ENTRY FLIGHT REGIMES: APOLLO AND ORBITER

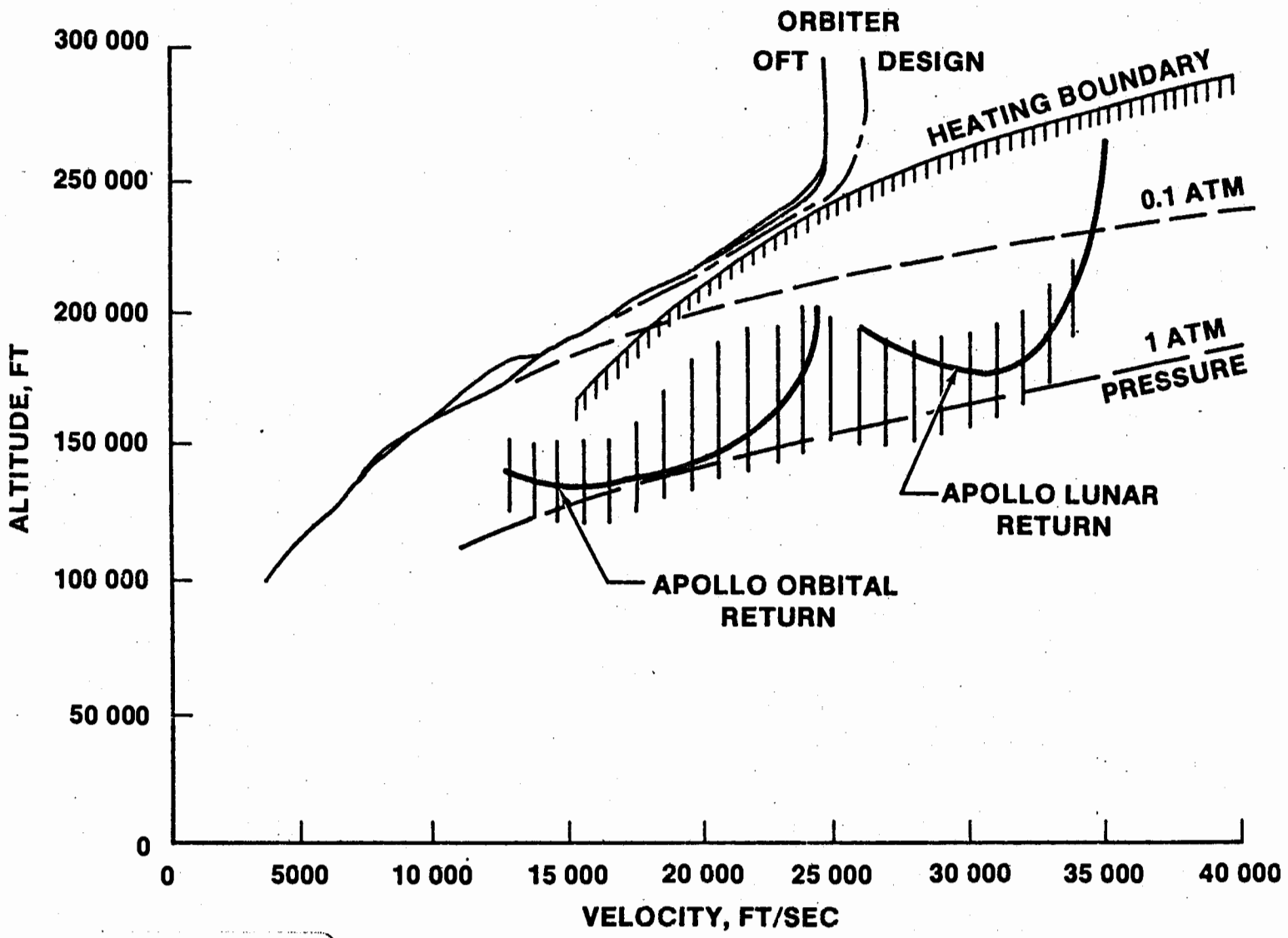
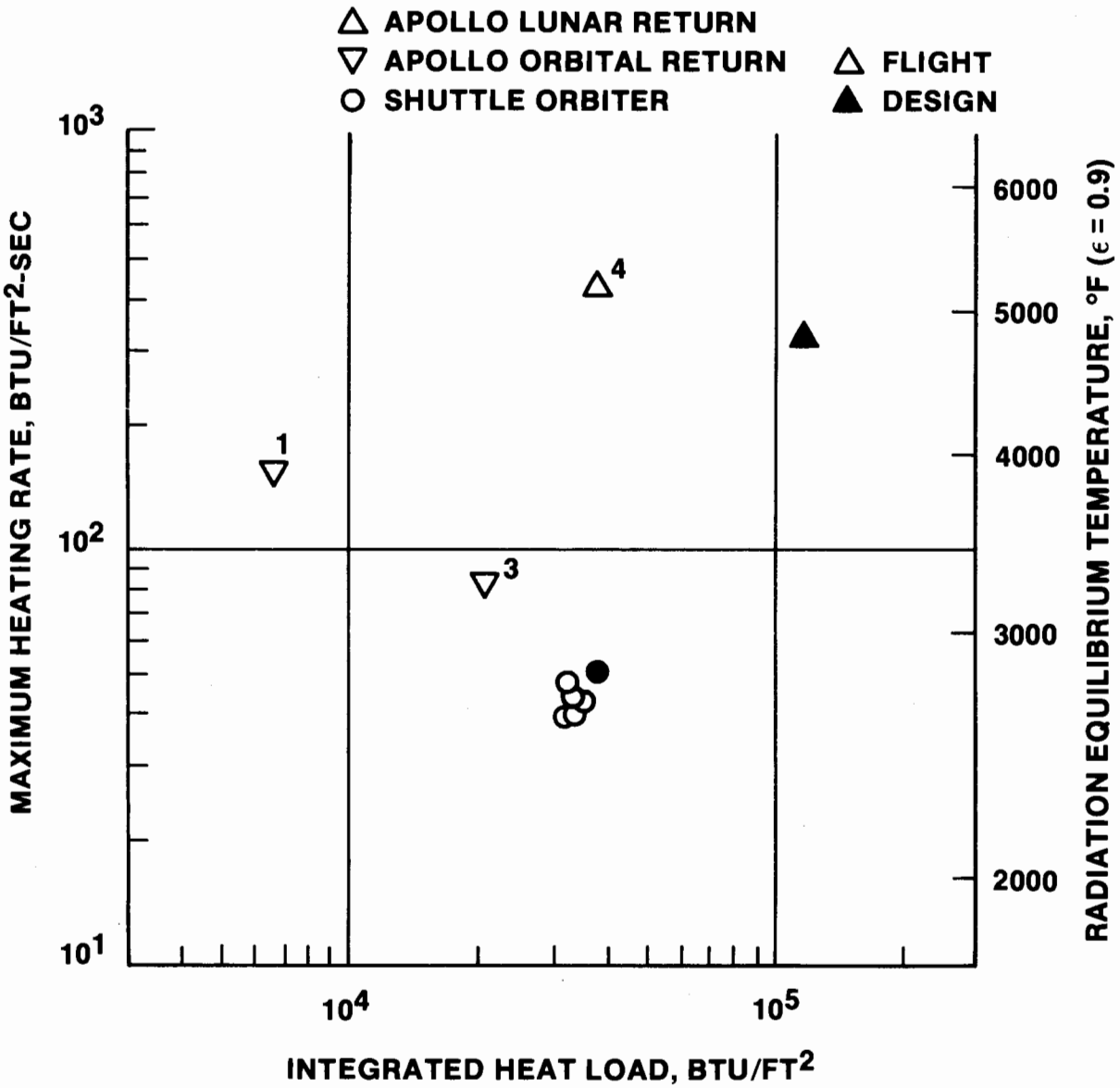


FIGURE 1

DESIGN AND FLIGHT TEST ENVIRONMENTS



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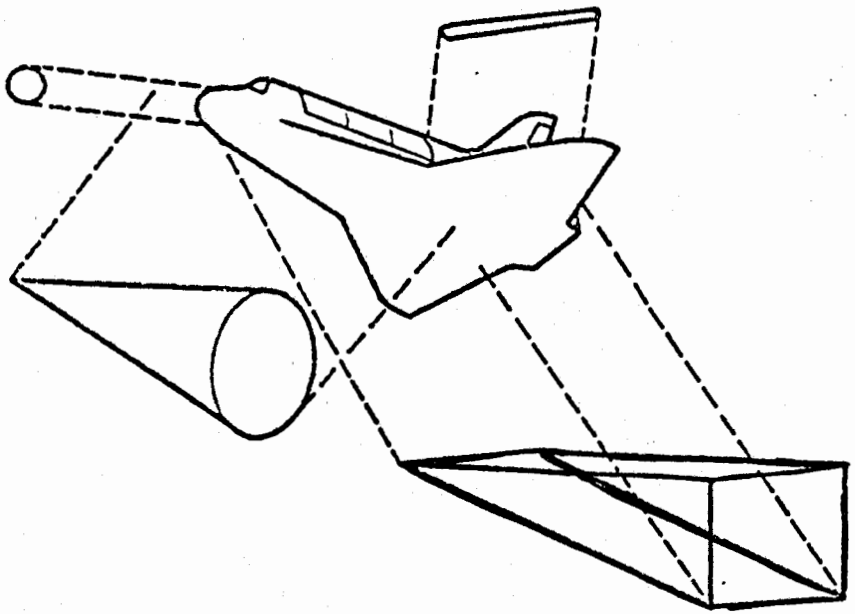
DESIGN HEATING METHODOLOGY

WIND TUNNEL CALIBRATION OF HEATING MODELS

REPRESENTATIVE FLOW MODELS



FUSELAGE LOWER CENTERLINE

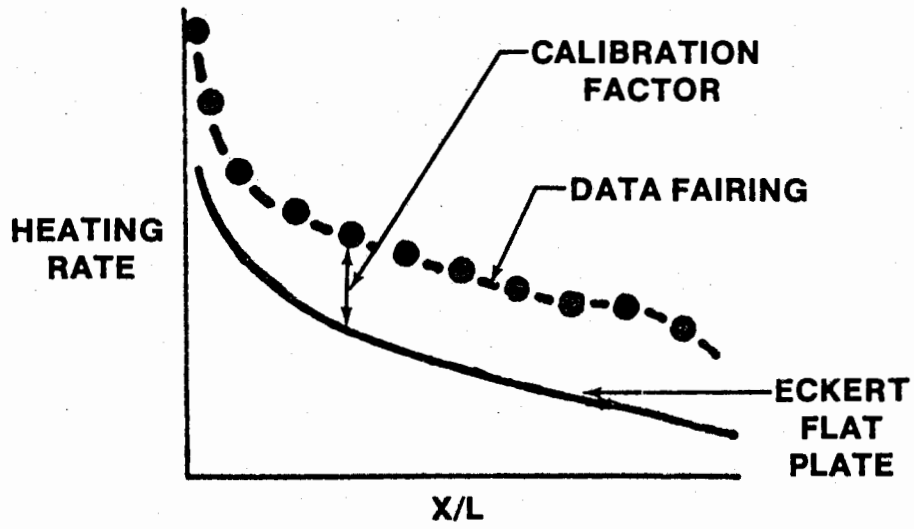


FIGURE 3

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LOGIC FOR PREDICTING BOUNDARY LAYER TRANSITION ON THE ORBITER

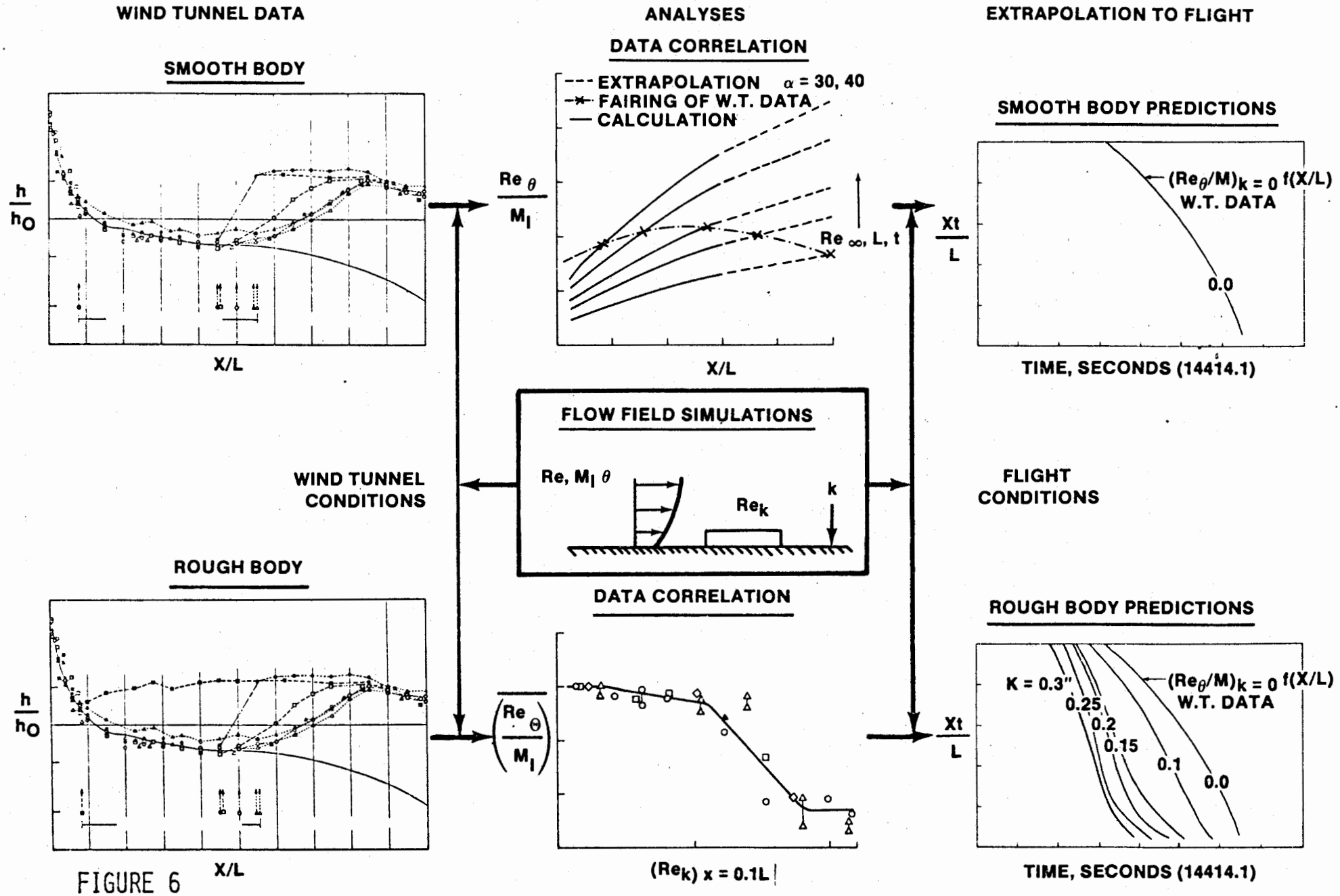

FIGURE 6

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SURFACE CATALYSIS FLIGHT PREDICTION PROCESS

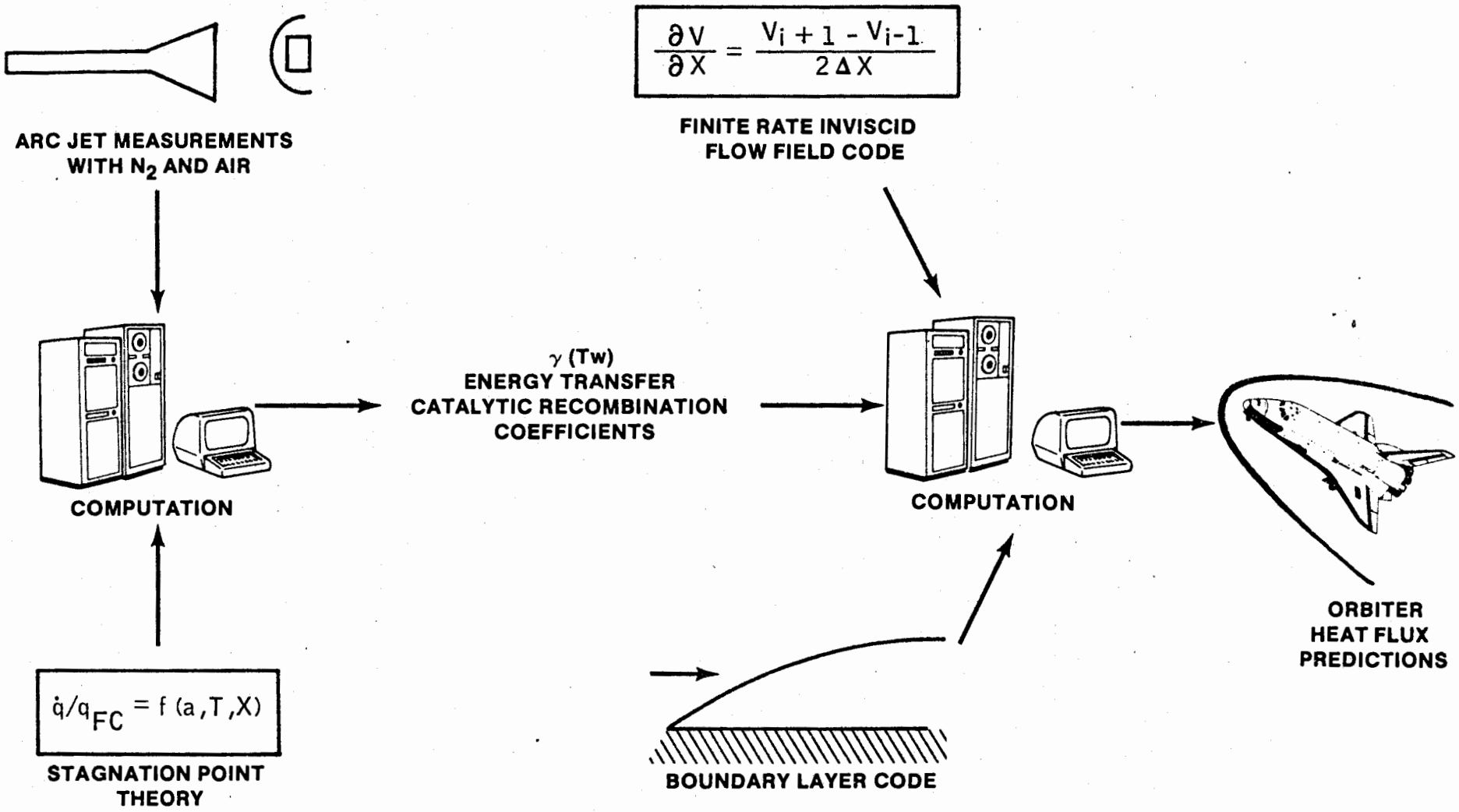
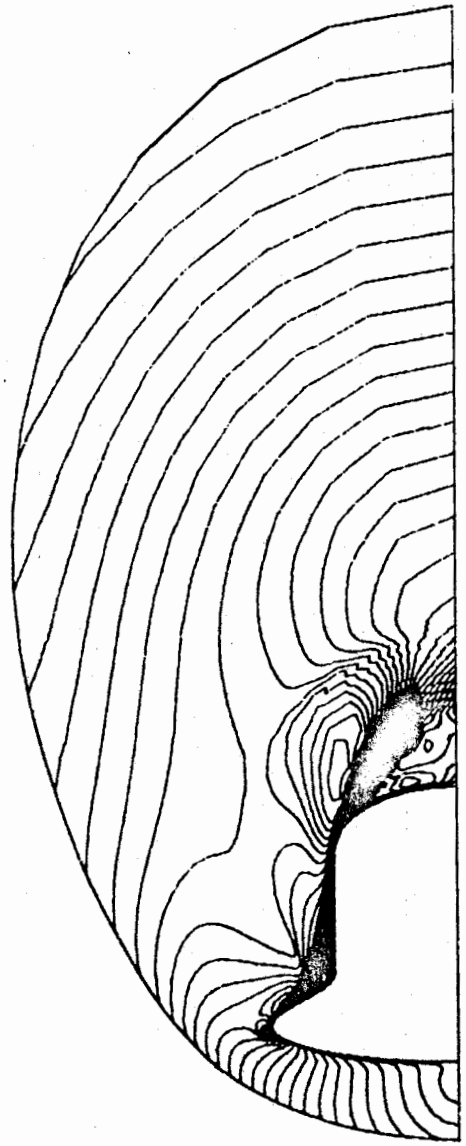
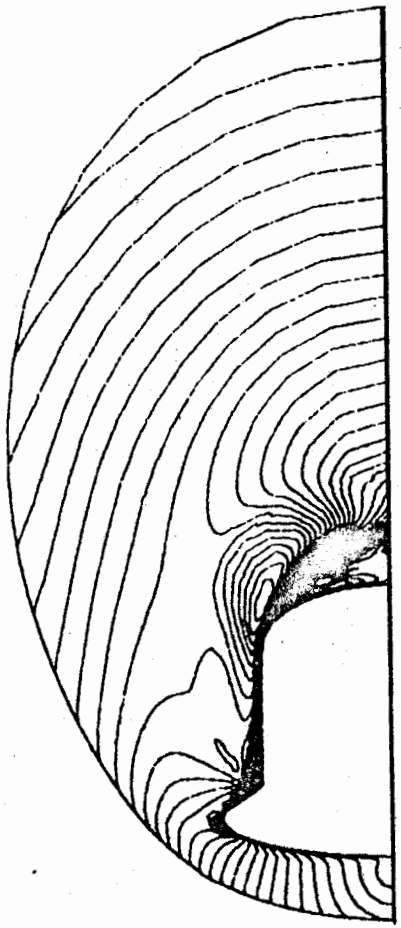


FIGURE 5

ORBITER FLOW FIELD RESULTS



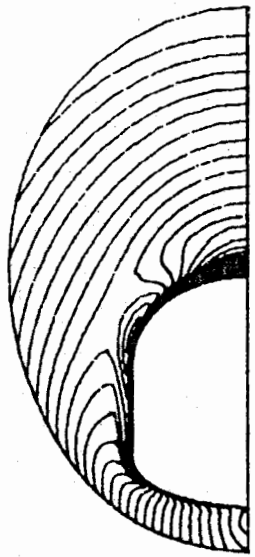
X/L = 0.5



0.4

CROSS FLOW SPEED CONTOURS

$\alpha = 30°$
$M_\infty = 8$
$Re_L = 2 \times 10^6$



0.2

FIGURE 4

COMPARISON OF STS-3 FLIGHT DATA WITH PREFLIGHT TEST PREDICTIONS: FORWARD WINDWARD CENTERLINE

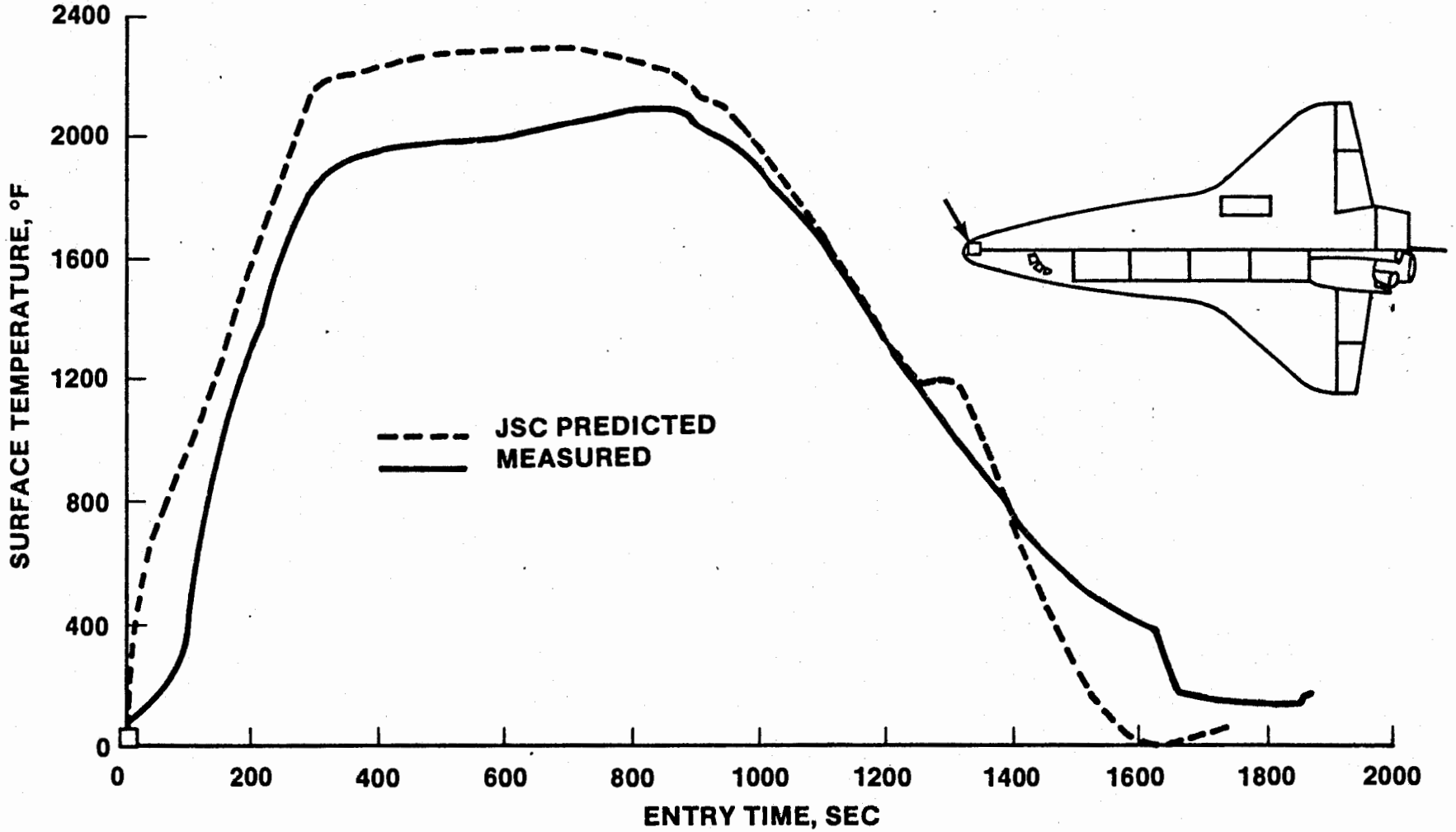


FIGURE 7A

COMPARISON OF STS-3 FLIGHT DATA WITH PREFLIGHT TEST PREDICTIONS: MIDBODY WINDWARD CENTERLINE

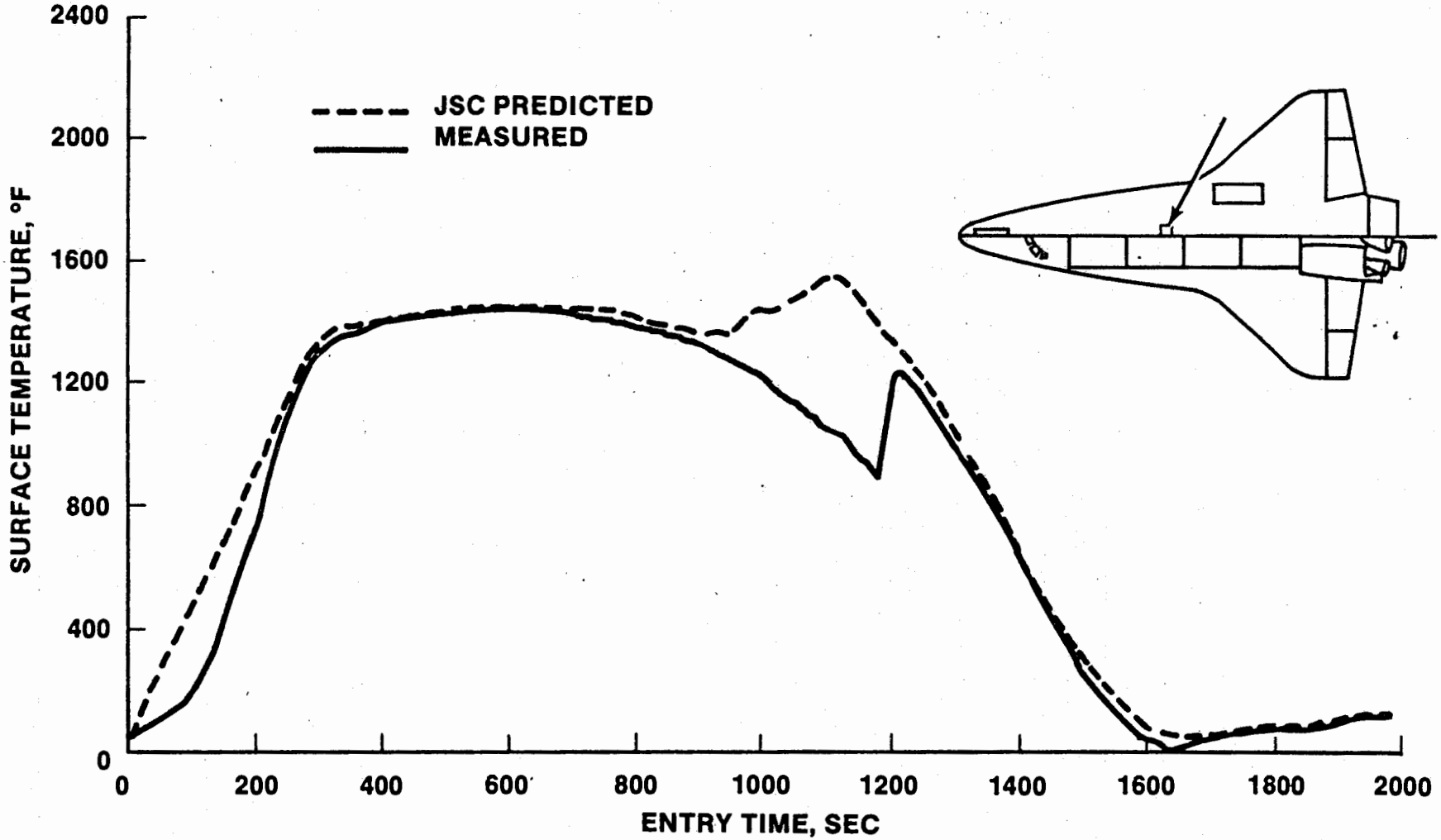


FIGURE 7B

COMPARISON OF STS-3 FLIGHT DATA WITH PREFLIGHT TEST PREDICTIONS: AFT WINDWARD CENTERLINE

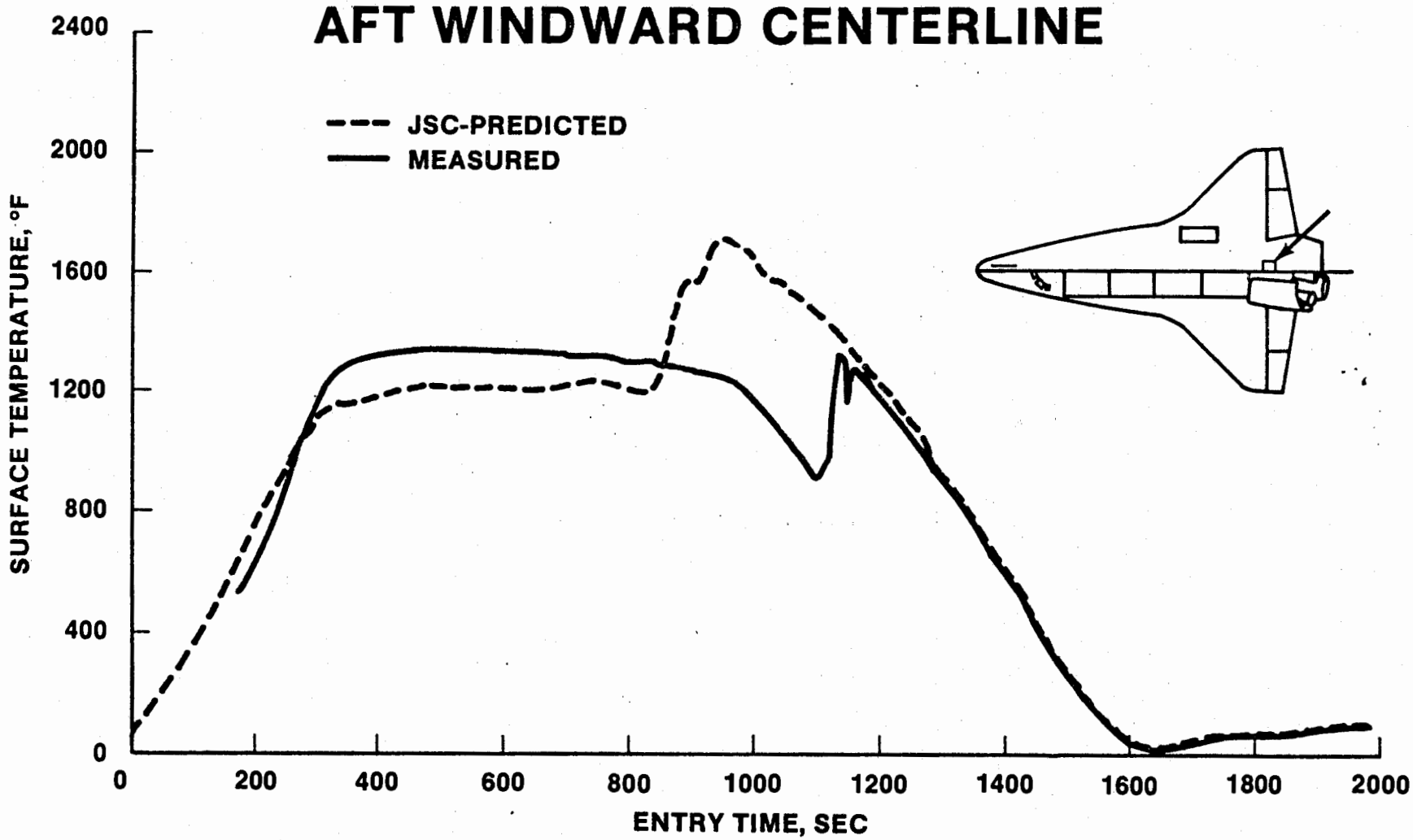


FIGURE 7C

STS-3, ORBITER INFERRED AND PREDICTED HEAT FLUX

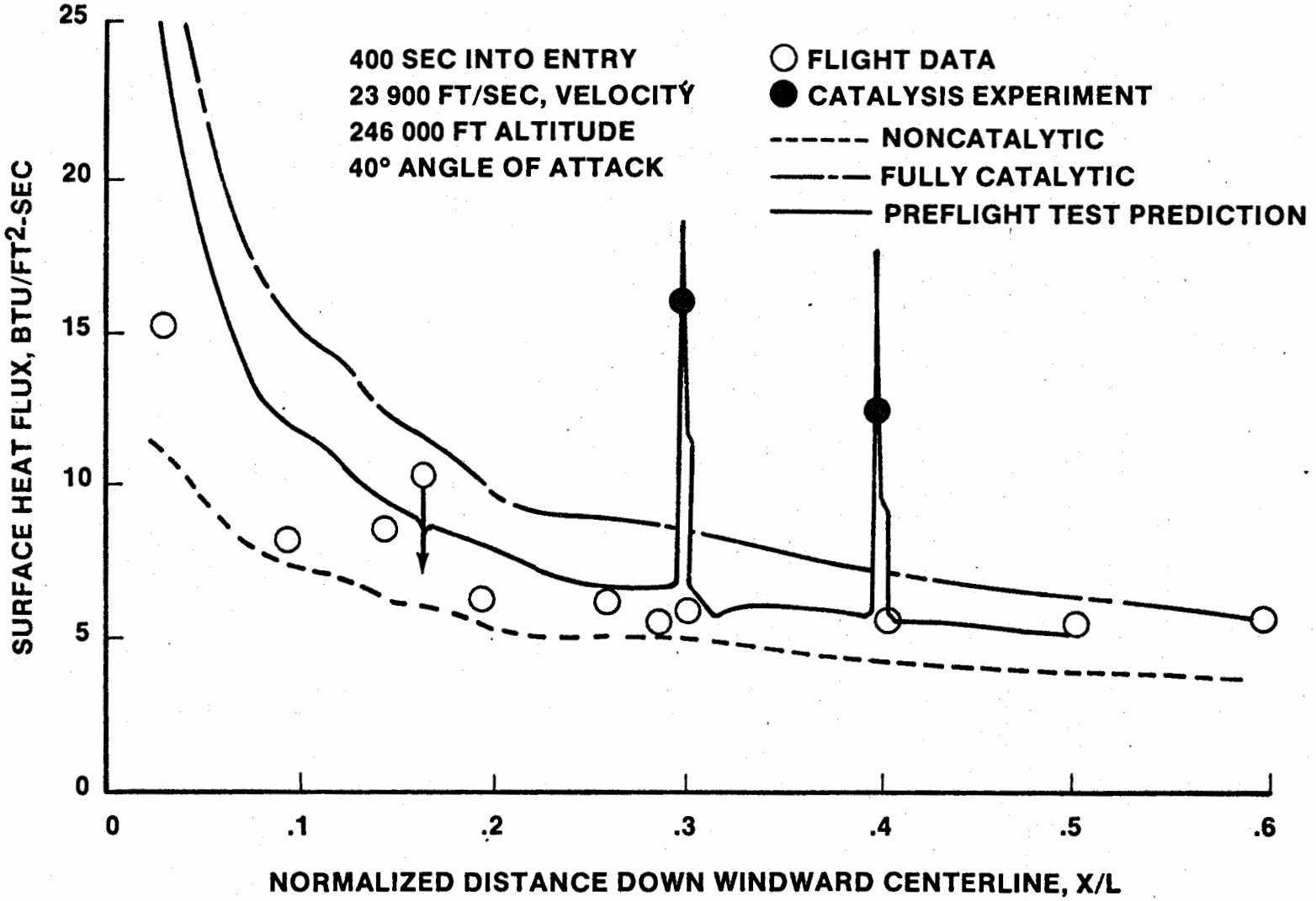
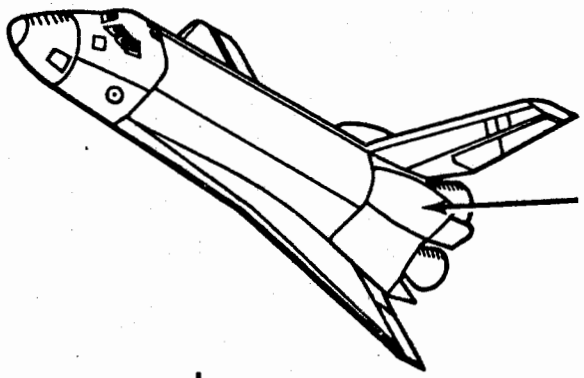


FIGURE 8

LEEWARD SURFACE FLIGHT DATA VS. REYNOLDS NUMBER



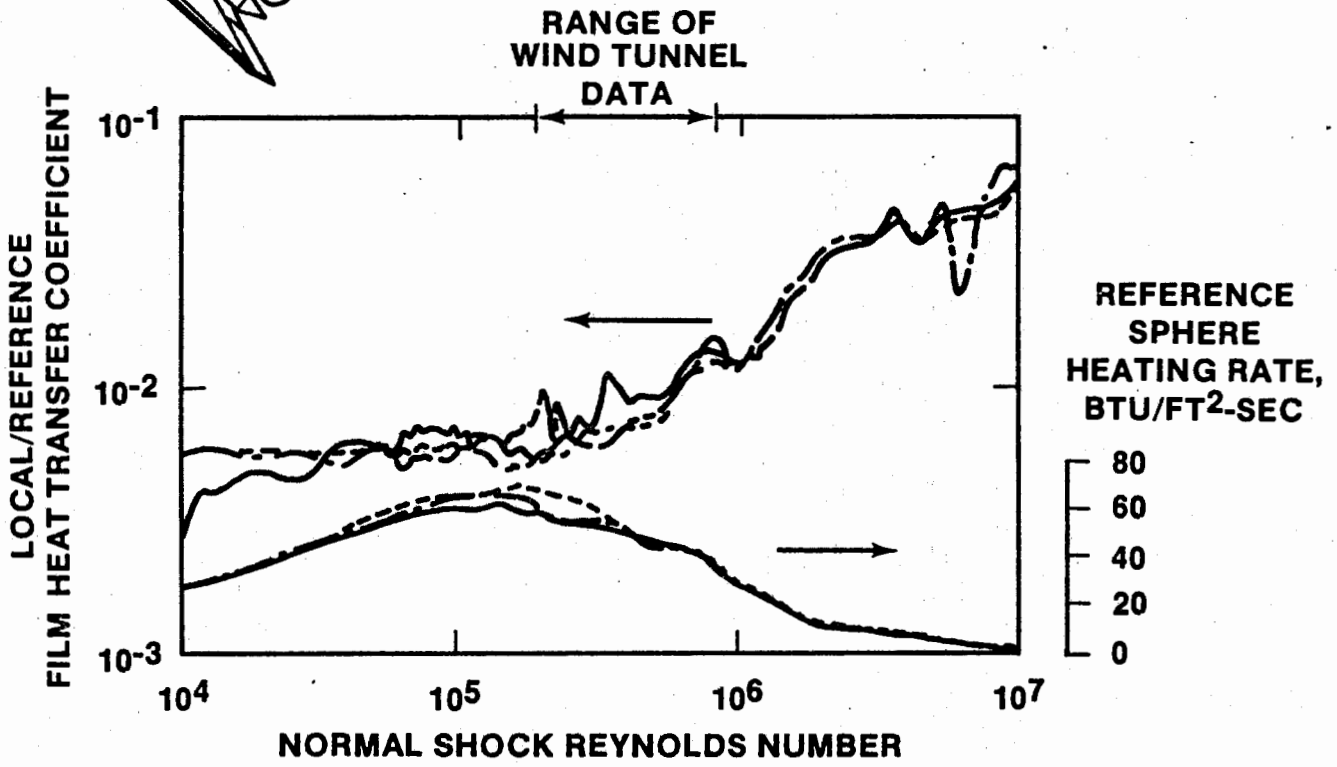
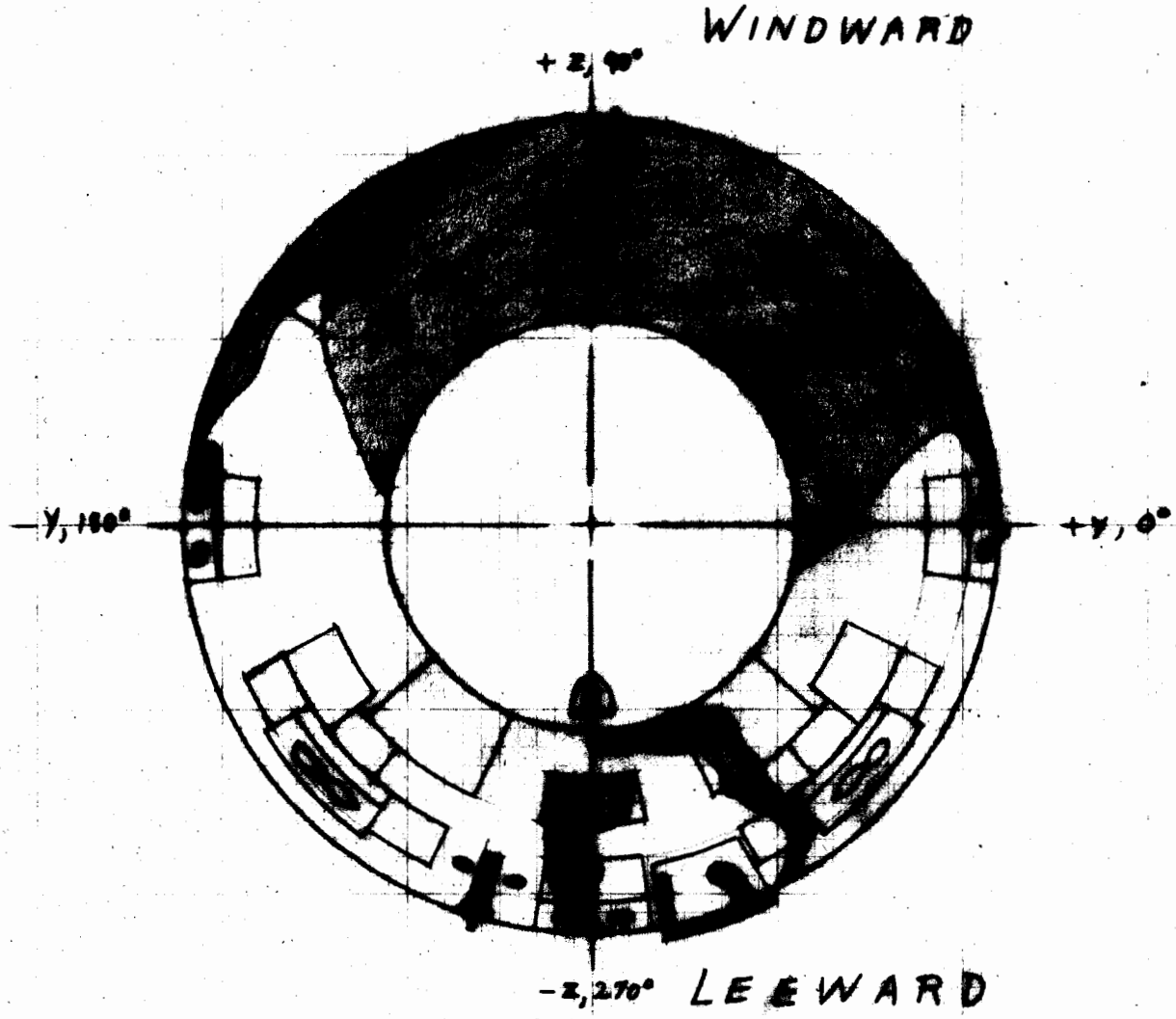


FIGURE 9



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ENTRY BONDLINE THERMAL RESPONSE, MIDBODY WINDWARD

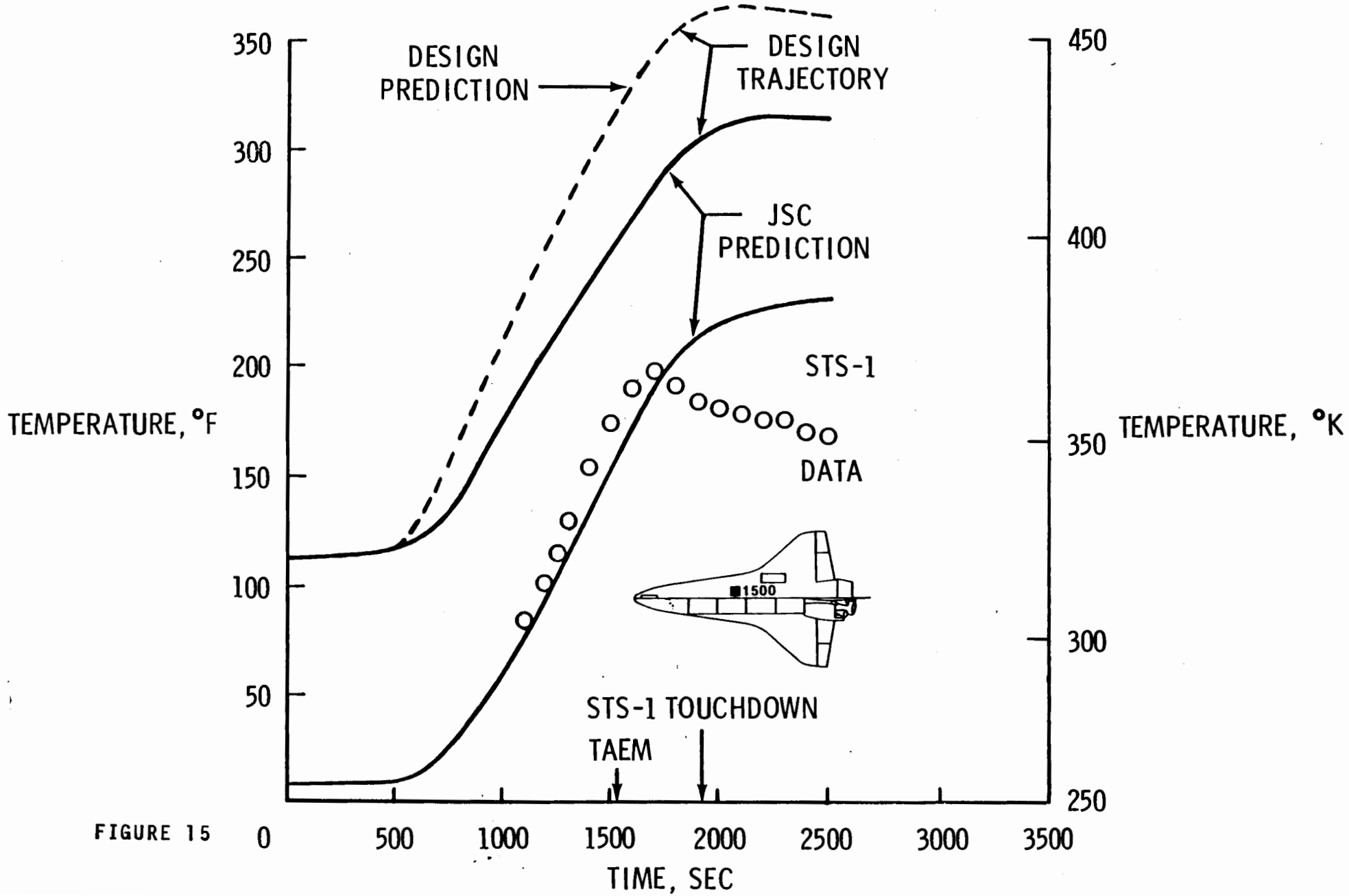

FIGURE 15

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MATRIX OF UNDERSTANDING