

but also the number of emissions of solar flares. These flares are vast clouds of protons and electrons exuded by the Sun which travel millions of miles through space. They can play havoc with communications on Earth, they affect the total number of electrically charged particles trapped in the Van Allen belt and they cause many other effects.

The most important aim of this research is not just the establishment of a better Sun monitoring system for the prediction of radio communications disturbances, but simply a better understanding of the underlying mechanism of interactions between the Sun and the Earth. After all, everything that lives on Earth depends on the Sun. So we have a vested interest in the Sun. And yet the detail mechanism by which the Earth receives energy from the Sun is not very well known. It was only a few years ago man began to realize that although the Sun doesn't seem to change in appearance at all, except as to the sunspots, actually the Sun is undergoing continuous change. For example, the energy conveyed to the Earth in the ultraviolet region varies greatly over a period of hours and days. Long-term weather conditions are affected quite a bit by the variations in ultraviolet energy transferred to the Earth.

Man's role in the Apollo telescope system will be first, that of pointing and carefully aligning the telescope. We will have a pointing accuracy in the ATM system that permits us to vector in precisely any given spot on the Sun and to study that area in the light of radiations not received at the bottom of the atmospheric shell. Next the scientist-astronaut, working the ascent stage of the lunar module from where the ATM is operated, can change camera settings, exposure sequences, and filters according to visual observations or previously obtained results. The astronaut-scientists will also provide maintenance, monitor the operation of the equipment, replace film cassettes, record their visual observations on tape, and send films and tapes back to Earth. Of course they could also select visual "targets of opportunity" on the Sun. Whenever there is something conspicuous developing on the Sun, they will aim their instruments on the interesting spot and capture the incident while the action is on.

We consider this solar astronomical telescope only the forerunner of another instrument for similar observations, not of the Sun, but of the stars. It would be used for the study of ultraviolet, X-ray, and gamma rays emissions from the stars. Out of these first generation projects may develop in due time something like a Mount Palomar Observatory in orbit, a tool of inestimable worth to our astronomers. Our fiscal year 1968 budget would provide some of the funding for development of the Apollo telescope mount.

This chart shows the sequence of events by which we would put our workshop and ATM into orbit. We would use a total of four Apollo Applications flights. Here are the days, counting from day zero here, marking the time intervals between flights. On the left margin is the altitude of the orbit. We would start out by sending up a manned Saturn I with a mapping and survey system. That is the high-resolution camera you saw mocked up in the hangar today. In orbit, the service and command module would detach, turn around, and make the transposition just like with the lunar module. After transposition, the