

Date: December 15, 1959  
 Revised: \_\_\_\_\_

#### 4.0 GENERAL TEST CONFIGURATION

4.1 Capsule.- The general configuration of the capsule, escape tower, and escape rocket is presented in figure 4-1. The capsule structure is shown in figure 4-2. The capsule is a conical frustrum having a blunt forebody and an afterbody which tapers to a cylindrical section. The cylindrical section supports a truncated antenna cone (canister), escape tower, escape rocket, and pylon jettison rocket. The basic capsule is a 20° cone having a maximum diameter (at the heat sink) of 74.5 inches and a minimum diameter of 32 inches where it joins the cylindrical section. The capsule is 90.33 inches long from the end of the heat sink to the end of the cylindrical section (parachute housing). The antenna section attaches to the cylindrical section and is 24 inches long tapering to a diameter of 20 inches at its small end. The main capsule section contains the pressurized cabin, the recovery compartment or parachute housing, the heat sink, and all of the major capsule systems. The antenna fairing houses the main bi-conical horn antenna system, the drogue parachute, and the horizon scanner system. The antenna fairing is attached to the main capsule by a central mortar. The escape system consists of a tubular support structure, the main escape rocket, the pylon jettison rocket, and aerodynamic spike, ballast, a heat shield for the antenna housing, and an attaching clamp ring. The length of the overall configuration from the end of the heat sink to the tip of the aerodynamic spike is 303.32 inches.

4.1.1 Capsule weight.- The weight of the capsule varies throughout the flight. Weights for the different phases of this flight are shown below. The weights listed are approximate. They are currently accurate to within 5 pounds for each phase of the flight. For the purposes of this documentation, no attempt will be made to keep abreast of the myriad minute changes in weight that will continue to occur until the capsule and its equipment are finalized. Any meaningful changes, of course, will be promptly reported.

	<u>Weight, lbs.</u>
Gross weight at launch	3,625
Effective launch weight	2,835
Weight after booster cutoff	3,625
Weight after tower separation	2,640
Weight at end of posigrade firing	2,520
Retrograde weight	2,515
Reentry weight	2,265
End of reentry weight	2,260
Main parachute design weight	2,220
Impact weight	2,150
Flotation weight	2,085

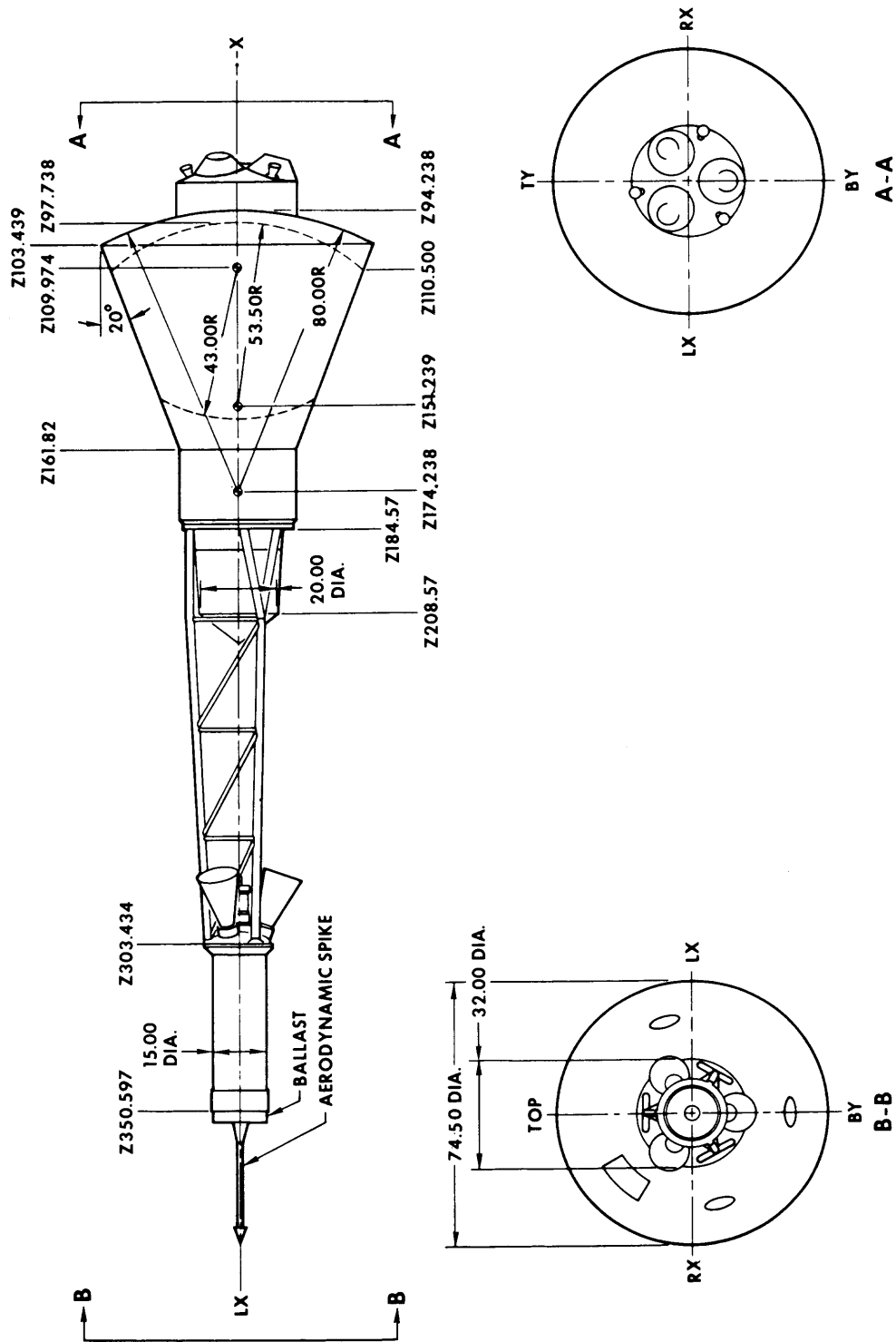


Figure 4-1.- General arrangement of capsule and escape system.

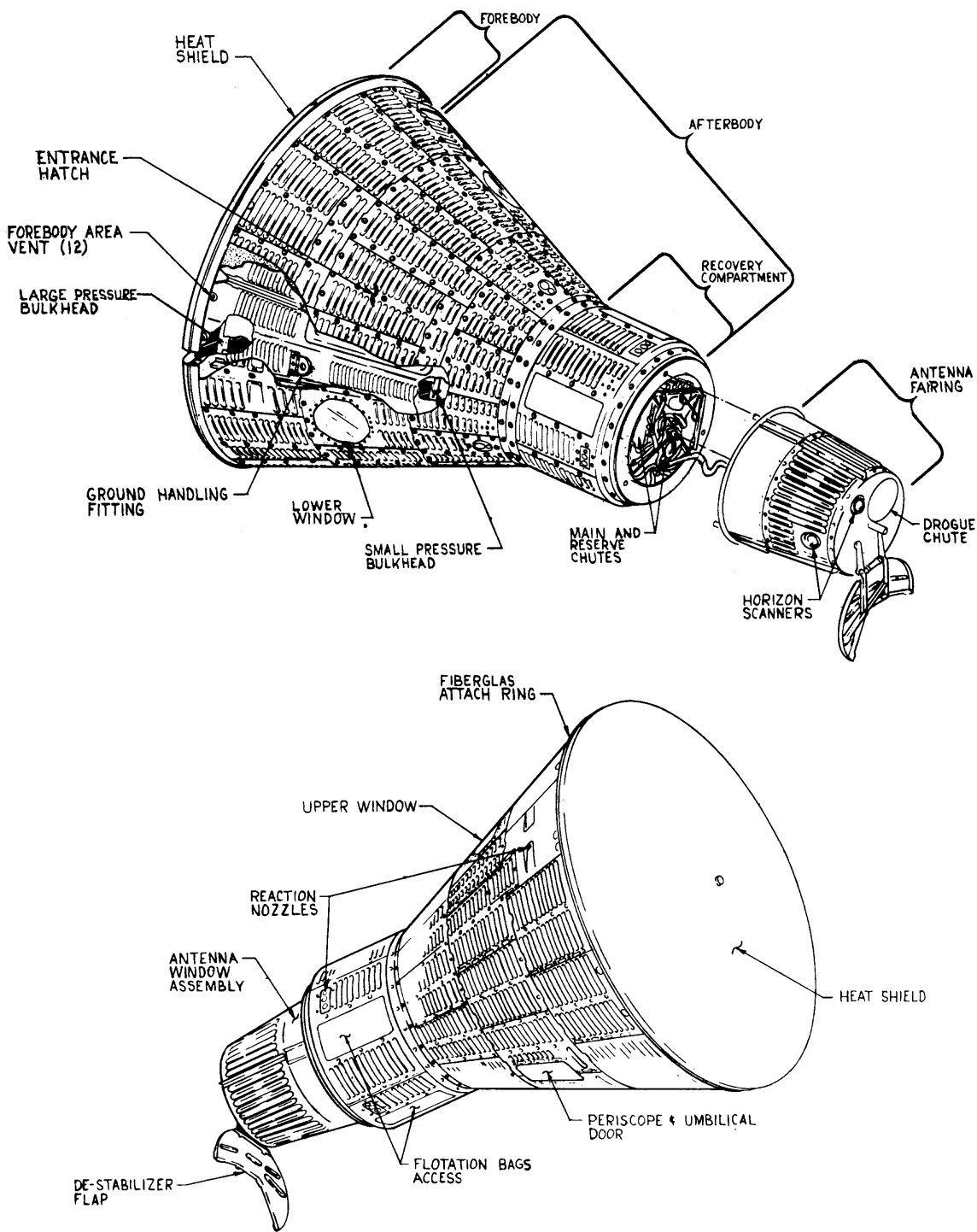


Figure 4-2.- Capsule-structure.

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- 4.2 Adapter.- The capsule is mated to the Redstone booster by means of a 7-inch long conical shell adapter which is being built at ABMA (see figure 4-3). This adapter mates with the "aft unit" of the booster.
- 4.3 Booster.- A sketch of the Redstone booster, in combination with the adapter, capsule, and escape system is shown in figure 4-4. For the Mercury program the Redstone booster has been elongated by 96 inches in order to provide for a burning time of up to 150 seconds. The elongated booster is approximately 58 feet high, therefore with the capsule and escape system mounted on top, the complete configuration is over eighty feet long. The Redstone booster uses alcohol as its fuel and liquid oxygen as the oxidizer. It develops approximately 78,000 pounds of thrust, and has a total take-off weight of over 65,000 pounds. Booster diameter is 70 inches. The LEV-3 autopilot type control system is used. Four movable carbon vanes located at the end of the tail section are utilized for aerodynamic control during powered flight.

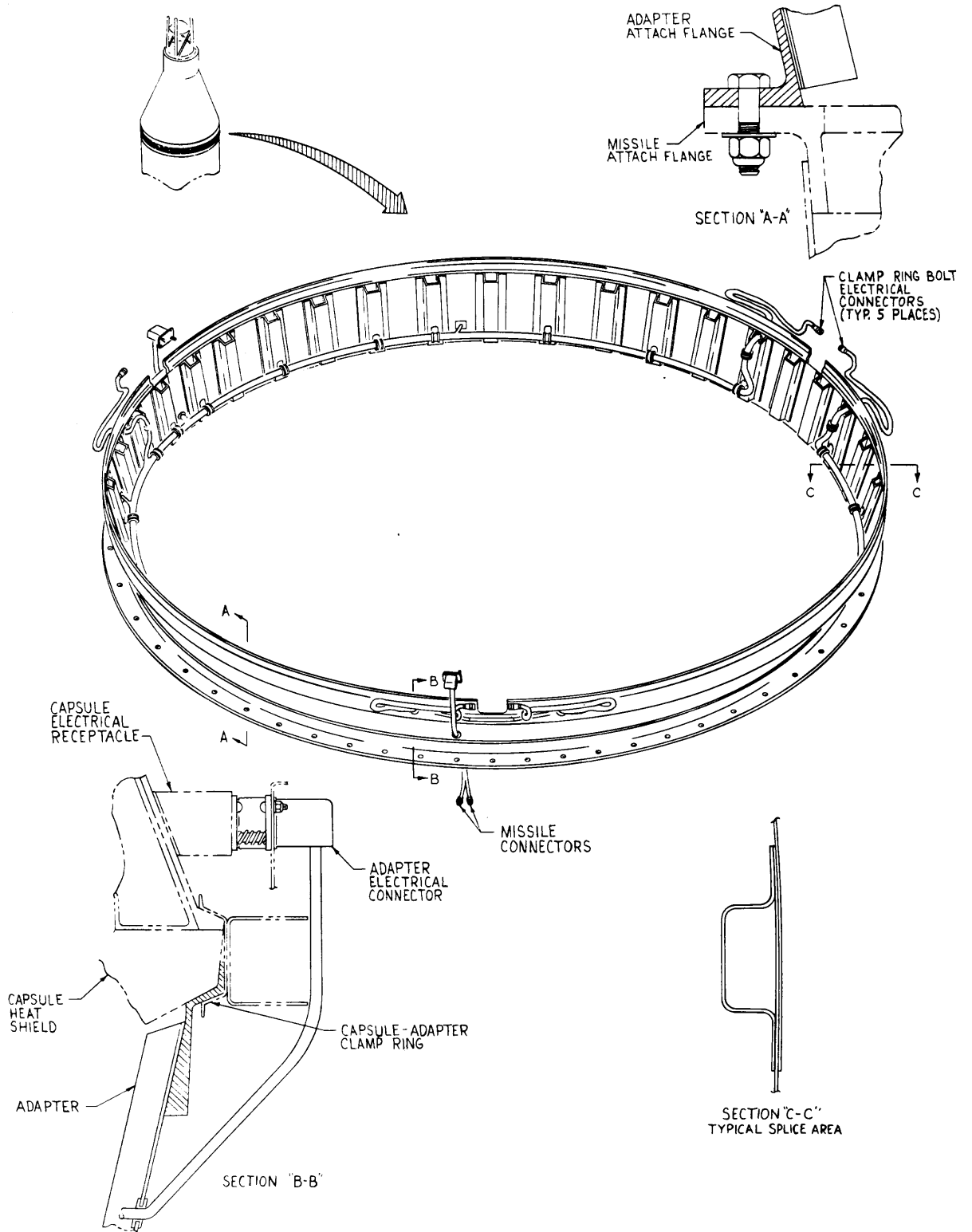
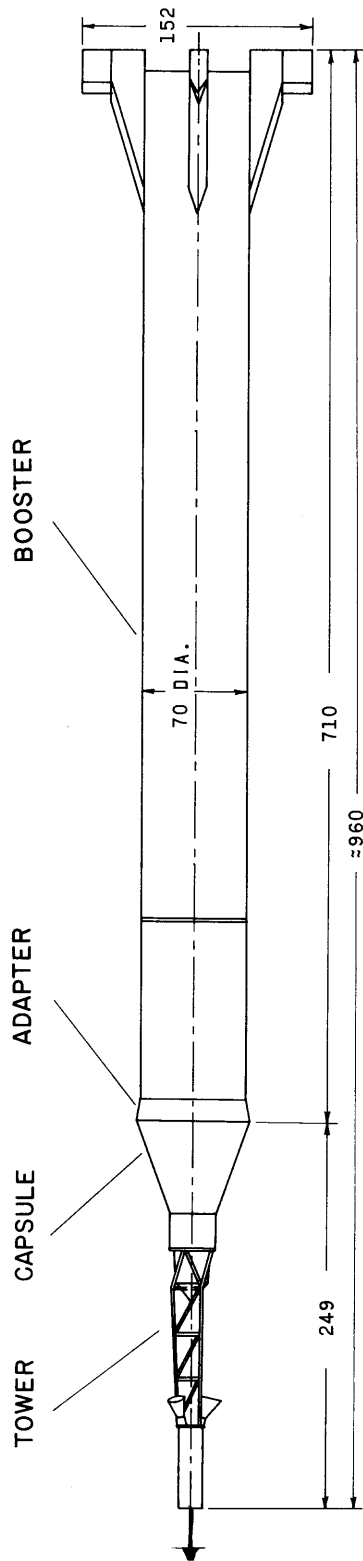


Figure 4-3.- Capsule-booster adapter.



DIMENSIONS ARE IN INCHES

Figure 4-4.- Mercury-Redstone capsule-booster configuration.