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The total Skylab mission plan covers eight months and
includes 140 days of occupation by three separate crews.
Use of Apollo spacecraft as ferry vehicles dictated a three-
man crew and the entire Skylab has therefore been
designed for this size of crew. The first mission lasted 28 days, ending on June 22. The second crew is due for launch on July 27 for a 56-day visit if all proves medically well with the first crew. The third and last crew launch, also for a 56-day visit, was recently re-scheduled for October 28. Each Skylab crew includes one scientist astronaut, desig-nated science pilot. The other two in each case are purely pilot astronauts, of whom one is the commander and the other is simply designated pilot for want of a more worthy

Aft bulkhead Rescue couches

title than just crewman. Of the first crew, only the com-mander, Capt Charles Conrad (USN), had previous space-flight experience, having flown in Gemini 5 and commanded Gemini 11 and Apollo 12. The Skylab mission, during which he celebrated his 42nd birthday, makes him the world's most experienced astronaut—until the next two crews complete their missions. His science pilot, Cdr Joseph P. Kerwin, is 40 and is a naval MD. The medical importance of the first mission necessitated the inclusion of a doctor in the crew. Cdr Paul J. Weitz (USN), aged 39, completed the crew and was also making his first flight.
The second mission will be commanded by Capt Alan L. Bean (USN), now 40, who was lunar module pilot for Conrad on Apollo 12. His science pilot is a civilian engineer, Owen K. Garriott (41). Mission pilot is Maj Jack P. Lousma (USMC), who is 38, and both he and Garriott are making their first space flight.
The third crew consists entirely of first-flight astronauts. Mission commander is 39-year-old Lt Col Gerald P. Carr (USMC). Civilian engineer Dr Edward G. Gibson (37) and Lt Col William R. Pogue (42), {he only Air Force member of the prime crews, complete the final team.
The specialised nature of operational and scientific requirements for Skylab has prevented the crew members from being totally cross-trained in all areas as they were for Apollo. Every crewman is trained to perform normal operations of all systems but each man is a specialist in certain areas. The main responsibilities for experiment operation and systems maintenance are accordingly divided as follows. Commander: overall mission, Apollo spacecraft systems and flight planning. Science pilot: Apollo Telescope Mount and medical experiments. Pilot: Earth-resources experiments and Skylab Cluster systems. By launch time each crewman will have received about 2,150hr of Skylab-orientated training.
The day-by-day activities aboard Skylab have been planned under a tight schedule which allows for certain overall time allocations under the experiment programme. For example, although the power shortage and over-heat-ing problems played havoc with the early part of their schedule, the first crew was planned to have spent about

511 man-hours on experiments and another 661 man-hours in systems checking, maintenance and vital daily chores. Medical experiments were to have received the largest share, at 177 man-hours, while 166 man-hours had been allocated to ATM operation. Earth-resources operations were to have taken up to 88 man-hours, with the remaining 80 man-hours going on the remaining scientific, technologi-cal and operational experiments.
Although official schedule times are based on GMT because of the international tracking network, the average Skylab day lasts from 0600hr until 2200hr, Houston time. Each crewman is allotted about 30min daily for personal hygiene and 45min for systems "housekeeping." About 2

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2hr is set aside for eating and 30-45min is allowed for personal leisure. The exact allocations for most activities vary with each of the three missions.
A day off is granted about every seventh day, although this can be changed subject to special experiment oppor-tunities such as with Earth-resources survey or solar obser-vation. The exact daily experiment programme is, in fact, planned on a day-to-day basis. Mission control prepares times and objectives during each night and the astronauts find the day's instructions on the teleprinter when they wake up in the morning.
A total of six 3hr extra-vehicular excursions, or space walks, were originally scheduled for the entire programme, although an additional 3hr EVA has already been required to open the remaining OWS solar wing. The EVAs are to change films in the ATM and will be performed by two crewmen in each case, one assisting and remaining by the hatch. The first mission EVA was scheduled for the 26th day. Three EVAs are planned for the 4th, 28th and 55th days of the second mission and a further two will be per-formed at the start and end of the last mission.

A unique rescue facility has been devised for the Skylab programme in case a problem with the Apollo CSM ferry craft prevents its use for return to Earth. For serious prob-lems with the station itself it is assumed that the crew can escape in the CSM. No provision has been made for simul-taneous loss of both.
A special rescue kit has been provided for rapid (8hr) installation in the Apollo CSM which is under preparation for the next of the three visits. For an emergency during the final visit, a back-up Apollo and Saturn IB would be brought into service.
The rescue kit modifies a normal three-man CSM to carry five men, allowing for a minimum two-man crew. For this, storage lockers on the aft bulkhead are removed and replaced with two additional crew couches, and life support and communications links are changed to allow for the two extra passengers. Space would be available for carriage of a limited quantity of experiments and films back to Earth.
Response time for a rescue mission reduces steadily as the programme proceeds. For any early problems, for example immediately after first docking by the first crew, minimum preparation time would have been 48 days. This would.shorten until a late emergency would require only ten days' preparation. The OWS can support life for about 150 days. An orbiting crew would therefore continue to . perform normal Skylab mission activities until they were rescued.
Total costs, by the end of the Skylab programme, will have amounted to about $2,600 million (£1,080 million) of which about $2,000 million went on hardware development. Remaining costs include about $200 million for mission operations.
Plans exist for a second Skylab, as most of the hardware has already been^built for back-up purposes and could be brought up to flight status at relatively little cost. A second mission, using a similar experiment programme, based on back-up equipment, would cost a total of about $600 mil-lion (£250 million).\Nasa estimates that such a mission could be readied within 12-15 months of a go-ahead decision. Replacement of the experiments would probably increase this cost by a further $350 million. The expendi-ture is, however, receiving poor response from Congress and Nasa is therefore likely to have to content itself with the rewards from its Skylab of the moment. •