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**II. LOAD TEST SET-UP
FOR THE AIRMASS SUNBURST
ULTRA-LIGHT AIRCRAFT**

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Introduction

The purpose of this one hour AE 592 Special Project class was to set up, instrument, and test the Sunburst Ultra-Light aircraft at the Lawrence Municipal Airport for the University of Kansas Aerospace Engineering Dept. and the Center for Research Inc. (CRINC). The intentions of the project were that the aircraft would need to be suspended from the test stand, leveled in the stand, the strain gauges tested and wired to the test equipment, and finally, the aircraft would be broke to obtain the failing loads.

All jobs were completed except to break the aircraft. This notebook shows the progress of Suman, Bill, and myself as these tasks were completed and the following section attempts to explain the photographs in the notebook. All work done, was done as a team effort, so that no one person was required to do more work than the others.

Work Done

1.) The first task was that of cleaning the aircraft and equipment to be used in the test. To start this process, a gasoline powered leaf blower was used to dust the aircraft and test stand off. Next the wings and cockpit were dusted by hand. Finally, the whiffle-tree sections were assembled and dusted to determine what additional equipment was needed.

2.) The next set of tasks included setting up the scaffolding, hoisting the aircraft, hanging it from the whiffle-trees, and hanging the balance weights. The scaffolding proved very helpful in hanging the aircraft, though if it was done again, it is recommended that a second set be obtained to make the job easier. This set of tasks appeared to be difficult, but ended up being relatively easy.

3.) Leveling the ultra-light in the whiffle-trees was the next task and it proved to be just the opposite of the previous group of tasks. It looked relatively easy and ended up taking about three weeks to get an even loading on the aircraft. Most of this work was performed in the weeks following spring break.

4.) Approximately two weeks were spent to examining the strain gauges, resoldering the broken ones, and then testing the gauges with a digital multimeter. After this was done, three strain gauges were determined to be unfixable but were in locations that did not merit replacement. One was the most inboard strain gauge on the front spar and another was located on the underside of the rear spar directly over the mounting point for one of the whiffle-trees. Also at this point, the actuator was attached to

the aircraft and it was determined that new flat iron pieces would be required so that the actuator assembly would reach from plane to floor.

5.) At this point, Jerry Hanson came to the airport to help set up the test equipment and it was determined that resistors to make wheatstone bridges for strain gauges were needed. This is where the project stands at the time of this report. Some work will be performed the first week of finals so that the aircraft will be completely set up such that Suman can finish the test himself or with the help of Todd and Steve this summer or next fall.

Conclusions

The actual test was not completed in this semester due to the last minute problem of not having resistors in the last three weeks. These were the only major piece of equipment that we did not have, but when these come in, the final test of the aircraft should not take a large quantity of time.

This project proved to be very interesting and I enjoyed finally to be able to work on a project at the airport. I think I will find the work done on this airplane useful in the future, as I plan to attend law school at the University of Kansas this summer. Testing an airplane that carries with it the legal problems that this ultra-light does will give me experience that most in the legal field will not have.



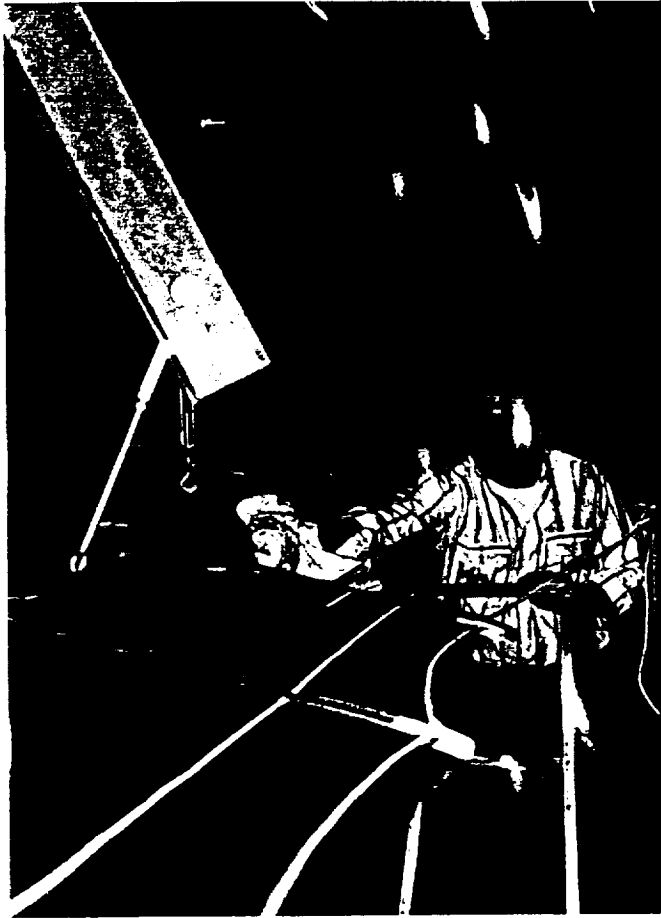
CLEANING THE ULTRA-LIGHT WITH
A POWER LEAF BLOWER





CLEANING THE ULTRA-LIGHT WITH
A POWER LEAF BLOWER





DUSTING THE WINGS AND WHIFFLE-TREES





SETTING UP THE SCAFFOLDING



HOISTING THE ULTRA-LIGHT

ORIGINAL PAGE
BLACK AND WHITE PHOTOGRAPH

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BLACK AND WHITE PHOTOGRAPH



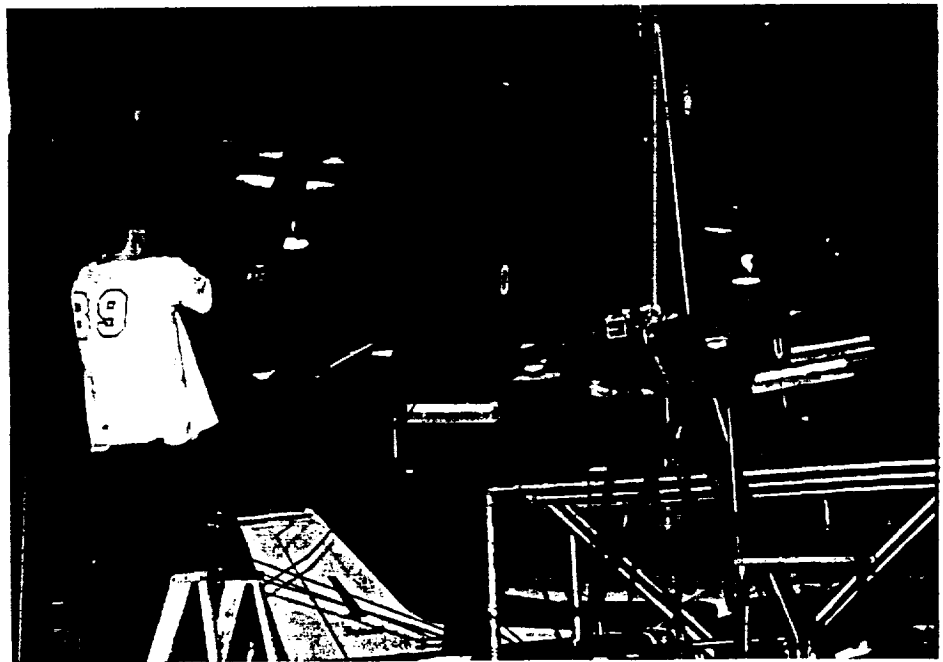
ALIGNING 2ND RANK OF WHIFFLE-TREES



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BLACK AND WHITE PHOTOGRAPH



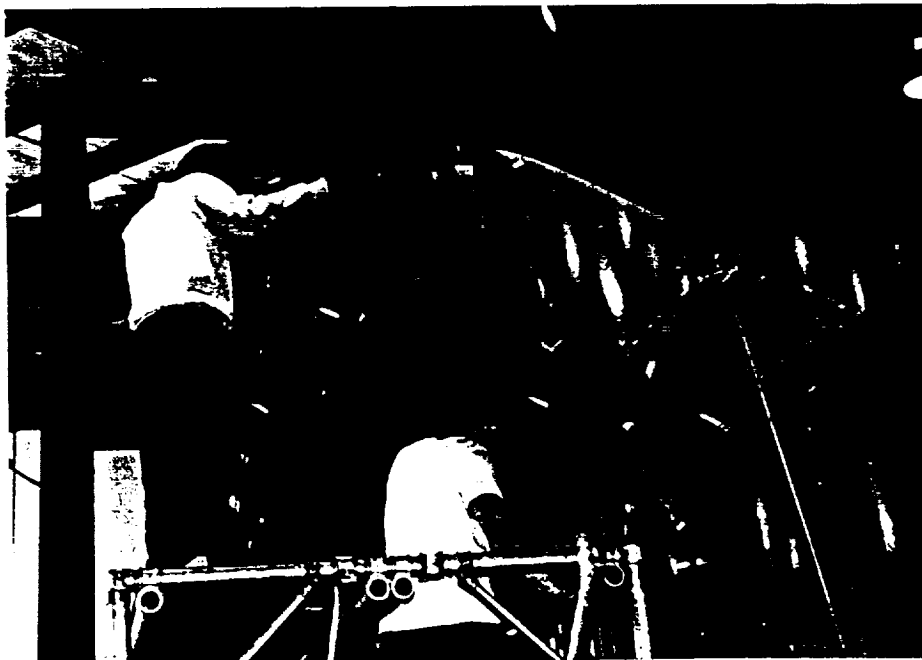
ATTACHING THE 1ST RANK OF THE WHIFFLE-TREES
TO SUSPEND THE ULTRA-LIGHT FROM THE TEST STAND



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ATTACHING THE 1ST RANK OF THE WHIFFLE-TREES
TO SUSPEND THE ULTRA-LIGHT FROM THE TEST STAND

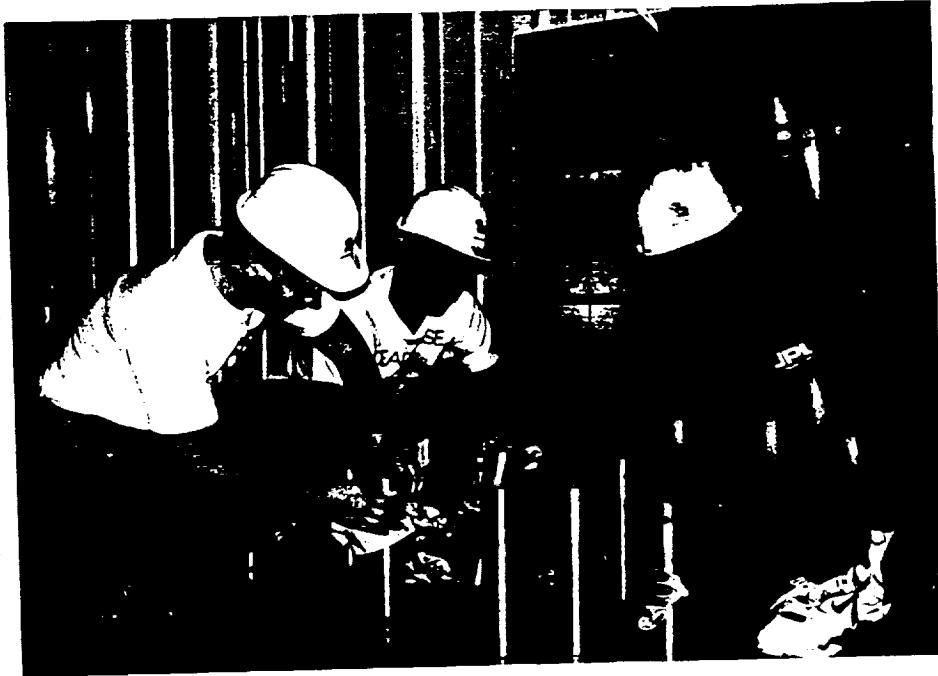


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ATTACHING THE 1ST RANK OF THE WHIFFLE-TREES
TO SUSPEND THE ULTRA-LIGHT FROM THE TEST STAND



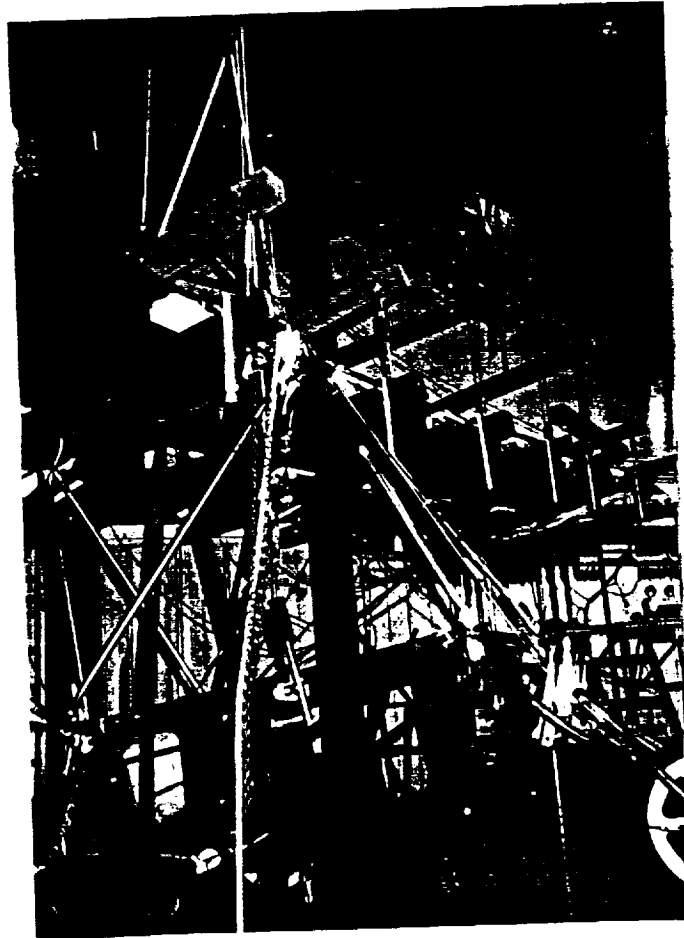


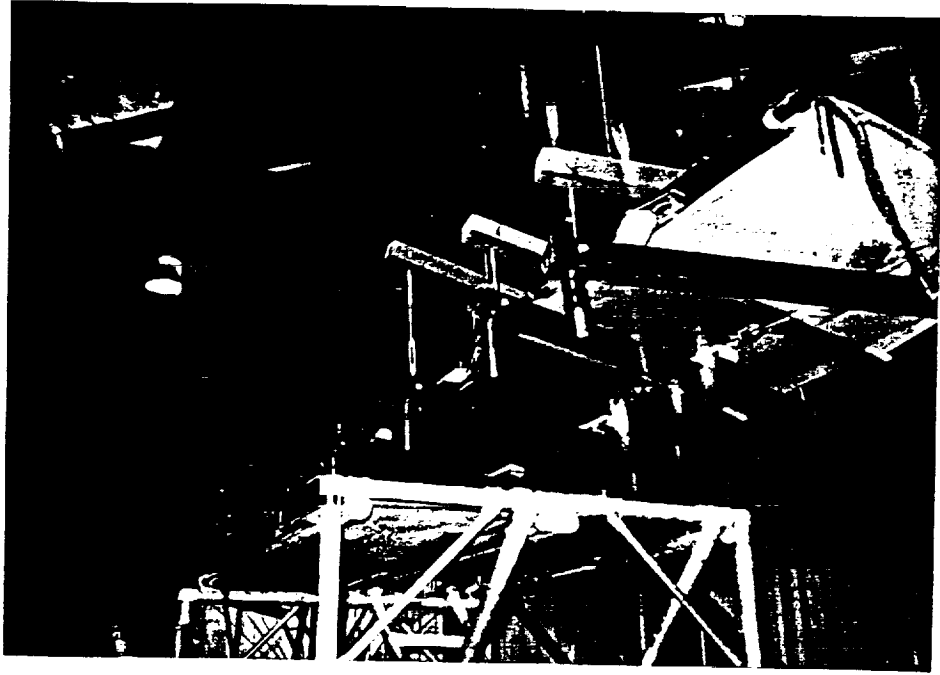
CLEANING THE BALANCE WEIGHTS
HANGING THE BALANCE WEIGHTS



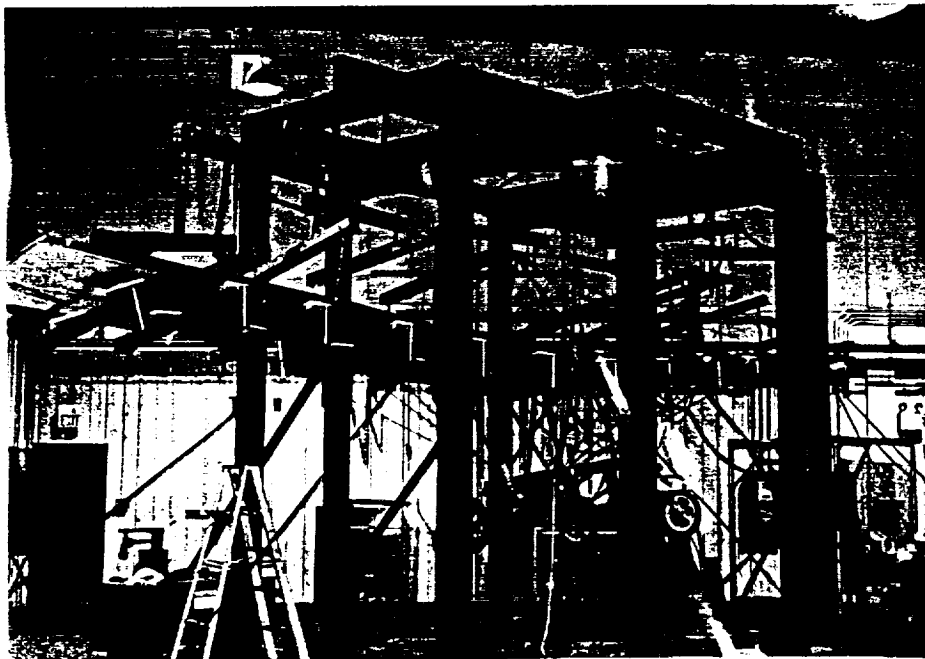


HANGING THE WEIGHTS



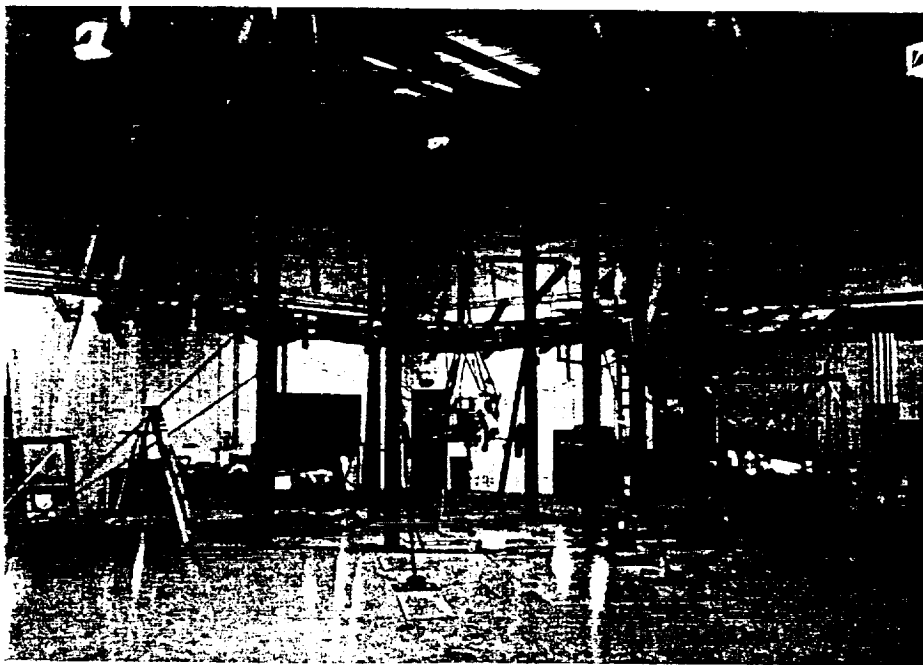


THE ULTRA-LIGHT WITH WEIGHTS HUNG





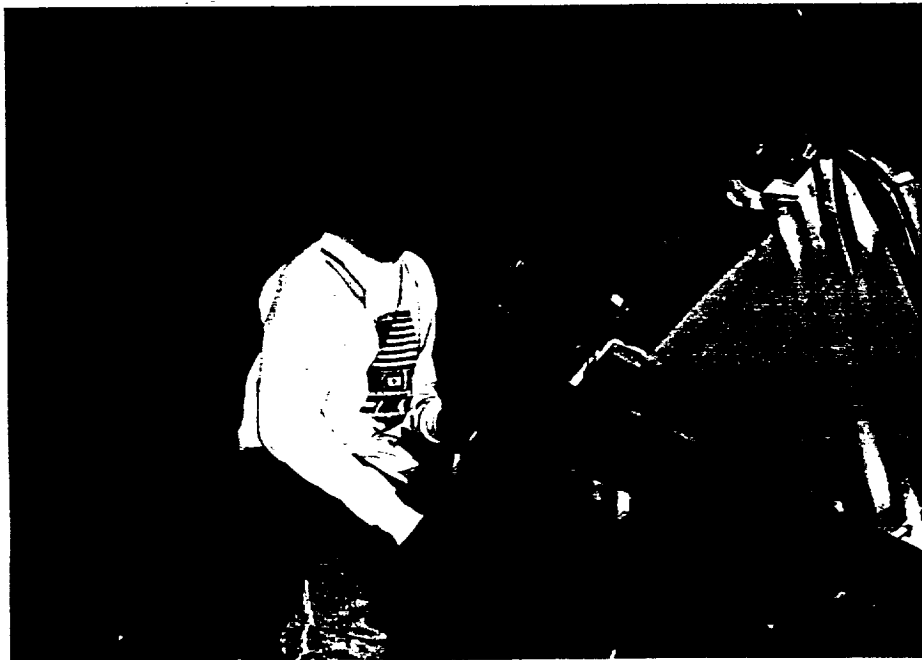
THE ULTRA-LIGHT WITH WEIGHTS HUNG



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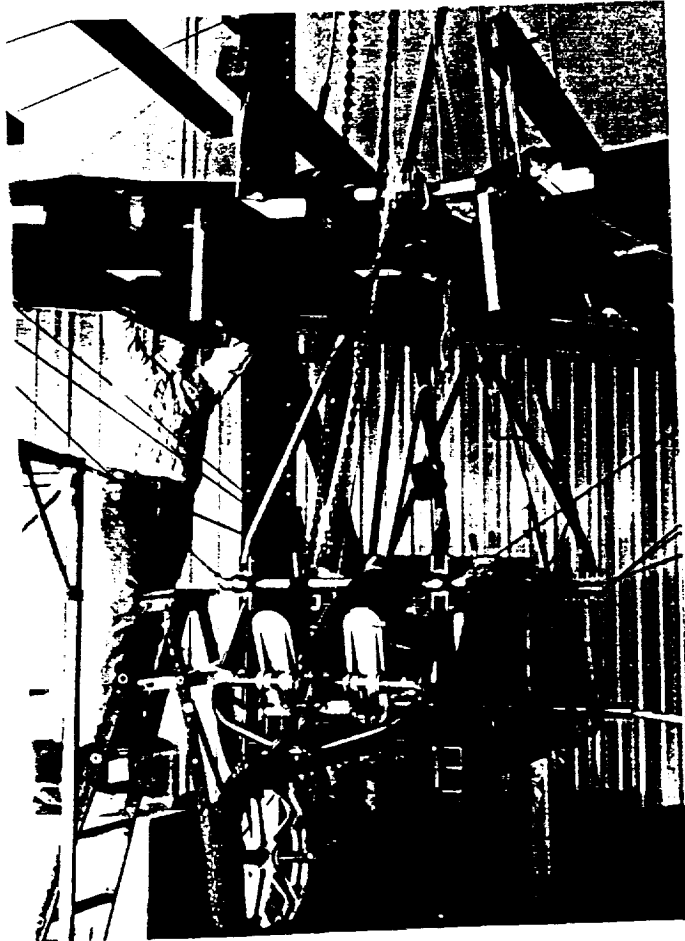
LEVELING THE ULTRALIGHT IN THE
WHIFFLE-TREES



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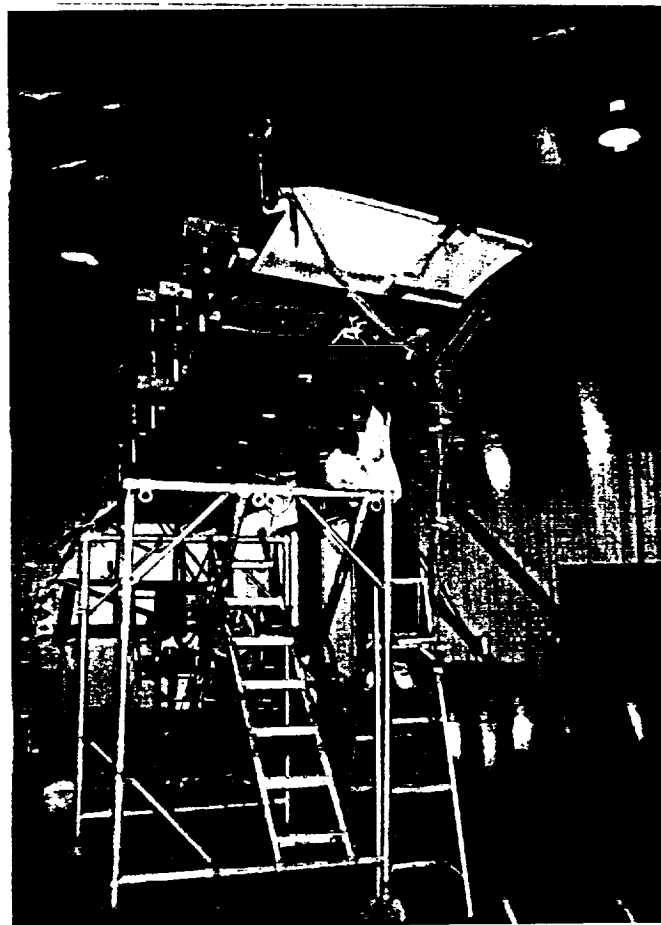
LEVELING THE ULTRALIGHT IN THE
WHIFFLE-TREES



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LEVELING THE ULTRALIGHT IN THE
WHIFFLE-TREES



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LEVELING THE ULTRALIGHT IN THE WHIFFLE-TREES



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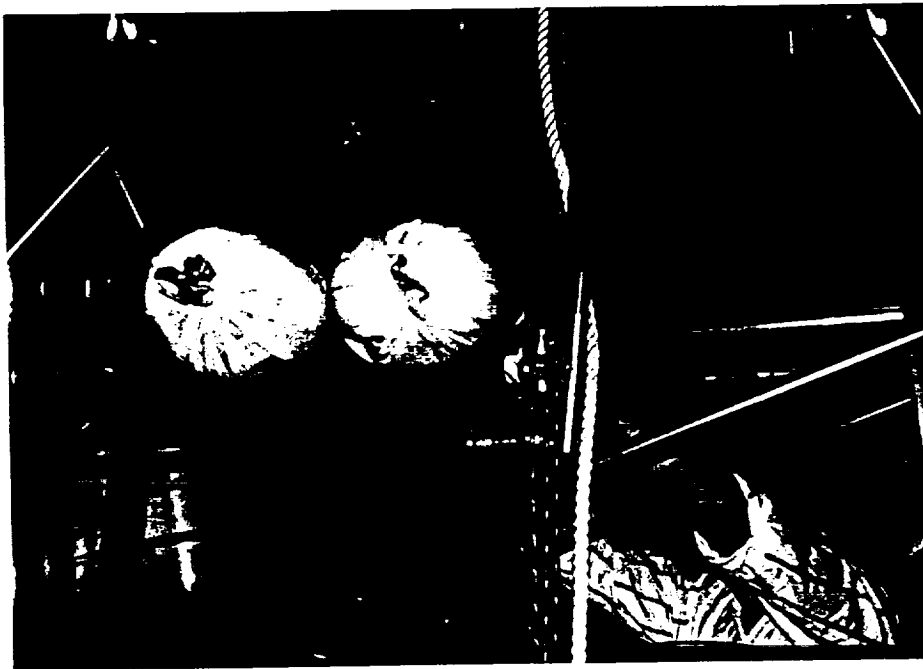


CUTTING THE TURNBUCKLES TO
TIGHTEN THE WHIFFLE-TREES





GRINDING THE THREADS ON AN EYE-BOLT



OUR ANTHROPOMORPHIC DUMMY

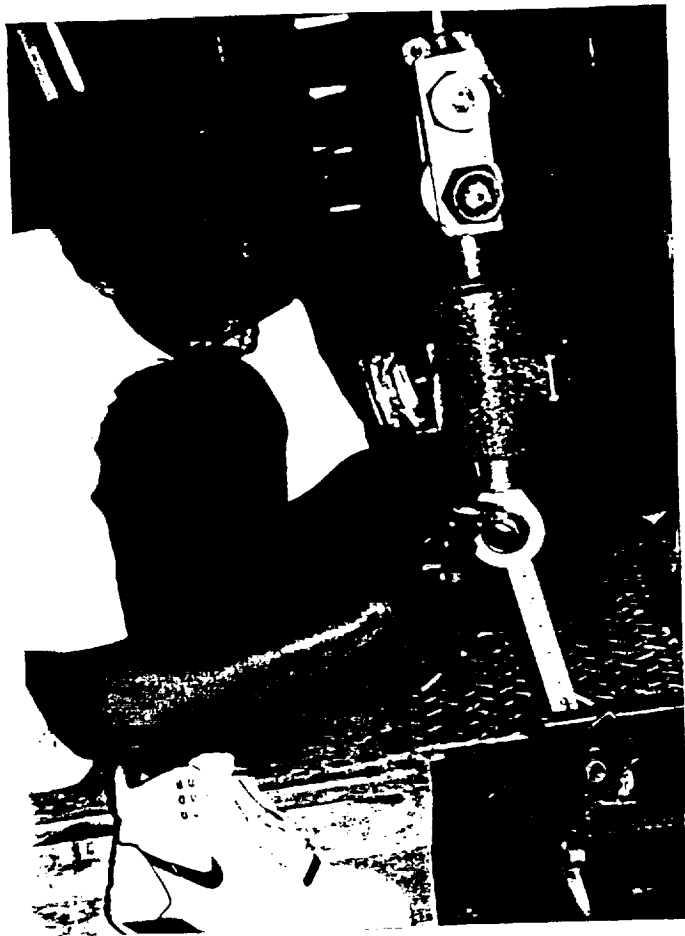
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MEASURING THE LOAD CELL
AND ACTUATOR





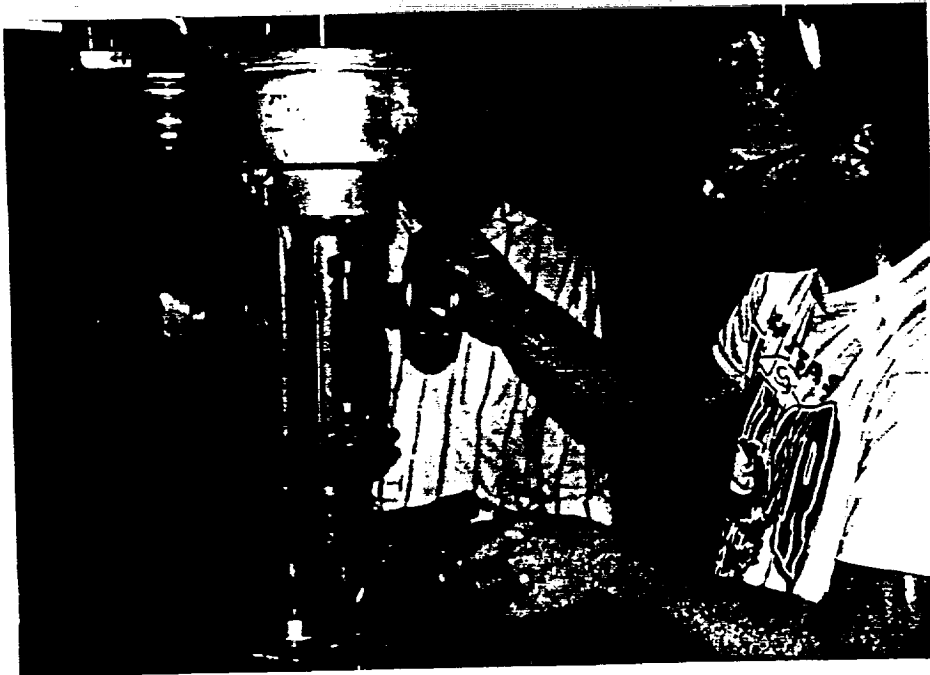
REMANUFACTURING THE ACTUATOR ASSEMBLY



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REMANUFACTURING THE ACTUATOR ASSEMBLY



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ASSEMBLING THE ACTUATOR ASSEMBLY

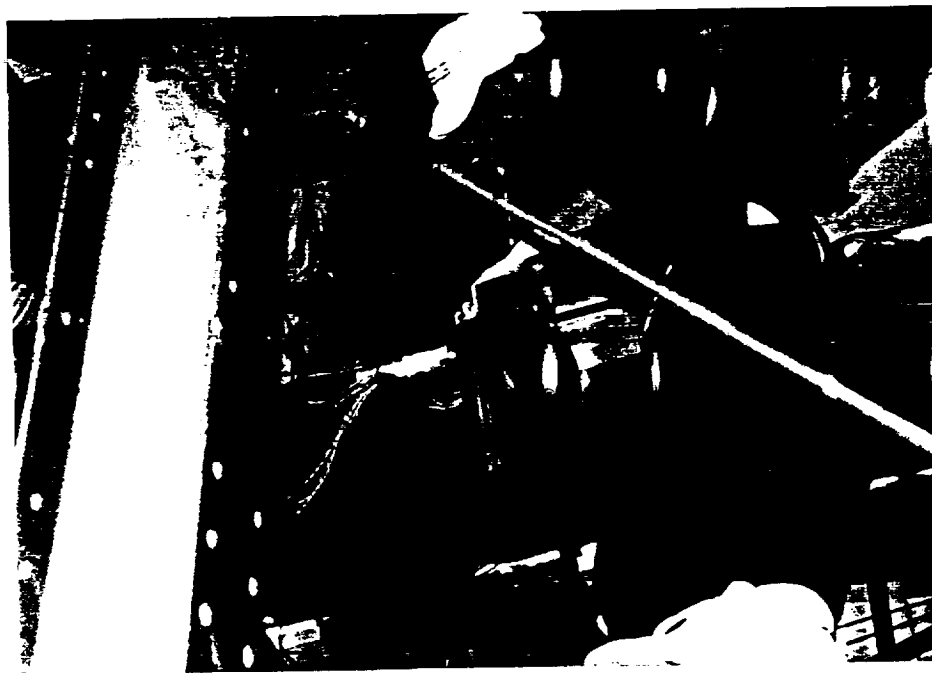


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RE-SOLDERING THE STRAIN GAUGES

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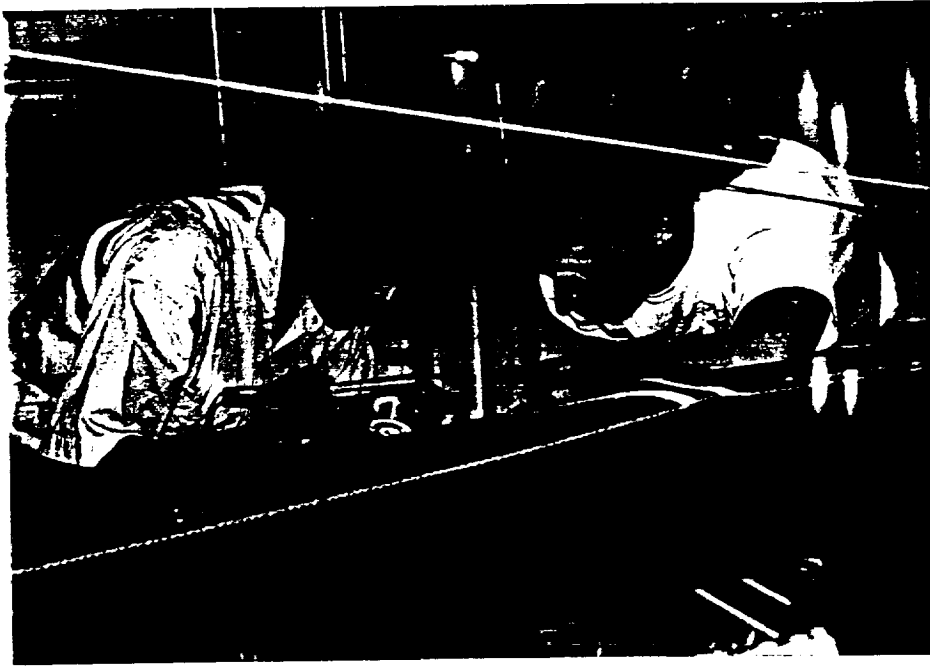
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RE-SOLDERING THE STRAIN GAUGES



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RE-SOLDERING THE STRAIN GAUGES



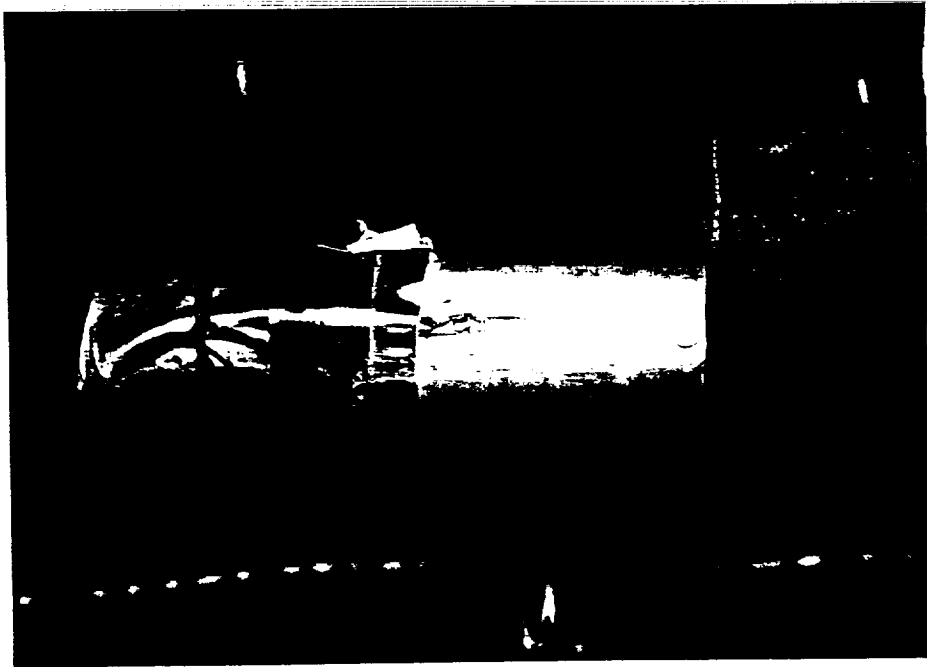


TESTING THE STRAIN GAUGES





TESTING THE STRAIN GAUGES



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SETTING UP THE TEST EQUIPMENT
(WITH HELP FROM JERRY HANSON)



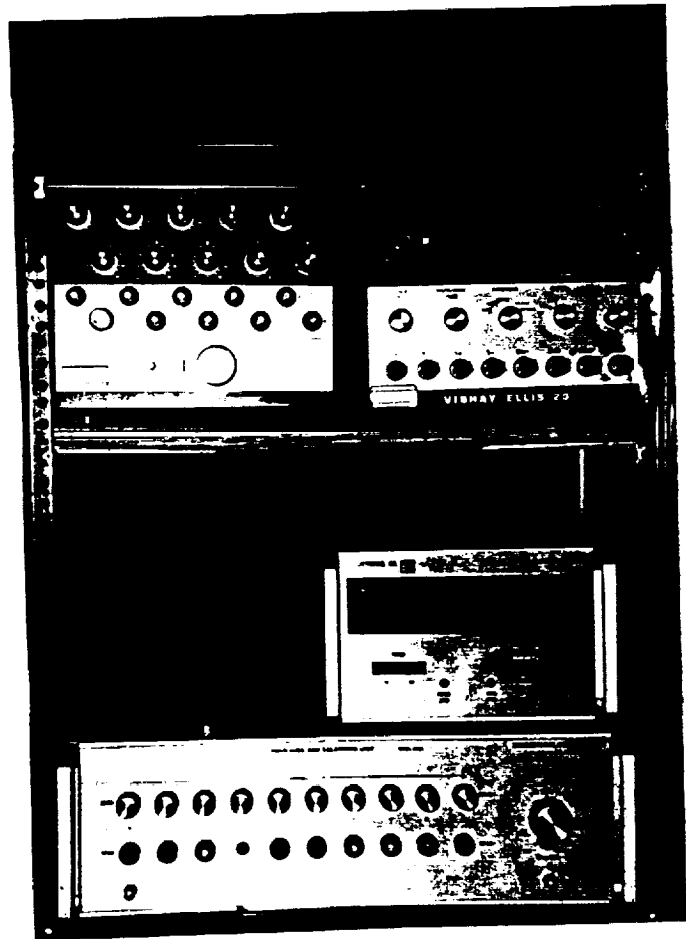
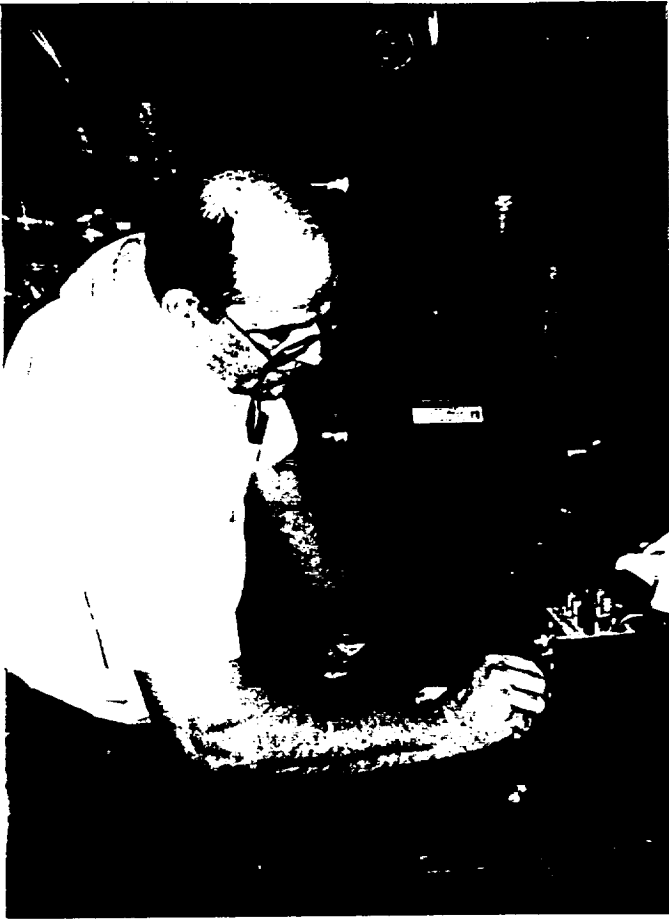
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JERRY HANSON SETTING UP TEST EQUIPMENT



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ASSEMBLING WHEATSTONE BRIDGES



SORTING STRAIN GAUGE LEADS

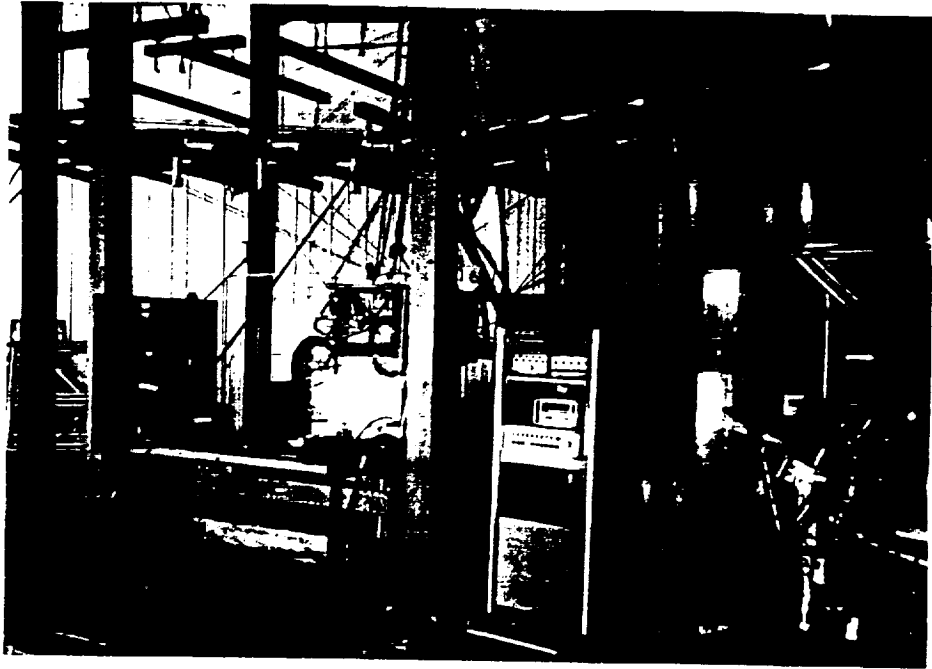
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THE AIRCRAFT BEFORE THE FINAL TEST



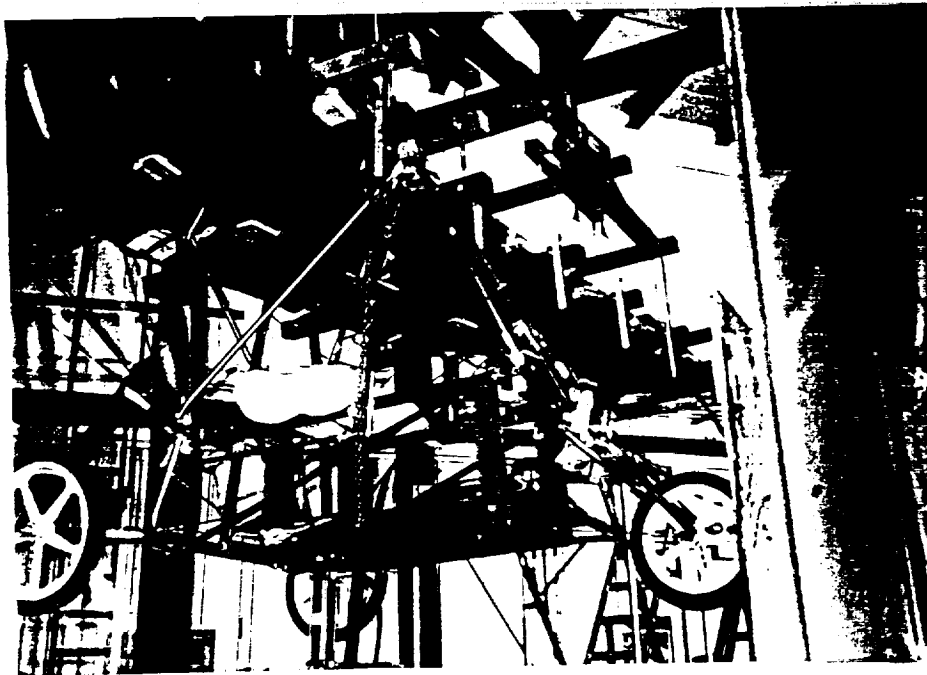
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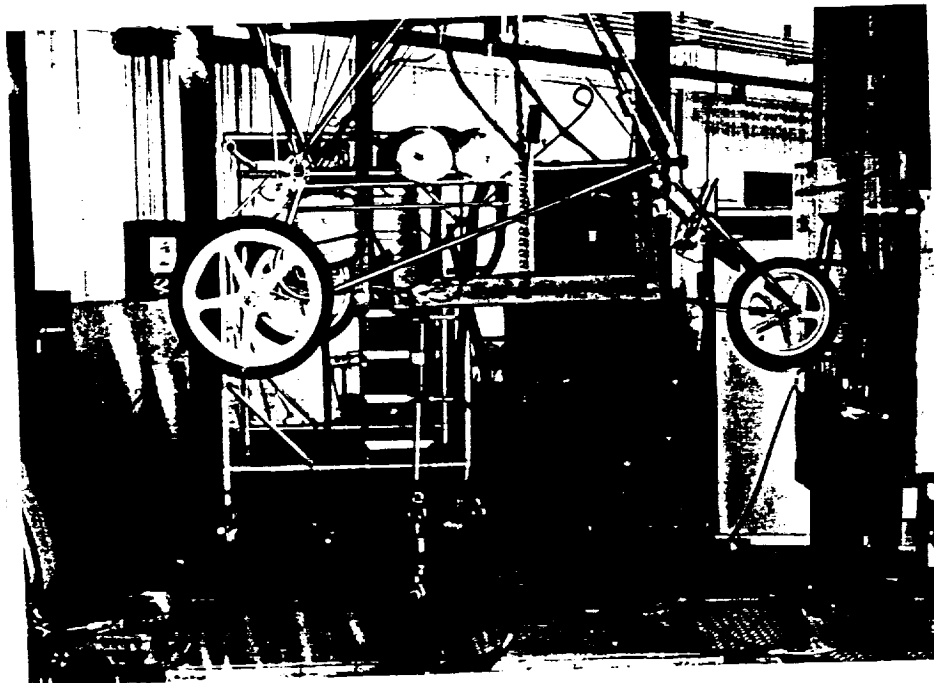
THE AIRCRAFT BEFORE THE FINAL TEST



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THE AIRCRAFT BEFORE THE FINAL TEST



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THE AIRCRAFT BEFORE THE FINAL TEST



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THE AE 592 CREW (NOTICE 3 OF THE
5 PEOPLE ASLEEP IN THE FINAL PICTURE)

