

## [ATTACHMENT C]

## LIST OF CURRENT AND FUTURE SONIC BOOM EFFORT

## ACTIVE GOVERNMENT IN-HOUSE PROJECTS

## A. Sonic Boom Generation:

1. Continuing refinement of boom prediction analytical procedures. NASA/Langley.
2. B-70 analytical, wind tunnel, and flight correlation. NASA/Langley.
  - a. Refinement of B-70 configuration analysis.
  - b. Wind tunnel boom near-field tests.
  - c. Wind tunnel calibration of flight probes.
  - d. Correlation of B-70 flight near-field surveys.
3. Extension and modification of Whitham theory to hypersonic speeds ( $M=6$ ). NASA/Ames.
4. Study of boom signature characteristics at flight speeds only slightly supersonic. NASA/Langley.
5. Experimental/analytical study of the flow fields of a systematic series of bodies of revolution at  $M=5$ , NASA/Langley.
6. Application of near field analytical procedures to provide close-in flow characteristics. NASA/Ames.
7. Analysis and correlation of high-altitude X-15 sonic boom flights ( $M=3$  to  $5.3$ ). NASA/Ames/FRC.
8. Analytical determination of body shapes to minimize auditory response. NASA/Lewis.
9. Determination of SR-71 sonic boom generation characteristics and correlation with EAFB flight experiments. NASA/Langley.

## B. Wave Propagation and Reflection:

1. Analyses of EAFB B-70, B-58, F-104, and SR-71 flight programs to establish atmospheric propagation effects. NASA/Langley/ESSA.
2. Conduct and analyses of Phase I and II of SR-71 Sonic Boom Research Program. OST, FAA, USAF, NASA, ESSA.
3. Analysis of boom signature trace through a non-uniform atmosphere via characteristic system. NASA/Langley.
4. Experimental study in a ballistic range of shock propagation through an atmosphere non-uniform in temperature and velocity. NASA/Langley.
5. Investigation of atmospheric inversion waves in relation to observed long wave length periodicity in maximum overpressure (Phase I and II EAFB). ESSA.
6. Investigation of the effects of turbulent eddies in the planetary boundary layer relative to the short distance variation in boom intensity. ESSA.
7. Study of atmospheric effects on overpressures by comparison of computer program estimates for a quiescent atmosphere. ESSA.
8. Statistical study of the effects of the atmosphere on overpressure variability. ESSA.

## C. Sonic Boom Minimization:

1. Fundamental analysis of aerodynamic concepts for minimizing or eliminating the sonic boom and the application to complete configuration concepts. NASA/Langley/Ames.
2. Application of existing sonic boom and aircraft design technology to the development of a low boom domestic SST. NASA/Langley.

## GOVERNMENT SPONSORED OR CONTRACT RESEARCH

The area of government sponsored research is currently in a state of flux with most of the contracts in various stages of proposal, contract review, or negotiation. The most likely candidate for government support are included here to provide an indication of the scope of the proposed contractual effort. There is a question as to whether the proposed research listed herein should be included in the appropriate Industry or University listing rather than under Government cognizance.