water and electrical power would last long enough to get them home safely?

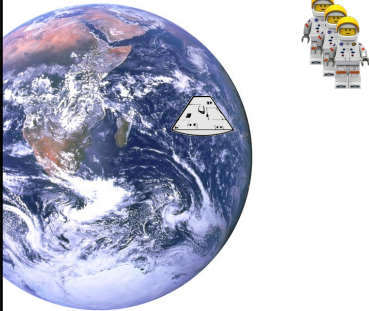
**Crew Transfer to CM**



**SM and LM Jettisoned**

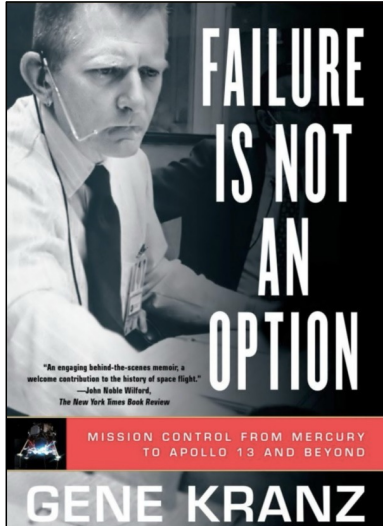


**Splashdown**



# 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.

29

**What Happened To ...?**

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

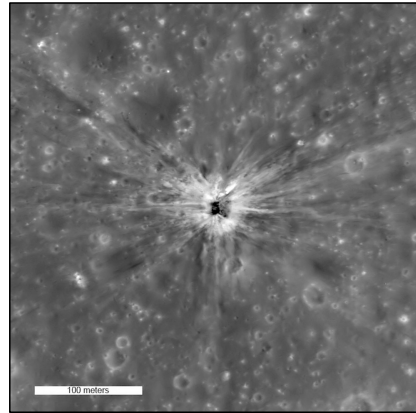
What about the rest of the Apollo hardware?

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 ...

UNIVERSITY OF LIVERPOOL

30

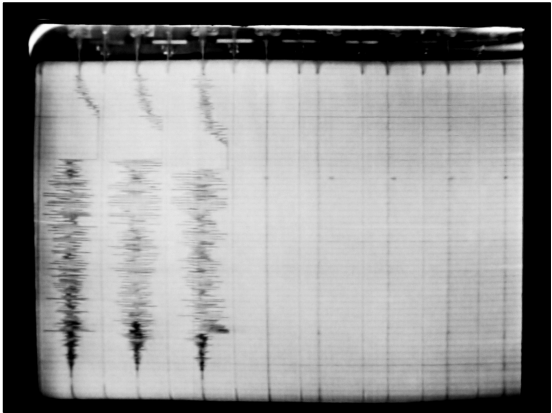
**Saturn S-IVB Impact Site**



UNIVERSITY OF LIVERPOOL

31

**Apollo 12 Seismometer**



UNIVERSITY OF LIVERPOOL

32



# Apollo 13

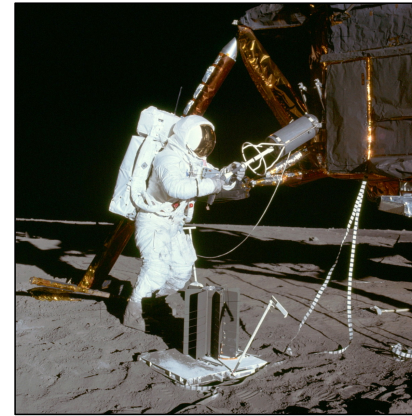
## What Happened To Aquarius?

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



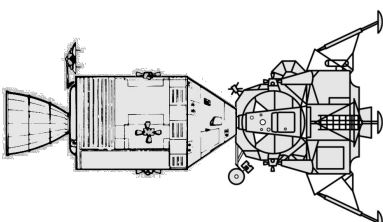
## Read All About It!



# Apollo 13

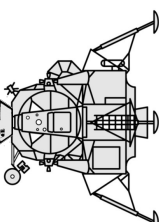
### Who Made What

Command and Service Modules




North American Rockwell

Lunar Module

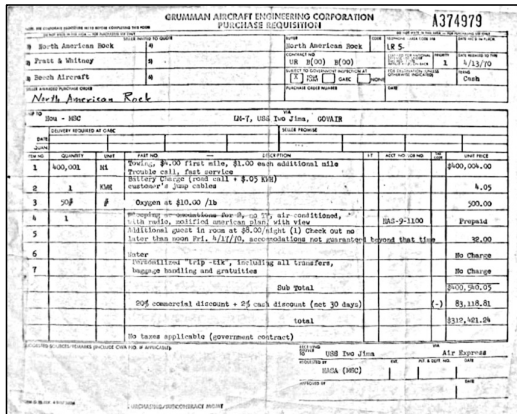



Grumman Aerospace



37

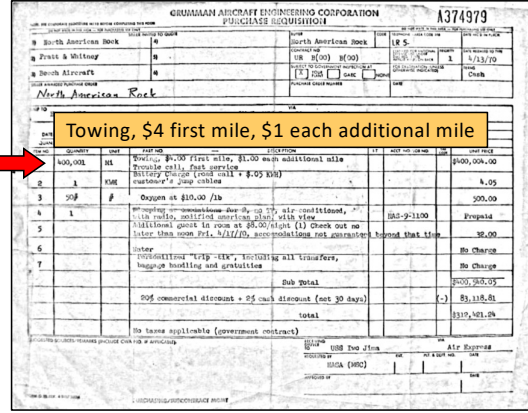
### Grumman Invoice To North American






38

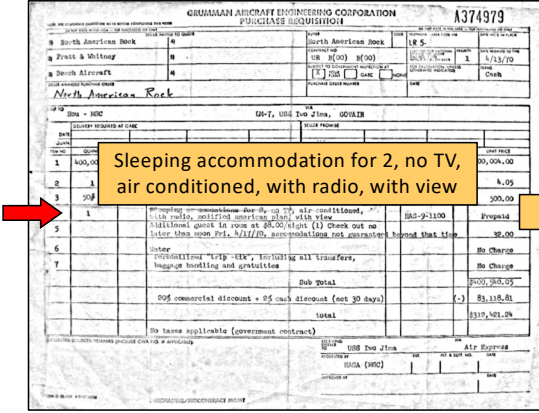
### Grumman Invoice To North American






39

### Grumman Invoice To North American





40

# Apollo 13

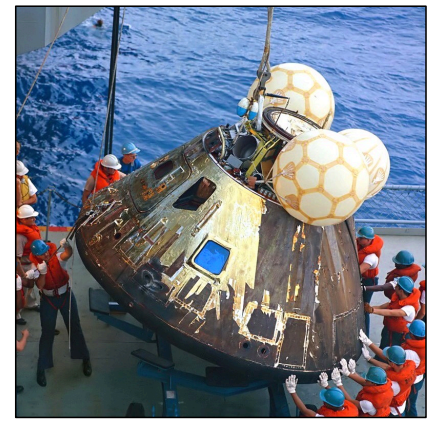
## Grumman Invoice To North American

GRUMMAN AIRCRAFT ENGINEERING CORPORATION PURCHASE REQUISITION									
North American Book					North American Book				
Fruit & Milkway					Fruit & Milkway				
Book Aircraft					Book Aircraft				
<p><b>Additional guest in room at \$8/night</b></p>									
1	100,000	RT	Rooming \$8.00 first night, \$1.00 each additional night						100,000.00
2	1	FOOD	Breakfast only, first service						4.05
3	200		Breakfast only (second night) \$4.05 each						200.00
4	1		Additional guest in room at \$8.00/night (1) Check out no later than noon Fri. 3/17/70. Accommodation not available beyond that date.						32.00
5			Water						20.00
6			Telephone "long" calls, including all transfers, message handling and gratuities						20.00
7			20% commercial discount - 25 each discount (not 30 days)						55,118.95
Total									217,181.00



41

## Epilogue – Recovery of Odyssey



42

## Epilogue – NASA's Finest Hour



Duke, Lovell, Haise, Kranz, Lunney, Griffin, Brand, Lousma, Kerwin (2015)

# APOLLO 13

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

Dr Steve Barrett  
EPRT 6 Mar 2025