



## Lewis Hi-Energy Fuel Combos to be Used in Saturn Upper Stages

The flight configuration of the giant three-stage Saturn C-1 rocket is seen in the Fabrication and Assembly Engineering Division at the George C. Marshall Space Flight Center. Dwarfed by the 180-foot C-1 are a Juno II rocket (left rear) and a Mercury-Redstone rocket (front foreground).

The C-1 (first version of the Saturn rocket) is composed of an S-1 first stage or booster (rear), powered by eight Rocketdyne H-1 engines having a thrust of 1.5 million pounds, followed by a dummy S-IV second stage and a dummy S-V third stage.

The "live" S-IV for later flights, under development by Douglas Aircraft Co., will be powered by four Pratt and Whitney LR-119 engines having 17.5 thousand pounds thrust each. The live S-V, under development by Convair Division of General Dynamics Corp., will use two LR-119 engines. With all three stages live, the C-1 will be capable of placing 19,000 pounds into 300-mile earth orbit, sending 5,000 pounds to escape velocity, or lofting 2,500 pounds to Mars or Venus. The second version of Saturn, C-2, would double these capabilities.

The first flight, scheduled late this year, will employ a live S-1 with dummy upper stages.