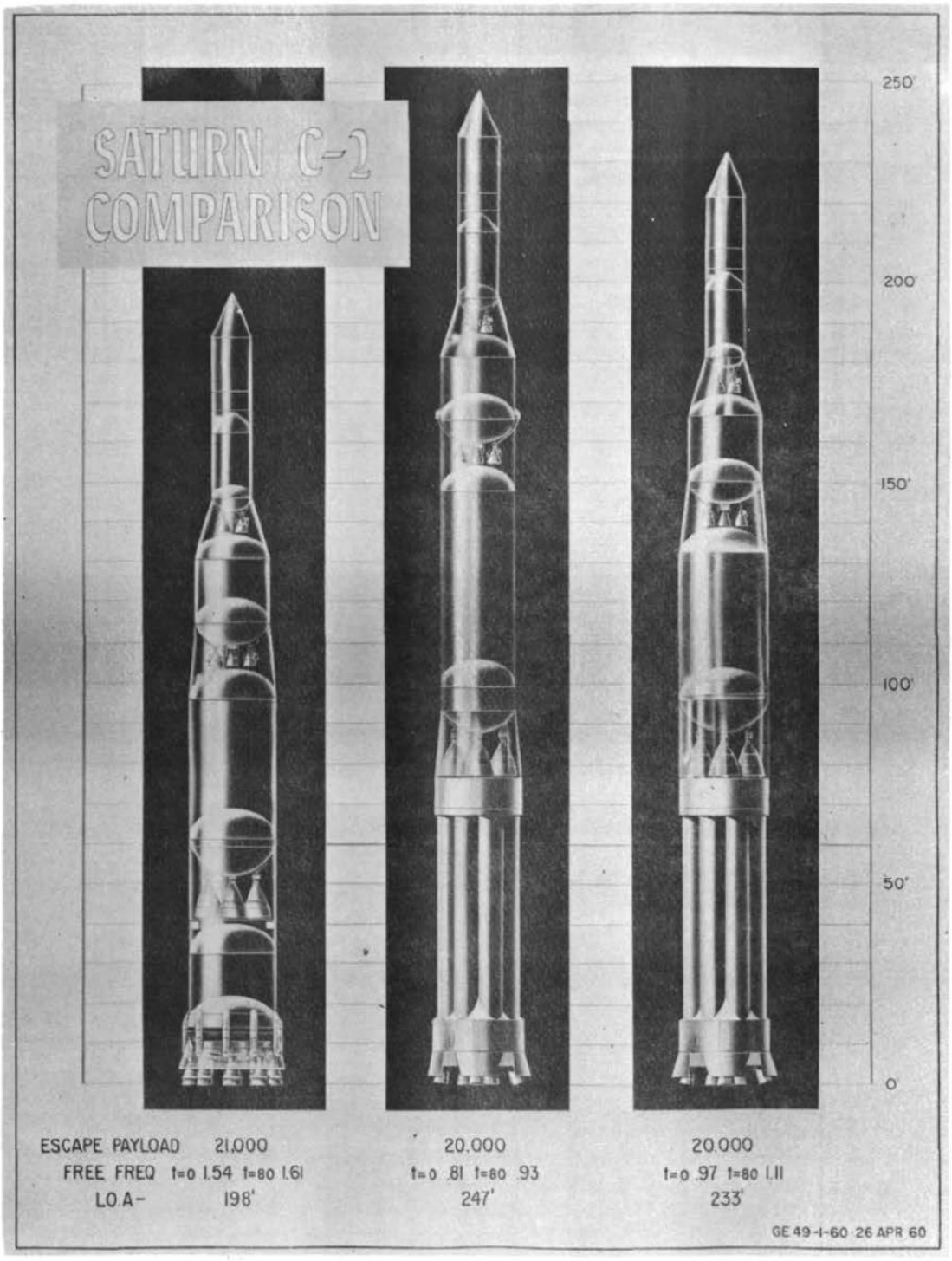


Proposed production C-2 on left, Interim Center with narrow S-II and Optimized Interim Right with 260" S-II (yes S-II not S-III! I was shocked to see this!)

TABLE III [redacted]

SATURN C-2 WEIGHT SUMMARY

4-STAGE ESCAPE MISSION

	W_B EXPECTED PROPELLANT CONSUMPTION	W_S STAGE DRY WEIGHT	W_n STAGE BURN-OUT WEIGHT	W_0 TAKE-OFF WEIGHT
STAGE I (CLUSTERED)	600,000 650,000 (capacity)	88,500	109,500	1,200,000
STAGE I (SINGLE TANK)	646,500 650,000 (capacity)	49,000	63,000	
STAGE II	320,000 330,000 (capacity)	26,620	31,610	490,500
STAGE III	71,500 100,000 (capacity)	8,430*	14,510*	137,870**
STAGE IV	29,000	5,000*	6,150*	51,860

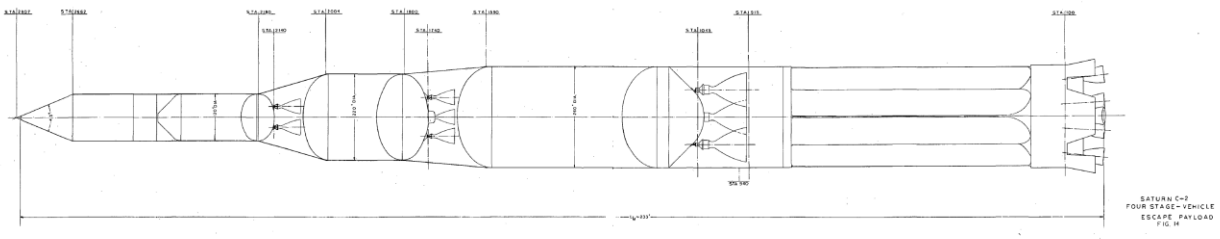
* Jettisonable insulation of 1,660 lb. in Stage II, 590 lb in Stage III, and 300 lb in Stage IV included.

** Weight of 130 lb for a propulsion device used to separate Stage III from Stage II.

GE 49-15-60 26 APR 60

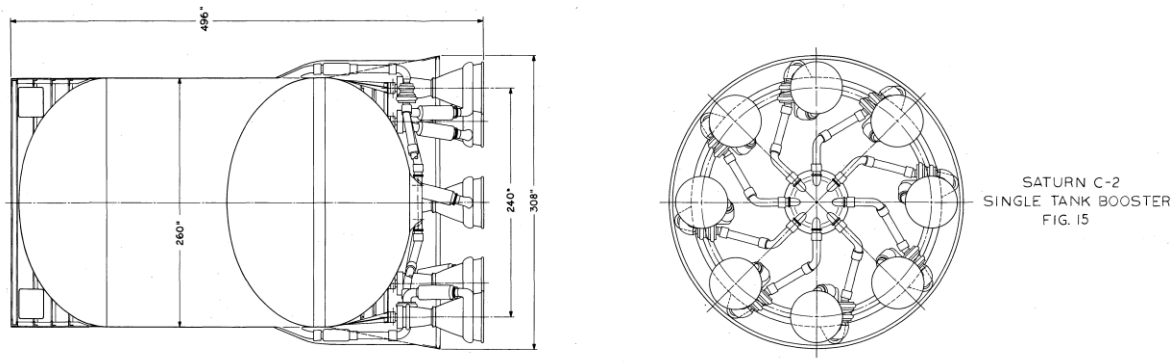
[redacted]

Proposed data for the Saturn C-2 and C-3 Stages (note the S-I cluster stage is 65" shorter than C-1's to reduce fuel capacity to 650,000lbs and maintain efficiency!)

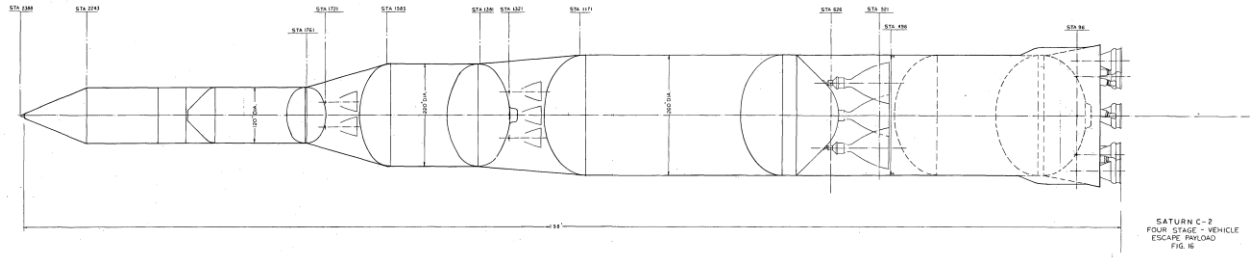


SATURN C-2
FOUR STAGE-VEHICLE
ESCAPE PAYLOAD
FIG. H

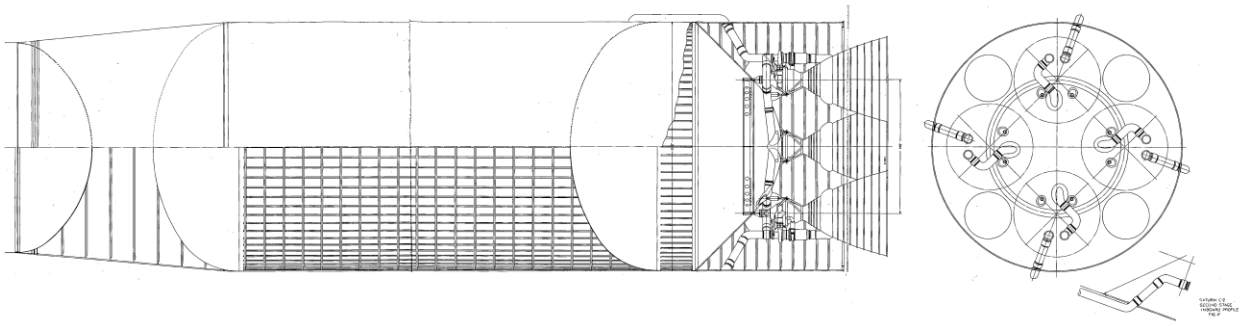
Saturn C-2 with Cluster First stage



Saturn C-2 Monohull First stage with H-1 engines

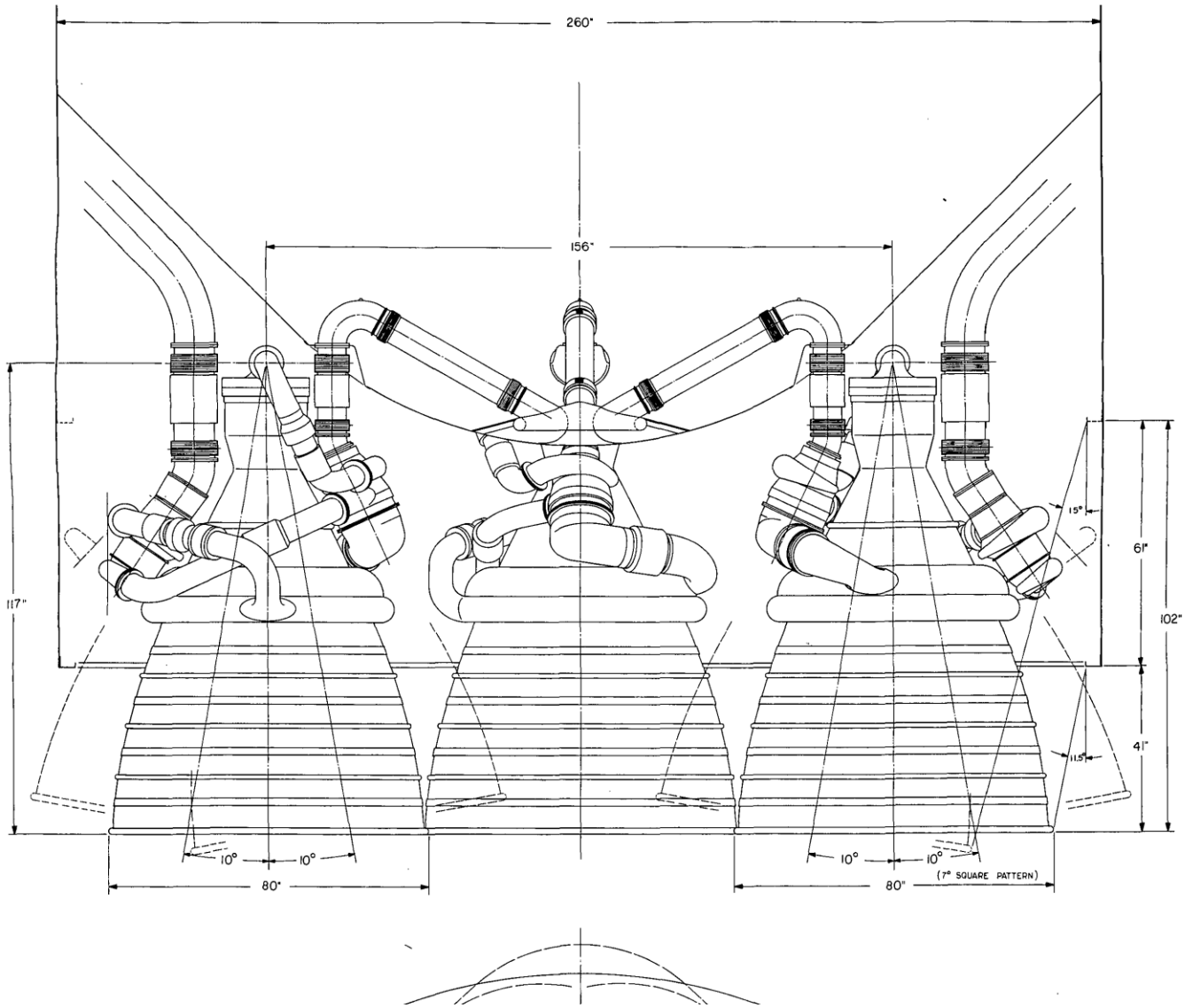


All up Saturn C-2 with Monohull First stage

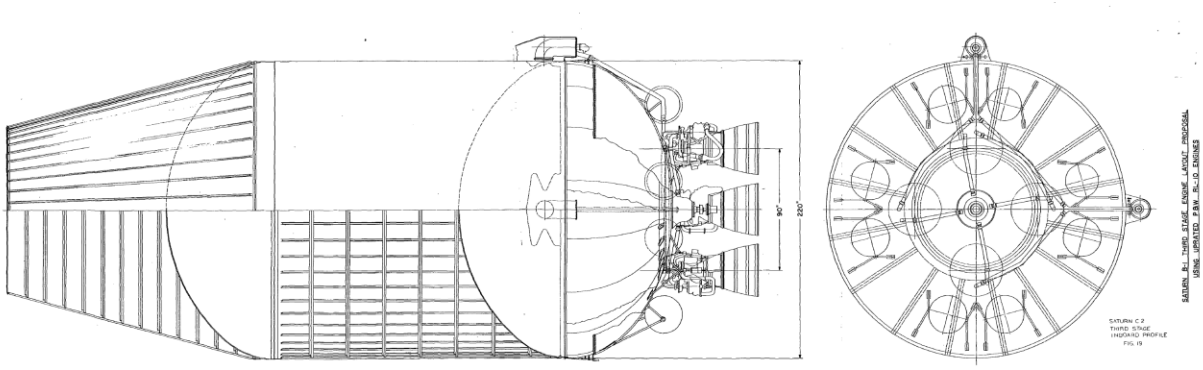


29

Saturn C-2 S-II stage including S-II to S-IV interstage area.



Preliminary J-2 Drawings from ABMA (not Rocketdyne drawings) Shows how the turbopump concept for these engines existed at the start of the design process.

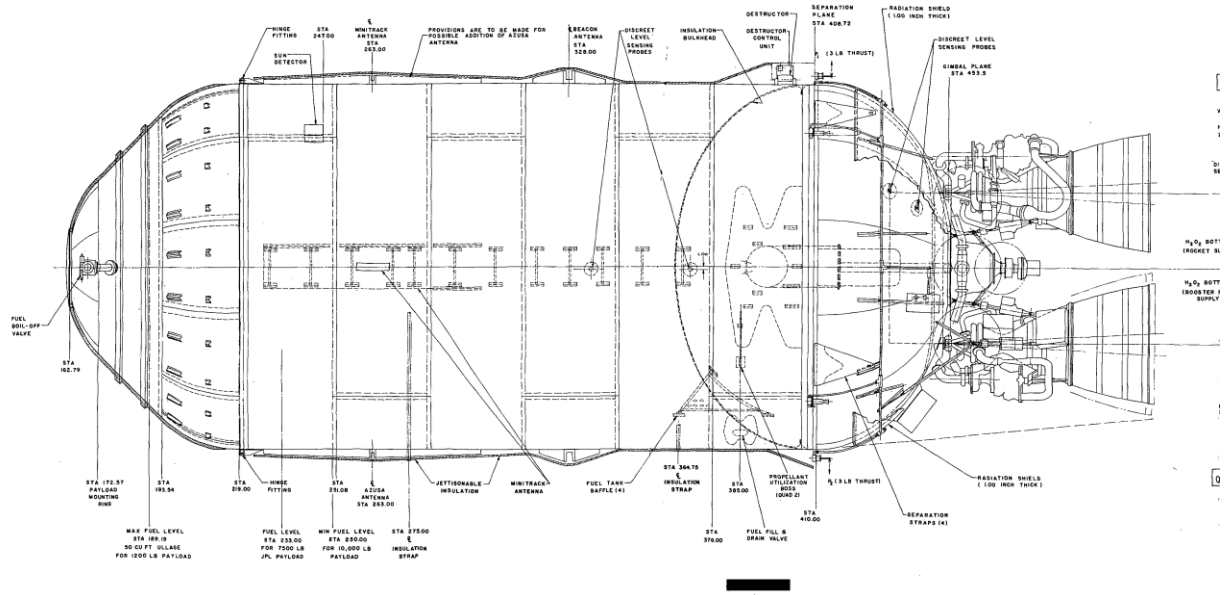


C-2 S-IV stage with XLR-119s (never built) 220" Diameter. Note HTP Hydrogen Peroxide tanks, 2 Per engine Fuel use was 100,000lbs Hydrolox. HTP tanks are for RCS system (so 334lbs of Monopropellant?)

The S-IV stages as depicted above has 600lbs of JETTESONALBE Insulation. Jettisoned at Stage ignition (same with the S-V Centaur above it. The insulation was caried through the coast. This differs significantly from the Centaur D, D.1 and D.1A of Atlas fame.

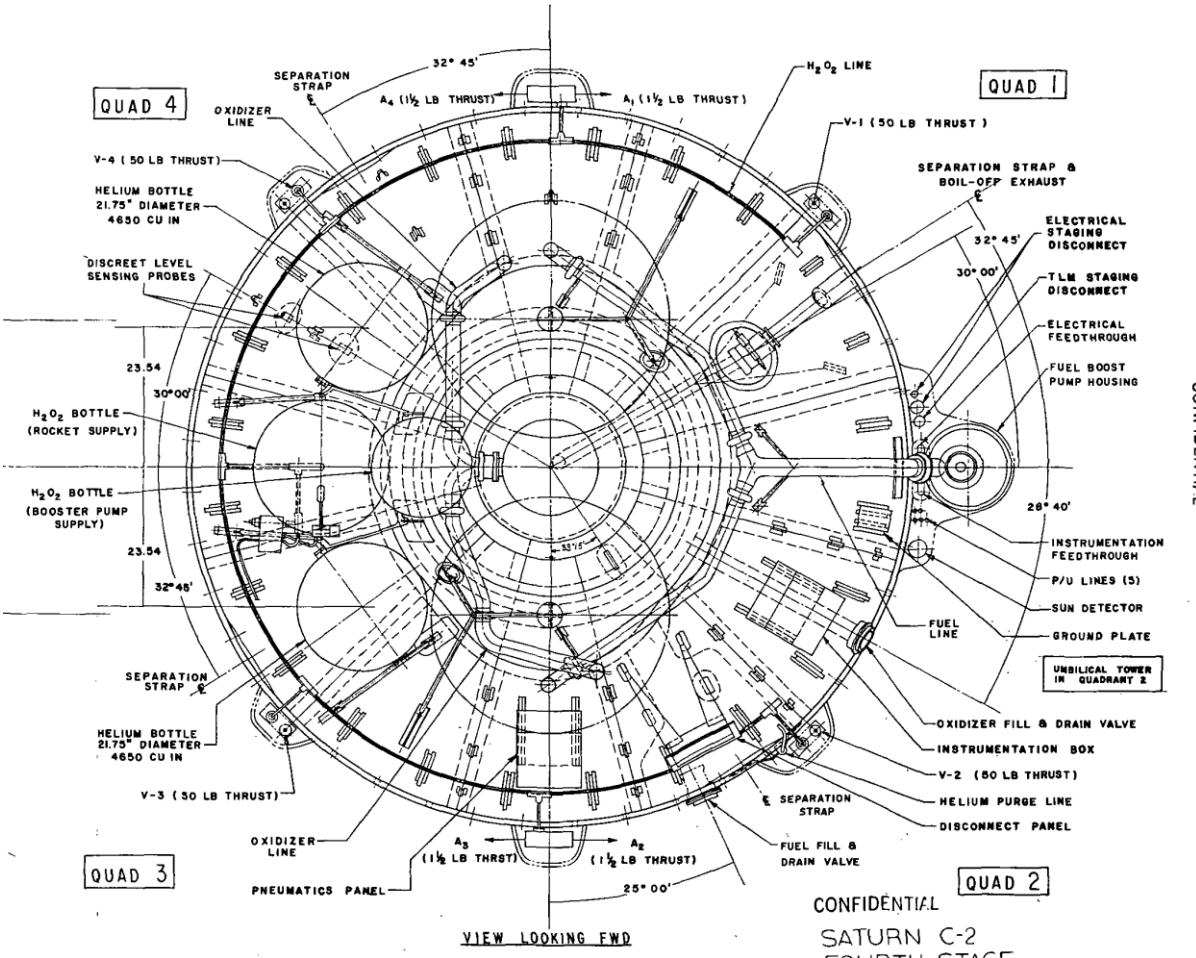
b. Propulsion System - The third, or S-IV stage, will use four Pratt and Whitney engines which will be identical to the engines used in the S-V or CENTAUR stage. The target thrust level for this standard engine will be 20,000 lb* with a minimum guaranteed specific impulse of 420 sec and a nominal mixture ratio of 5 to 1. This engine, designated as RL 10B-3, will use a standard expansion ratio of 40 to 1 as in the S-V or CENTAUR, and also will use a regenerative cycle and cool-down sequence which will be discussed later.

XLR-119 designated RL10B-3... Looks like Pratt & Whitney was using RL10x-3 for their first generation engine designation...



S-V Centaur, a new Centaur. The Centaur C, latter re-designated Centaur E, was powered by the XLR-119 or as we now know, the RL10B-3.

The Tank itself, while the same size and shape as the Centaur D from Atlas, has an increased wall thickness and is a monocoque tank rather than a Balloon tank, IE it does not need to be pressurized, although pressurization would make it safer to handle still.

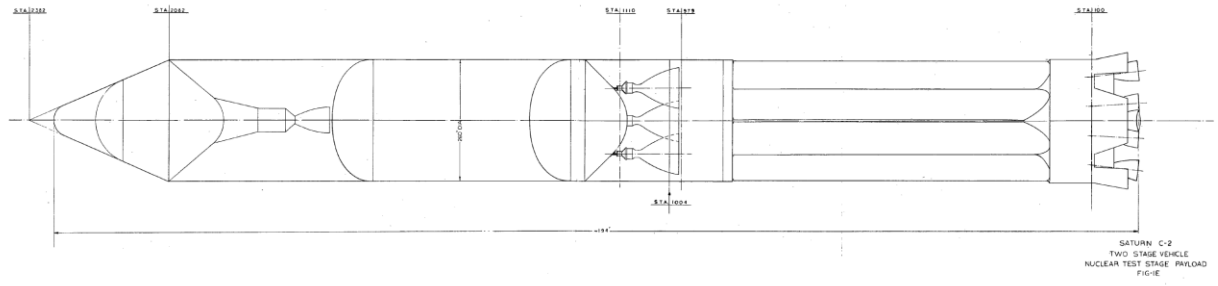


CONFIDENTIAL

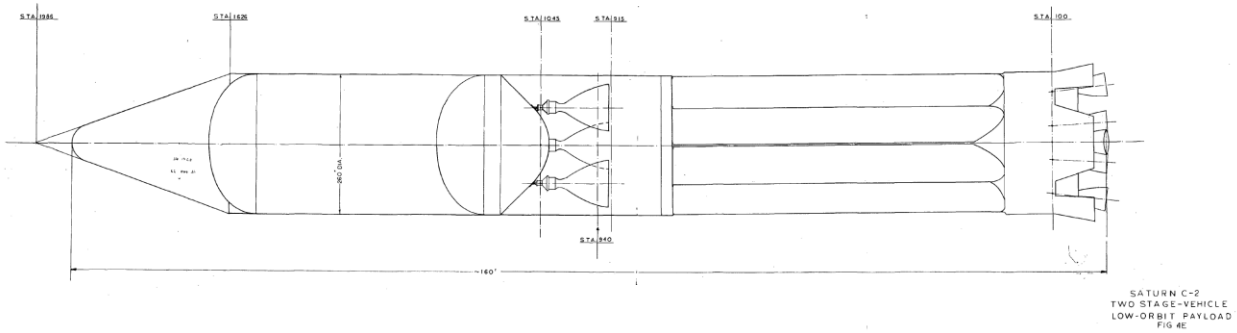
CONFIDENTIAL

SATURN C-2
FOURTH STAGE
INBOARD PROFILE
FIG. 20

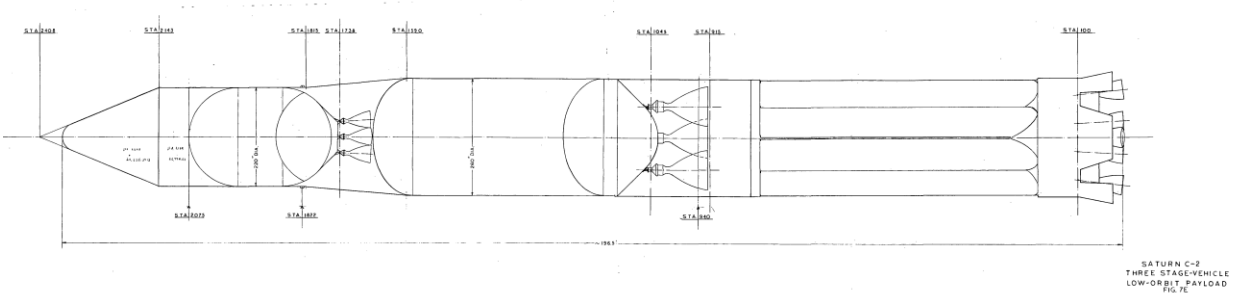
End on view of the Centaur C/E showing HTP tanks Helium Tanks etc.



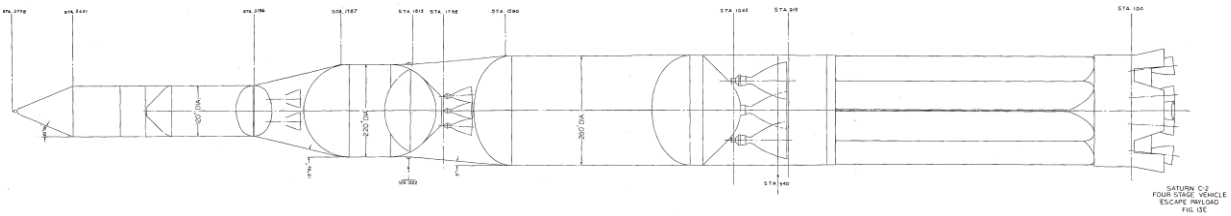
Simple does it work test stage on Saturn C-2.



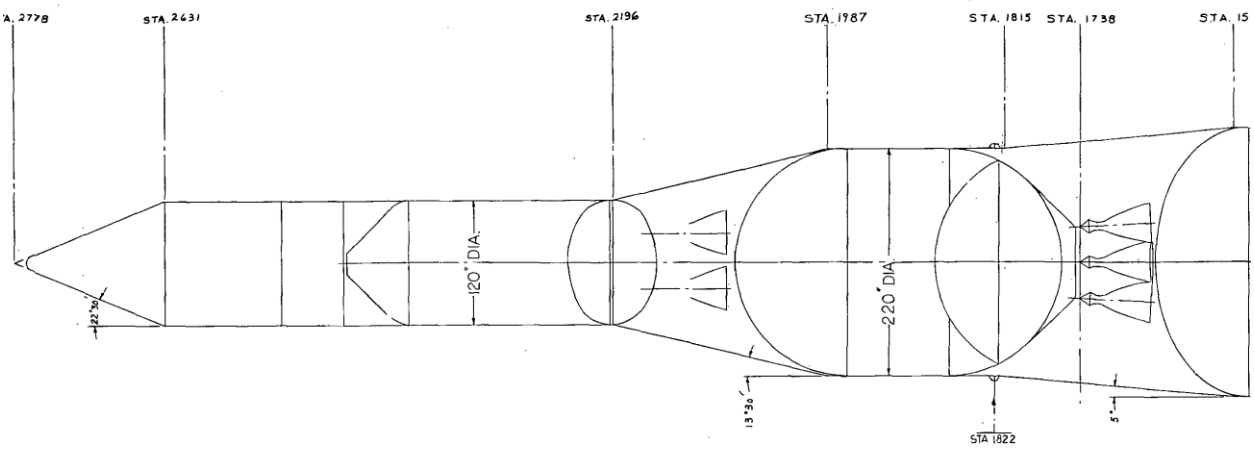
Two stage Saturn C-2.



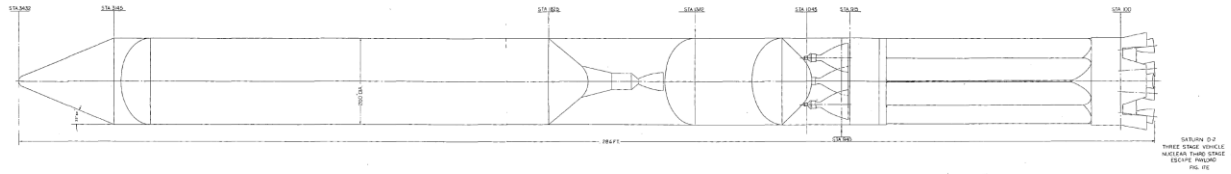
3 stage with extended PLF C-2



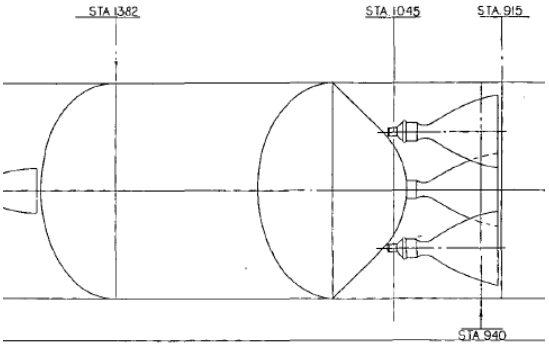
4 Stage with Centaur C/E (aka S-V)



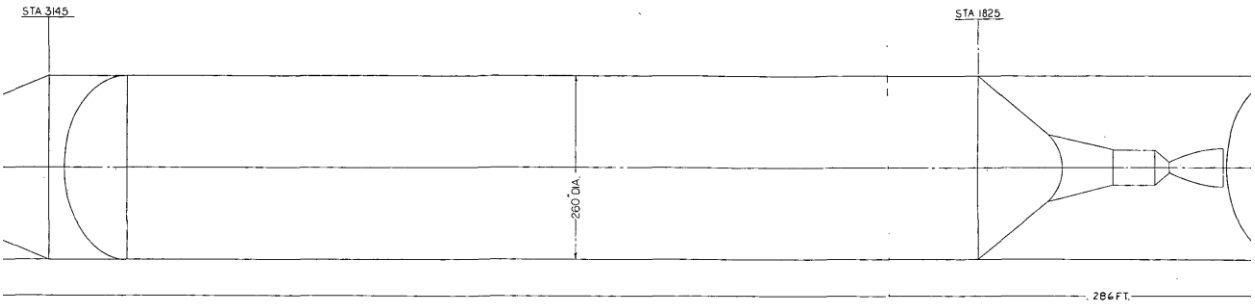
Close up of the S-IV and S-V stages for dimension purposes as well as PLF sizing for the S-V.



Nuclear D-2 A Saturn C-2 with a new Nuclear 3rd stage and a shortened S-II stage.



The D-2's S-II stage showing lengths readable



And the D-2's NERVA/Timberwind whatever stage

Source: NASA NTRS server 19630045066 Saturn C-2 Phase I Preliminary Design Report