The ATM includes scientific instruments and supporting sub-systems mounted in a structural rack attached to the ascent stage of an Apollo Lunar Module. It can be operated in several possible modes to obtain the maximum amount of solar data within the limits of available astronaut time and the possible degrading effects of motion and contamination disturbances.

The ATM is controlled by the astronauts to orient telescopes to selected solar activity regions or specific stellar targets, using a television monitor to locate targets of scientific value. The ATM enables experiments to be conducted using the data gathering features of recoverable photographic film as well as of photometric techniques. Communications from scientists on the ground to the astronaut-observer will aid in the selection of targets and the data to be recorded. The ATM pointing control system can hold alignment with selected targets for long term photographic exposures.

The initial launch of the ATM is planned to conduct solar observations from low earth orbits, beginning as early as 1969, to obtain data during the next period of maximum solar activity (1968 through 1970).

Five basic experiments to obtain solar data during the period of maximum solar activity have been selected for development for the initial ATM launches (Figure 9). Supporting instruments are also being developed to make the scientific experiment instruments more effective (Figure 10). The combination of instruments involved in the overall ATM experiment platform will provide a wide spectral view of the phenomena that occur during the next solar activity cycle and should yield information of considerable value to our understanding of the basic processes of solar activity.

The forthcoming period of maximum solar activity is expected to range from 1968 through 1970. This period is probably the most interesting period of the eleven-year solar cycle, however, there is still much to be learned about the sun's behavior during the remaining portion of the cycle. Scientific returns from the ATM experiments package mission during the 1970 portion of solar maximum, and on into the period of degrading activity would be extremely beneficial to the scientific community.

ATM SCIENTIFIC EXPERIMENTS

EXPERIMENT NUMBERS	ORGANIZATION	PRINCIPAL INVESTIGATOR	INSTRUMENT	PURPOSE
S052	HAO	DR. G. NEWKIRK	CORONAGRAPH	MONITOR THE BRIGHTNESS, FORM AND POLARIZATION OF THE SOLAR CORONA IN WHITE LIGHT.
S053	NRL	MR. J. D. PURCELL	CORONAL SPECTROHELIOGRAPH	MAKE HIGH-SPATIAL RESOLUTION MONOCHROMETRIC SOLAR IMAGES IN THE 160-650 ANGSTROM RANGE
			CHROMOSPHERIC SPECTROGRAPH	RECORD SOLAR SPECTRA IN THE 800-3000 ANGSTROM RANGE WITH HIGH SPECTRAL RESOLUTION
S054	AS&E	DR. R. GIACCONI	SPECTROGRAPHIC X-RAY TELESCOPE	STUDY SOLAR FLARE EMISSIONS IN THE SOFT X-RAY WAVELENGTHS (2-60 ANGSTROMS)
S055	HCO	DR. L. GOLDBERG	SPECTROHELIOMETRIC UV TELESCOPE	MAKE HIGH SPATIAL RESOLUTION SOLAR IMAGES IN THE 300-1400 ANGSTROM RANGE
			SPECTROMETRIC UV TELESCOPE	STUDY SOLAR SPECTRAL EMISSIONS WITH HIGH SPATIAL RESOLUTION IN THE 1450-2250 ANGSTROM RANGE
			HYDROGEN-ALPHA SPECTROHELIOGRAPH	MAKE HYDROGEN-ALPHA SPECTRO-HELIOGRAMS OF THE ENTIRE SOLAR DISC
S056	GSFC	MR. J. E. MILLIGAN	HI-RESOLUTION X-RAY TELESCOPE	OBTAIN TIME-HISTORIES OF THE DYNAMICS OF THE SOLAR ATMOSPHERE IN X-RAYS IN THE 3-100 ANGSTROM RANGE

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FIGURE 9