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SURVEY OF FRC RECOVERY RESEARCH

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Recovery research at FRC has, as indicated in the first chart, been concentrated in the areas of conventional aircraft, drogue parachutes and paragliders. Planned work includes flight tests of lifting-body recovery vehicles and a lunar-landing simulator.

The FRC research on landing of conventional aircraft will not be discussed here since it has been adequately reported in references 1 through 7. This work is continuing.

The FRC has completed development and proof tests of two drogue chute systems, one for the Mercury capsule and the second for the B-58 escape capsule. Both programs utilized the F-104A airplane which is capable of launching up to 1500 pounds weight at Mach numbers up to 2 at altitudes between 30,000 and 50,000 feet. It can zoom, as shown in the second figure, to release the store at altitudes as high as 85,000 feet, but at lower speeds. The test conditions for the Mercury drogue are shown on the third chart and the test results are reported in reference 8. The B-58 escape capsule tests involved releases of a 630 pound capsule at a Mach number of 2.02 and altitudes of 45,000 and 31,000 feet. The maximum q for these tests was 1690 pounds per square foot. Tests were also performed at altitudes as low as 18,000 feet and a Mach number of 1.25. At present, no further drogue tests are planned.

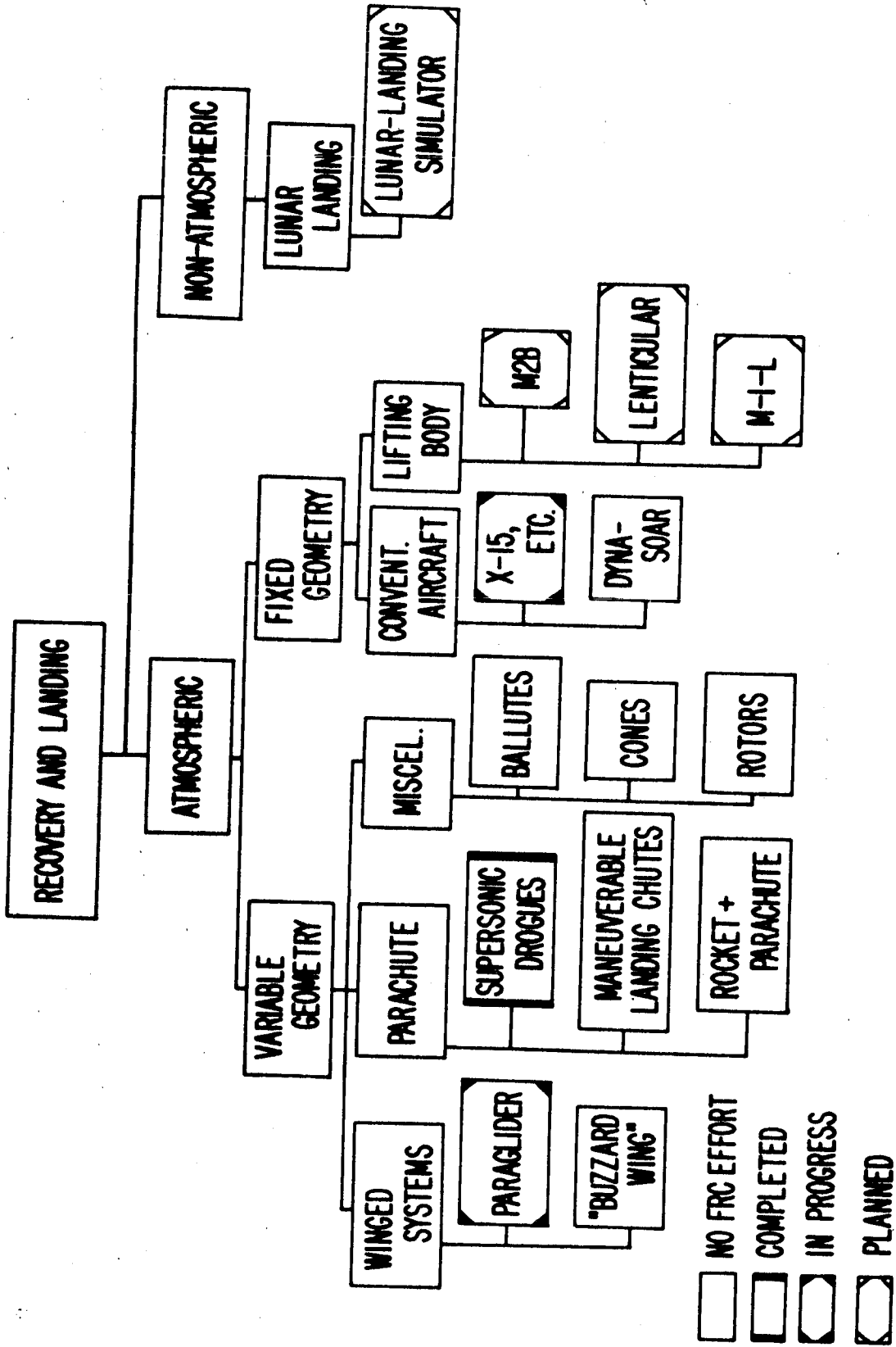
Although not the subject of the meeting, a brief description might be given of the planned lifting-body program. The lifting-body program at FRC will be initiated by the construction of several lightweight, full-scale man-carrying glider vehicles. These vehicles will have configurations which high-speed tunnel tests have indicated to be attractive for reentry. Configurations such as the M2B, lenticular, and M-1-L are being considered. The low speed and landing characteristics of these lightweight (W/S 4-7 lb/sq ft) vehicles will be investigated in free flight following release from airplane tow. Later phases include the construction and tests of full-scale wing-loading vehicles of the more promising configurations. Tests at higher speeds with these heavyweight configurations may be performed.

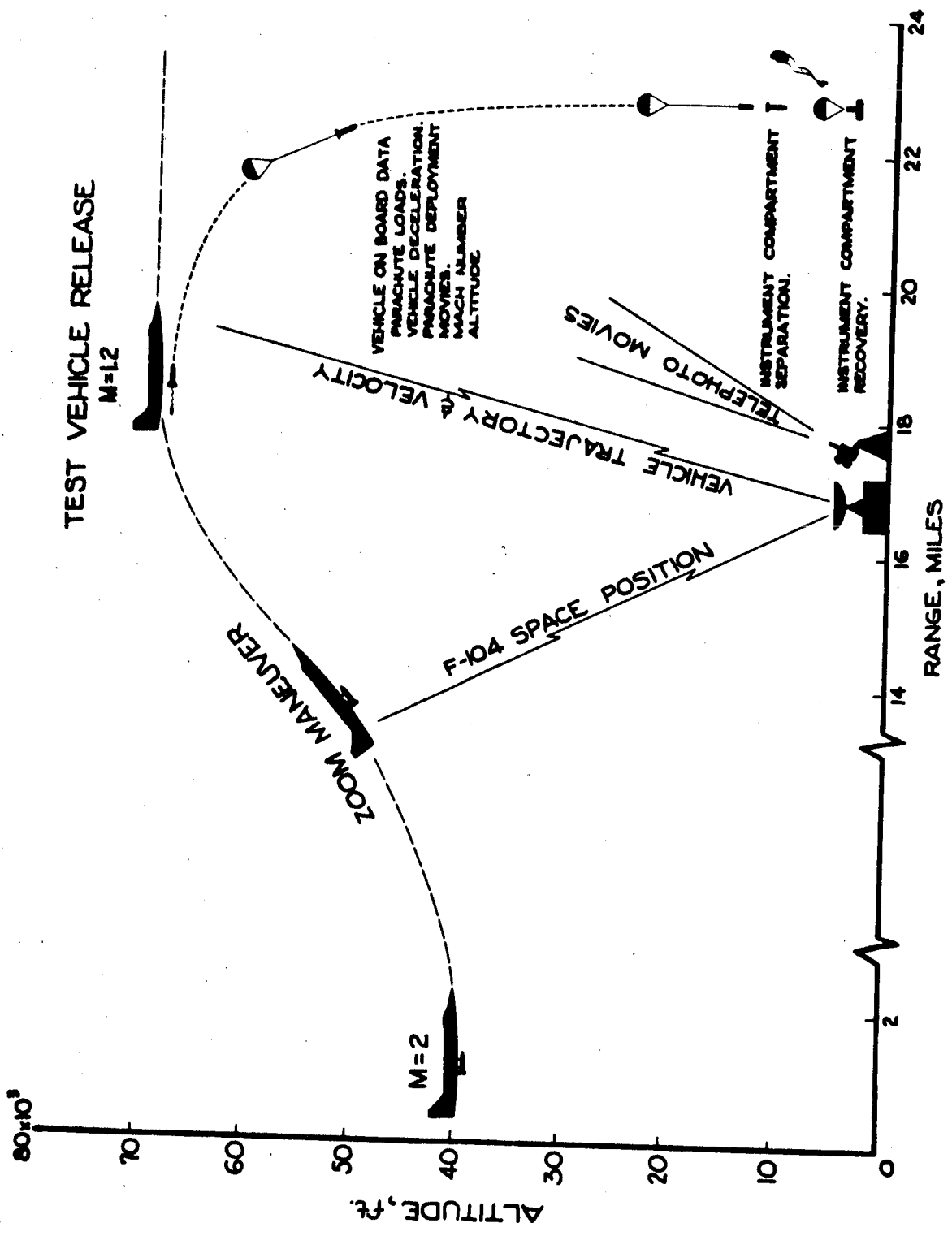
A word might be said here regarding the capabilities of launch vehicles at the FRC. The capabilities of the F-104A have been mentioned. This airplane is also capable of launching rockets of up to 1500 pounds weight at up to 90° climb angle, see reference 9. Two B-52 aircraft are also available, which are used for launching X-15 aircraft. These B-52 aircraft are capable of launching stores of up to 35,000 pounds weight and approximately 10 feet in diameter. The launch-altitude capability extends to about 50,000 feet; the speed capability is about 0.8 Mach number. In addition to the F-104A and B-52 capability, an A3J has been requested for FRC for another program. This airplane could launch stores of up to 5,000 pounds at the same conditions as the F-104A.

Mr. Horton will discuss the current FRC paraglider program.

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80x10³

70

60

50

M=2

30

20

10

0

2

14

16

18

20

22

24

6 FT. DROGUE PARACHUTE TESTS

