

Apollo - Saturn V

History: By 1961 the Soviet Union had built up a considerable lead in the space race. It had launched the first artificial satellite in 1957 and the first manned space flight in April 1961. By 25 May 1961 the only American manned space flight had been a fifteen minute sub-orbital flight. Even so, on that day President Kennedy announced that the United States would try to land a man on the Moon safely by the end of the 1960s. There was then nothing capable of achieving that goal although development work had begun on large rocket engines, the large F-1 that had been in development since 1958 and the hydrogen-fuelled J-2 on which work had begun in 1960. The Saturn I, that would use these engines, was also in development but far from being ready to fly.

The Apollo project gave great impetus to planning a series of Saturn rockets as the project planners evolved the best method in achieving their goal. Three fundamental concepts were first considered; an earth orbit rendezvous, a lunar orbit rendezvous and a direct ascent. The third option would have been far too large to be workable and eventually the lunar orbit rendezvous option, with a small vehicle making the descent to and ascent from the lunar surface to another vehicle in lunar orbit, was chosen as the quickest and easiest way of achieving Kennedy's goal. The Apollo system of a two part lunar lander and a central command module with an attached service module was developed to undertake the mission and appropriate Saturn launch rockets were developed to undertake the various steps of the Apollo project.

From 1960 to 1962 the Marshall Space Flight Centre designed rockets to be used on various Apollo missions, from the C-1 that evolved into the Saturn I, a C-2 and C-3 and a other stages that could be used to send Apollo components into earth orbit where four or five launches would be needed to assemble an Apollo vehicle to go to the moon. On 10 January 1962 NASA announced that it would build a C-5, with a first stage of five F-1 engines, a second stage of five J-2 engines and a third stage with a single J-2 engine. Initially NASA planned to test these stages separately but, in the middle of 1962, decided to combine testing of all stages into one launch to shorten the developing and testing time-line. In 1963 the C-5 was renamed Saturn V.

Initial testing of the Apollo components were carried out using the smaller Saturn Ib that was only capable of lifting them into earth orbit. After intensive design and testing lasting several years the first Saturn V was launched on 9 November 1967 with the Apollo 4 unmanned spacecraft on board. All Saturn V missions were launched from Launch Complex 38 at the Kennedy Space Centre in Florida. There were 12 Saturn V launches: Apollo 4, an unmanned test



Apollo 8 on its way to the launch pad, 1968

launched on 9 November 1967; Apollo 6, a second test flight on 4 April 1968; Apollo 8, the first manned flight and lunar orbit that was launched on 21 December 1968; Apollo 9, an Earth orbit test of the Lunar Module launched on 3 March 1969; Apollo 10, a test of the Lunar Module in lunar orbit, launched on 18 May 1969; Apollo 11, the first manned lunar landing, launched on 16 July 1969 and Apollos 12 to 17, all manned lunar flights launched between 14 November 1969 and 6 December 1972 (although Apollo 13 did not make a landing due to an accident on the way to the moon}. The final Saturn V flight was the launch of a two stage version that put Skylab I into orbit on 14 May 1973. Three more Saturn Vs were constructed and all are on display at museums in the United States.

In the meantime the Russians developed the N-1, which was not quite as large as the Saturn V, for its attempt to send a manned mission to the moon. It's first stage comprised 30 smaller engines rather than the Saturn V's five large F-1 engines and this seems to have been the major weakness in its design. There were four test flights of the N-1 and none of them lasted longer than the first stage. After those test failures the project was abandoned. No other operational launch vehicle has surpassed the Saturn V in height, weight or payload.

Data: *Engine* First Stage: five F-1 engines of 34.02MN (7,648,000lbf). Second Stage: five J-2 engines of 5MN (1,000,000lbf). Third Stage: one J-2engine of 1MN (225,000lbf). *Height* 111m (364ft). *Diameter* 10m (33ft). *Weight* 3,038,500kg (6,699,000lb).

The kit: Airfix 1:144

There were probably thousands of Apollo-Saturn V kits around in the 1960s. Airfix and Revell both made 1:144 kits and Monogram made a 1:96 kit. Since then the Airfix kit at least had been reissued its several times, but more recently they are becoming harder to find. After some patience I managed to pick up this Airfix kit for not-quite a king's ransom on eBay but these days they seem to be going for well over \$100 when they do appear on that auction site. Having been one of those youngsters who was swept up in the excitement of the Apollo era I was keen to get one of these kits to help mark those memorable times. (I seem to recall sitting watching the first lunar landing on a rickety old tv set in the Melbourne SF Club in 1969 and have fond memories of sitting up in bed with Valma in 1972 watching the moon buggy throwing up dust during the final Apollo mission on a tv set strategically located at the end of the bed.)

There's not much to say about this kit except that it is big. There are plenty of large and reasonable mounded lumps of plastic in the box and they go together with almost no drama. If some care is taken there is almost no need for filler.

The major apparent inaccuracy with the kit is that the command and service modules at the top seem too narrow and the escape tower looks quite clumsy. I overcame this by ordering in a replacement from *Real Space Models* which was a vast improvement over the Airfix original, although the increased diamante means the resin casting extends down to the top of stage 3. The escape tower is white metal with thick etched brass which still looks thicker than the real thing but is better than the Airfix original.

To enhance the look of the final model I also obtained a *New Ware* decal sheet, it is probably a vast improvement on the Airfix decal sheet but I found the kit I had bought lacked one so I don't know for sure. Painting is relatively simple - if you call vast areas of pure white simple - and I did the black panelling using black decal sheet to do the outlines and then painting in the rest by hand. The bare metal panelling of the service module caused me some troubles, but that was my own fault. The end result is a bit, impressive looking model of a unique shape.

