

The next slide (fig. 12) shows the first thermal vacuum test article, TM-2, which is shown here being lowered into Grumman's thermal vacuum chamber, to determine the heat transfer characteristics of the vehicle. This is a very important vehicle because it provided the design information that was necessary to proceed with the lightweight thermal skin insulation and other features which determine the heat balance in the vehicle.

Chairman TEAGUE. What temperatures are involved there, approximately?

Mr. GAVIN. Well, we have to look at this vehicle from the standpoint of the lunar surface in full sunlight, to the lunar surface in full shadow, which is a range of plus or minus 300° F., approximately. When it is hot, we are trying to keep the heat out; and when it is cold, we are trying to keep the heat in. We are trying to do this in a sufficiently efficient fashion that we do not put too large a demand on the environmental control system in the vehicle.

It is a little bit like having a well-insulated house, I suppose. In any event, these lists which you can pursue in more detail by yourself, tell you what we did at Bethpage during the past year, and I suppose that we should point out a couple of things that we didn't do. We did not succeed in delivering LM-1 and LTA-8 by the end of the year, which was something that we were striving mightily to do. But also, I want to point out the list of things, which were happening at Bethpage does not include the fact that we have had astronauts here almost

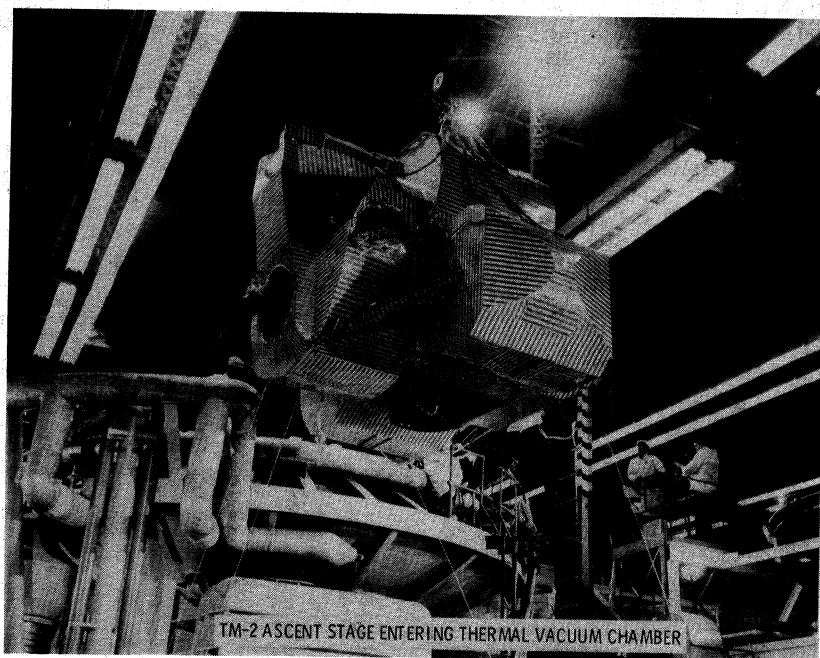


FIGURE 12