

ACKNOWLEDGMENTS

**ECONOMIC ANALYSIS OF THE  
SPACE SHUTTLE SYSTEM**

**EXECUTIVE SUMMARY**

Study directed by

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and  
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for the

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Dr. Klaus P. Heiss, Director of Advanced Technology Economics and Dr. Oskar Morgenstern, Chairman of the Board of MATHEMATICA, Inc. have been fully responsible for the overall conception, approach and implementation of the economic analysis of the Space Shuttle System.

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## 0.1 CONCLUSIONS

The major conclusions of the Economic Analysis of the Space Shuttle System are:

- o THE DEVELOPMENT OF A SPACE SHUTTLE SYSTEM IS ECONOMICALLY FEASIBLE ASSUMING A LEVEL OF SPACE ACTIVITY EQUAL TO THE AVERAGE OF THE UNITED STATES UNMANNED PROGRAM OF THE LAST EIGHT YEARS.
- o A THRUST ASSISTED ORBITER SHUTTLE (TAOS) WITH EXTERNAL HYDROGEN/OXYGEN TANKS IS THE ECONOMICALLY PREFERRED CHOICE AMONG THE MANY SPACE SHUTTLE CONFIGURATIONS SO FAR INVESTIGATED. EARLY EXAMPLES OF SUCH CONCEPTS ARE RATO OF MCDONNELL DOUGLAS, TAHO OF GRUMMAN-BOEING, AND SIMILAR CONCEPTS STUDIED BY NORTH AMERICAN ROCKWELL AND LMSC - LOCKHEED; THESE CONCEPTS ARE NOW COMMONLY KNOWN AS ROCKET ASSISTED ORBITERS (RAO).
- o THE CHOICE OF THRUST ASSIST FOR THE ORBITER SHUTTLE IS STILL OPEN. THE MAIN ECONOMIC ALTERNATIVES ARE PRESSURE FED BOOSTERS AND SOLID ROCKET MOTORS, EITHER USING PARALLEL BURN. A THIRD ECONOMIC ALTERNATIVE TO THESE VERSIONS IS TO USE SERIES BURN BOOSTERS.

These conclusions are based on the following results of the economic analysis: