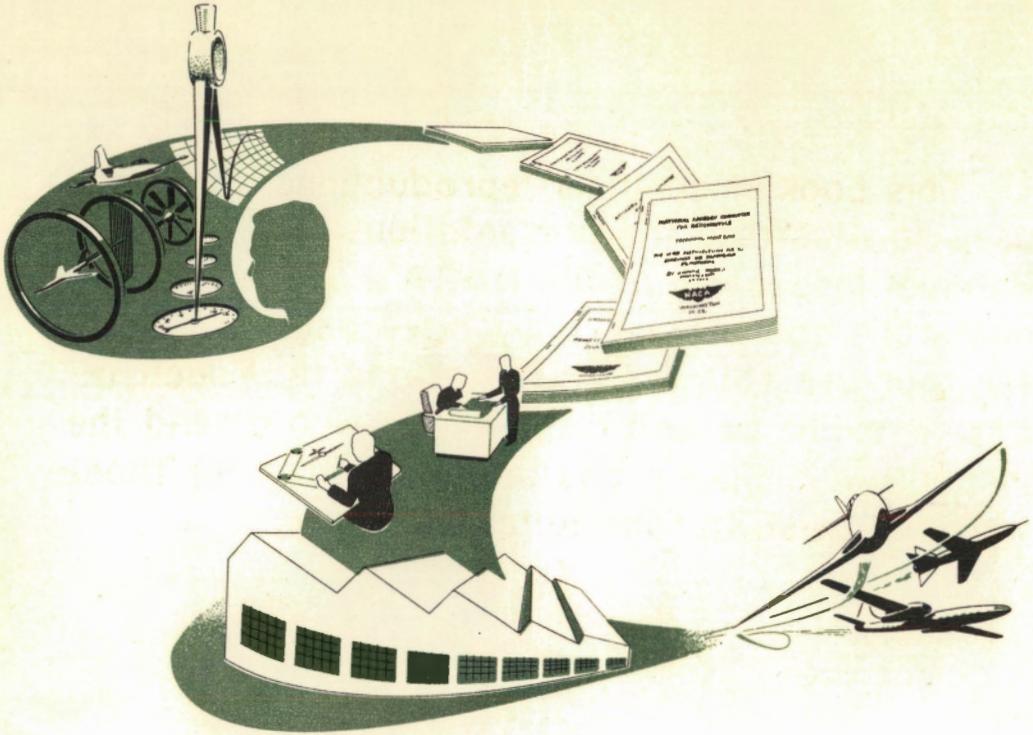
116.3-64

AMES AERONAUTICAL LABORATORY

1952 INSPECTION

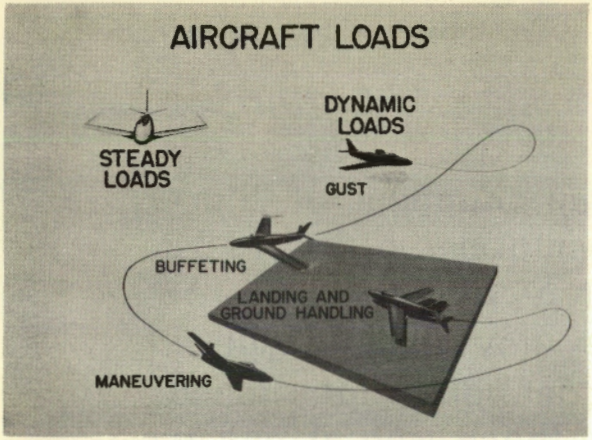
NACA

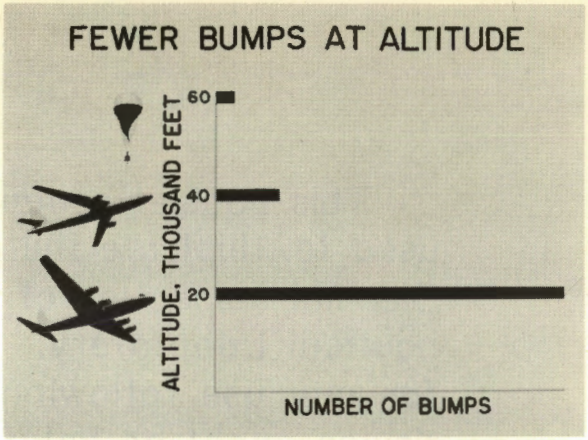
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS



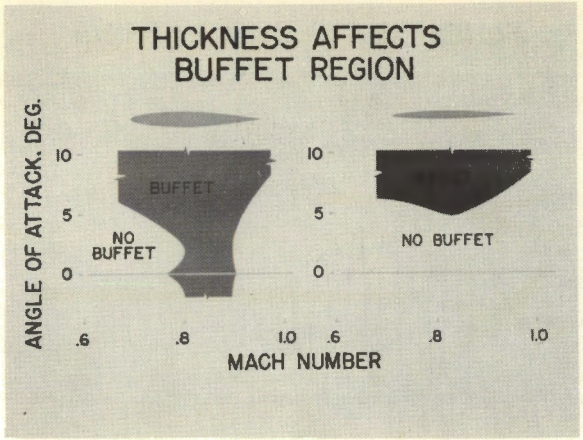
This booklet contains reproductions of charts used to illustrate the presentations at the 1952 Biennial Inspection of the NACA's Ames Aeronautical Laboratory. They have been prepared for your use following suggestions that such a device might be helpful to those who attend the Inspection. Space has been provided for those who may wish to take notes.

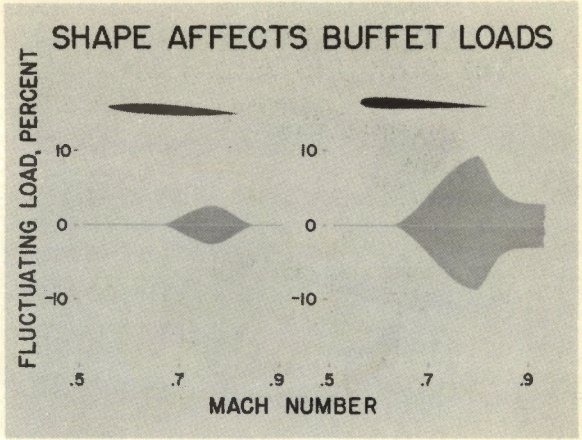
LOADS


AIRCRAFT LOADS
STEADY LOADS
DYNAMIC LOADS
GUST
BUFFETING
LANDING AND GROUND HANDLING
MANEUVERING

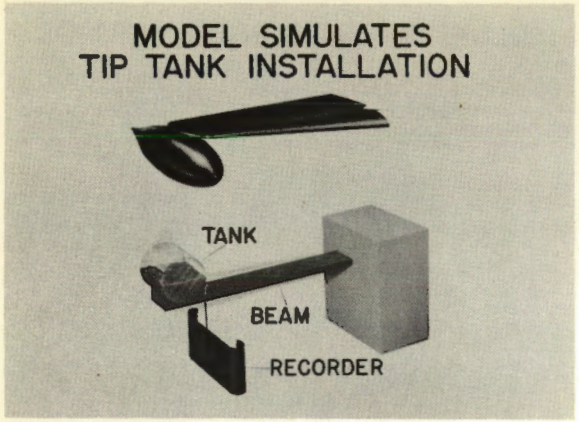

FEWER BUMPS AT ALTITUDE
ALTITUDE, THOUSAND FEET
60
40
20
NUMBER OF BUMPS

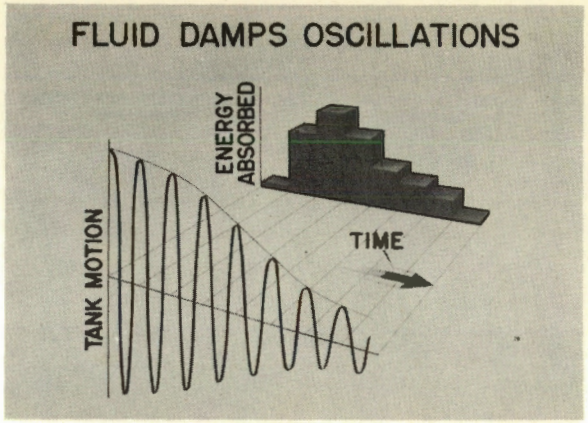
NOTES


THICKNESS AFFECTS
BUFFET REGION
ANGLE OF ATTACK, DEG.
10
5
0
BUFFET
NO
BUFFET
NO BUFFET
.6
.8
1.0
MACH NUMBER

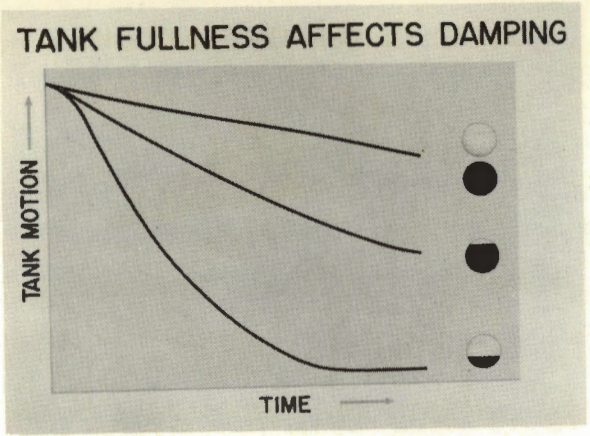

SHAPE AFFECTS BUFFET LOADS
FLUCTUATING LOAD, PERCENT
10
0
-10
.5
.7
.9
MACH NUMBER

NOTES


MODEL SIMULATES
TIP TANK INSTALLATION
TANK
BEAM
RECORDER

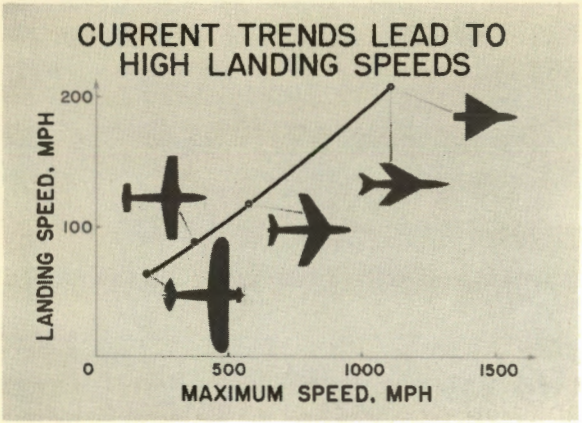

FLUID DAMPS OSCILLATIONS
ENERGY ABSORBED
TANK MOTION
TIME

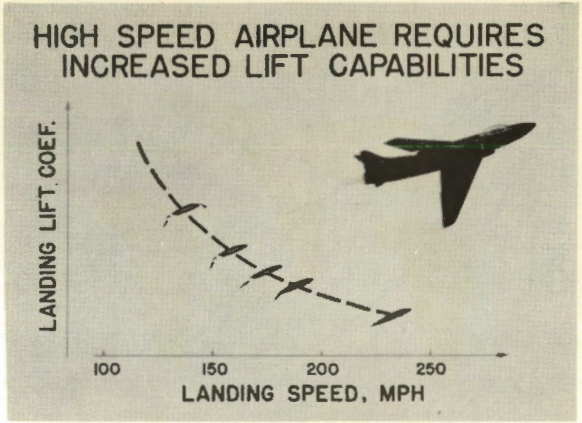
NOTES



NOTES

LANDING





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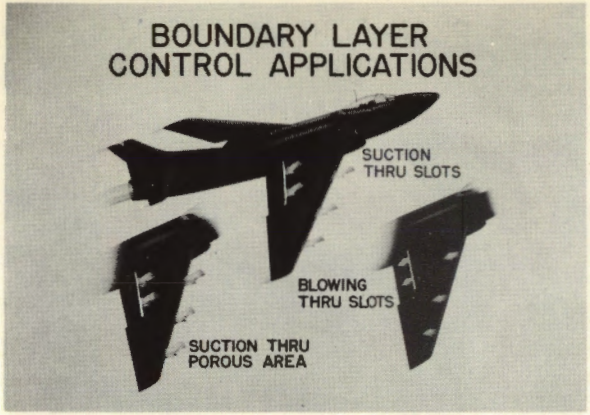
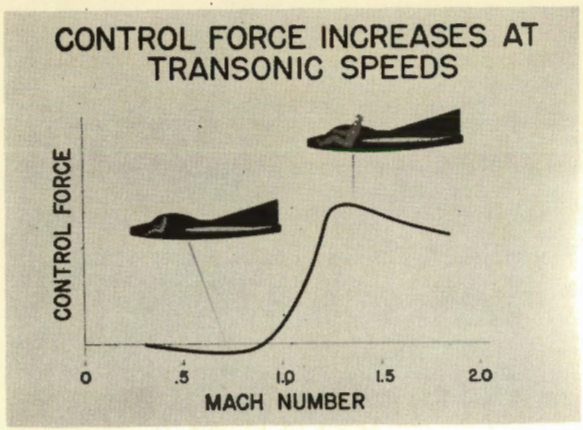

BOUNDARY LAYER
CONTROL APPLICATIONS
SUCTION
THRU SLOTS
BLOWING
THRU SLOTS
SUCTION THRU
POROUS AREA

NOTES

STATIC STABILITY AND CONTROL



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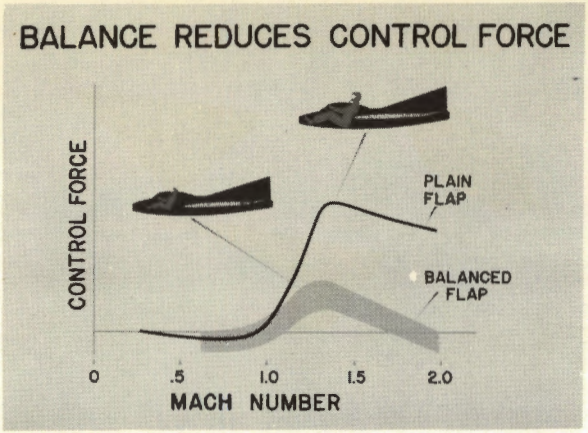
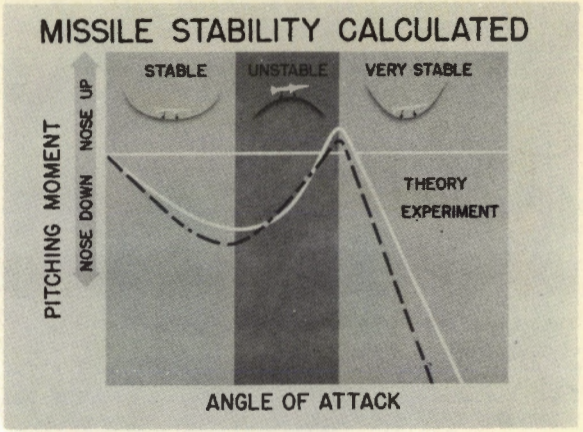
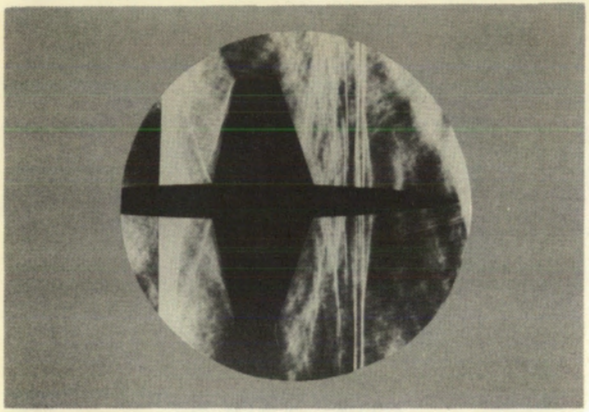

BALANCE REDUCES CONTROL FORCE
CONTROL FORCE
PLAIN FLAP
BALANCED FLAP
0
.5
1.0
1.5
2.0
MACH NUMBER

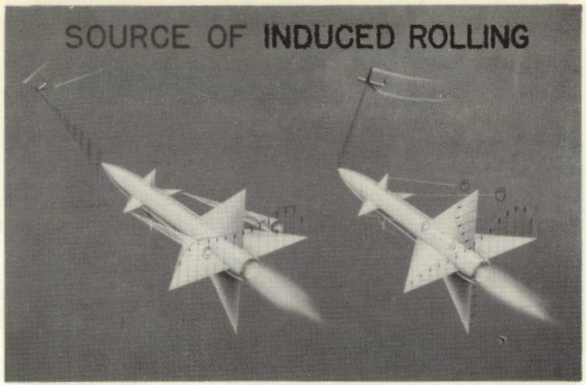

MISSILE STABILITY CALCULATED
STABLE
UNSTABLE
VERY STABLE
PITCHING MOMENT
NOSE DOWN
NOSE UP
THEORY
EXPERIMENT
ANGLE OF ATTACK

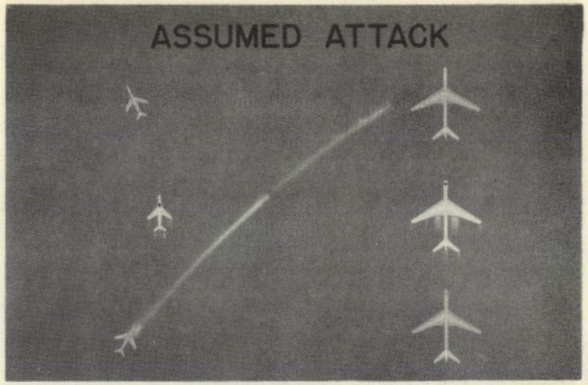
NOTES



NOTES

MISSILE DYNAMICS





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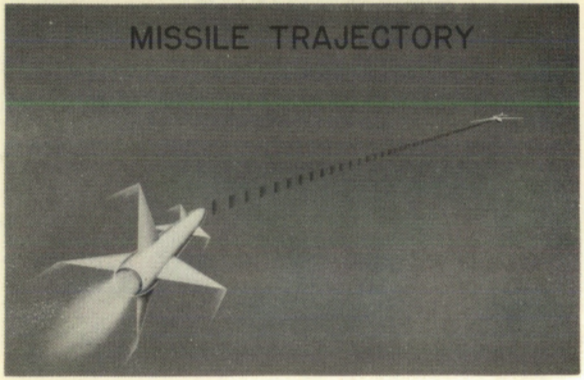
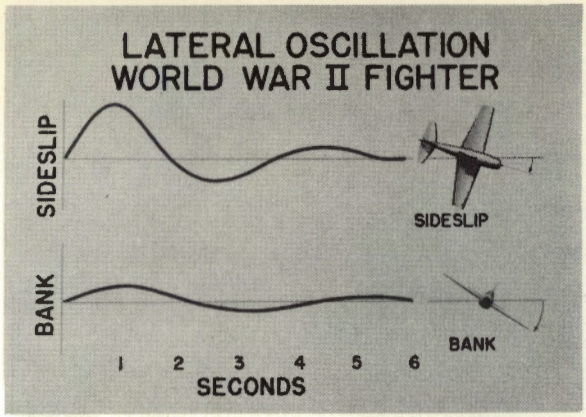
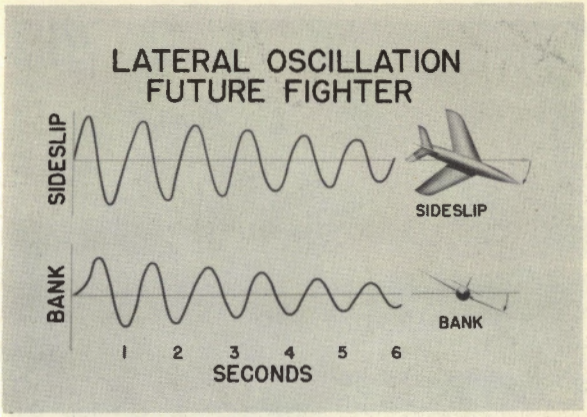


NOTES

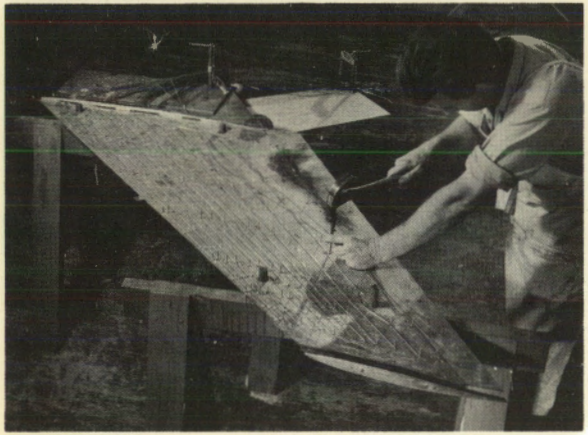
AUTOMATIC STABILITY AND CONTROL

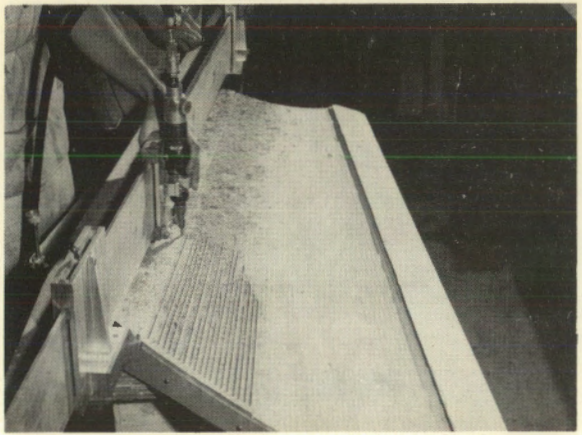




NOTES

MODEL CONSTRUCTION





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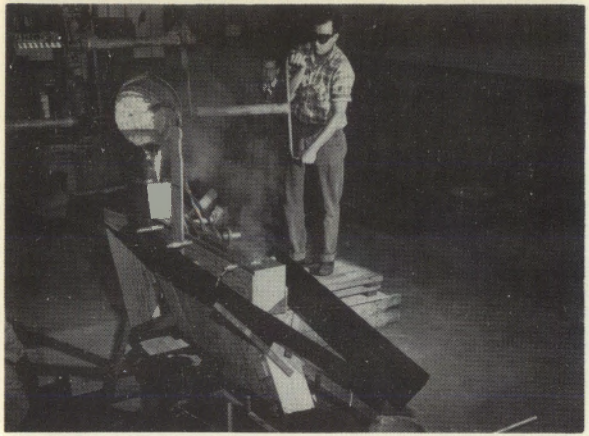

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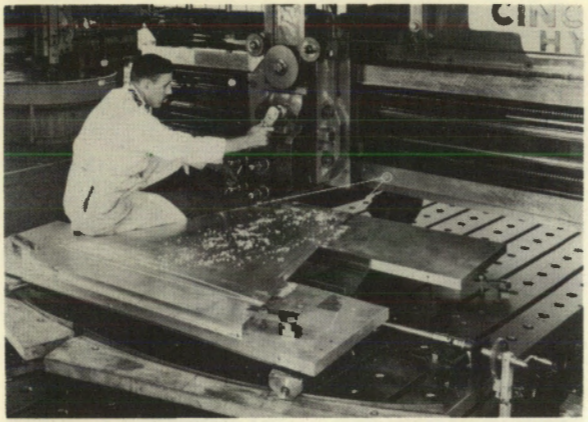
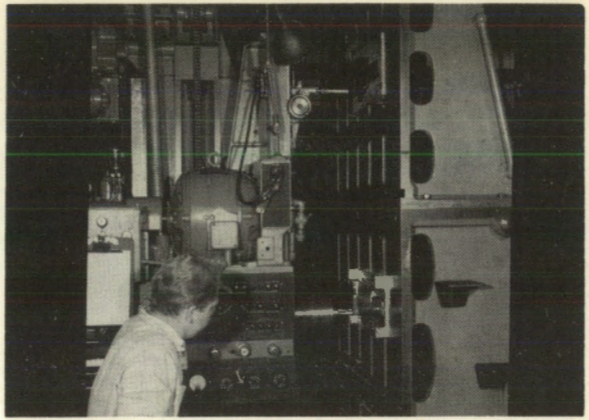
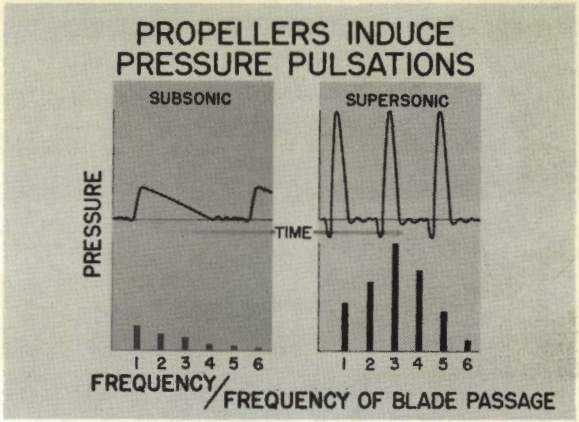




NOTES

PROPELLERS AND HELICOPTERS



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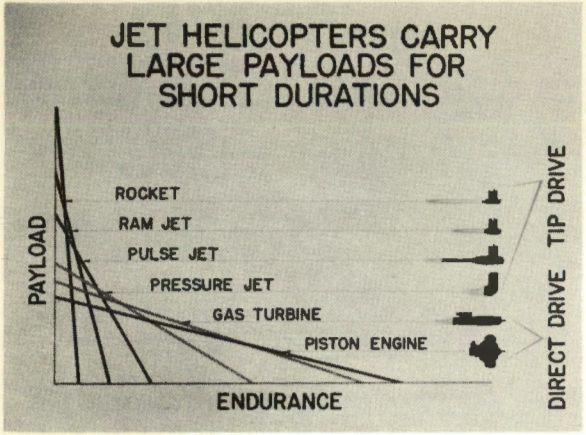
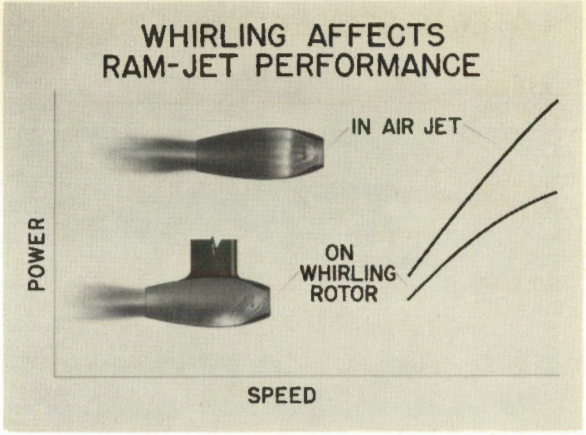
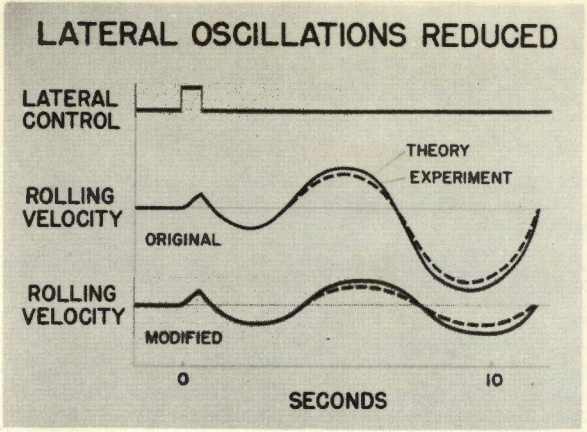

JET HELICOPTERS CARRY
LARGE PAYLOADS FOR
SHORT DURATIONS
PAYLOAD
ROCKET
RAM JET
PULSE JET
PRESSURE JET
GAS TURBINE
PISTON ENGINE
ENDURANCE
TIP DRIVE
DIRECT DRIVE

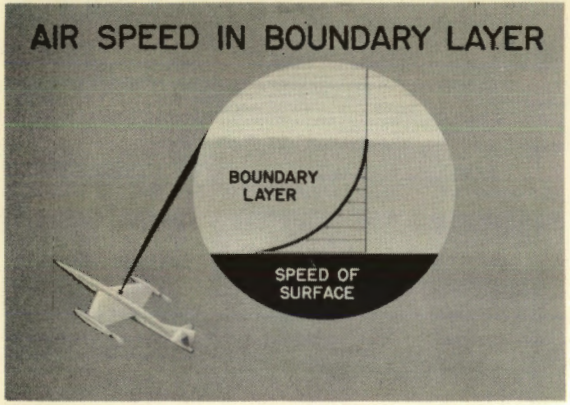

WHIRLING AFFECTS
RAM-JET PERFORMANCE
IN AIR JET
ON
WHIRLING
ROTOR
POWER
SPEED

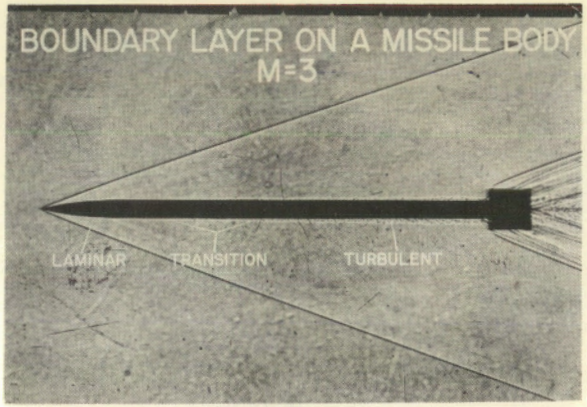
NOTES


LATERAL OSCILLATIONS REDUCED
LATERAL CONTROL
THEORY
EXPERIMENT
ROLLING VELOCITY
ORIGINAL
ROLLING VELOCITY
MODIFIED
0
10
SECONDS

NOTES

AERODYNAMIC FRICTION AND HEATING





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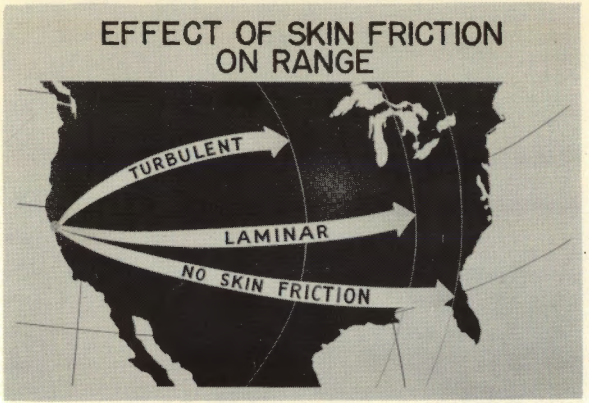
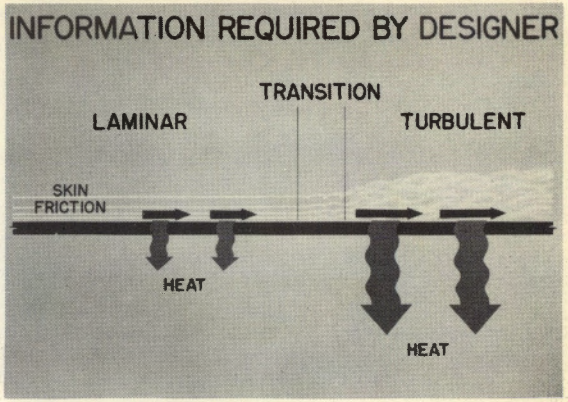
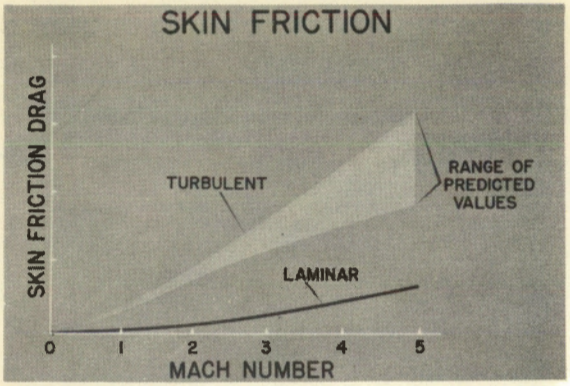

EFFECT OF SKIN FRICTION
ON RANGE
TURBULENT
LAMINAR
NO SKIN FRICTION

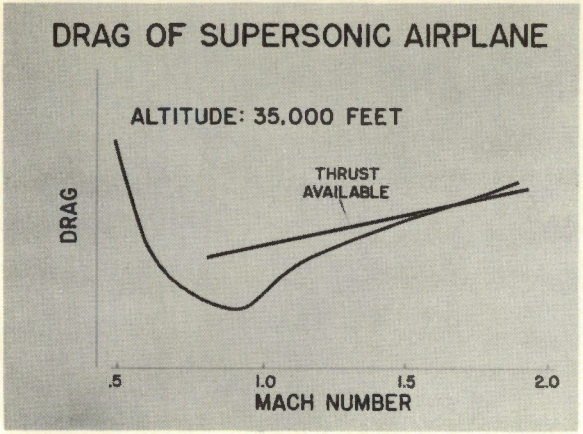

INFORMATION REQUIRED BY DESIGNER
TRANSITION
LAMINAR
TURBULENT
SKIN
FRICTION
HEAT
HEAT

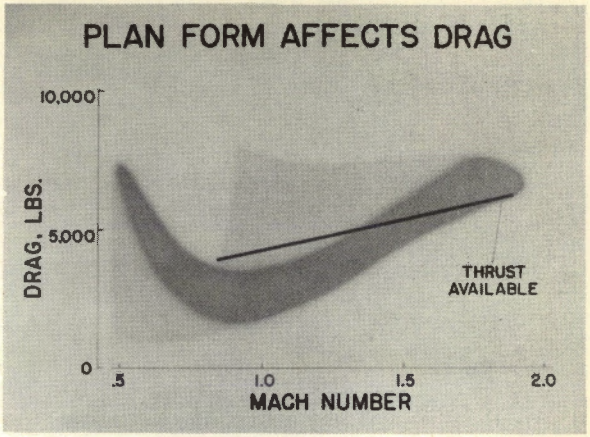
NOTES


SKIN FRICTION
SKIN FRICTION DRAG
TURBULENT
RANGE OF PREDICTED VALUES
LAMINAR
0
1
2
3
4
5
MACH NUMBER

NOTES

HIGH SPEED AND RANGE





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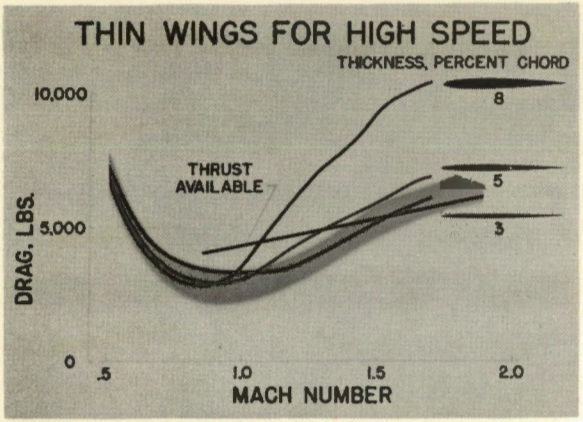
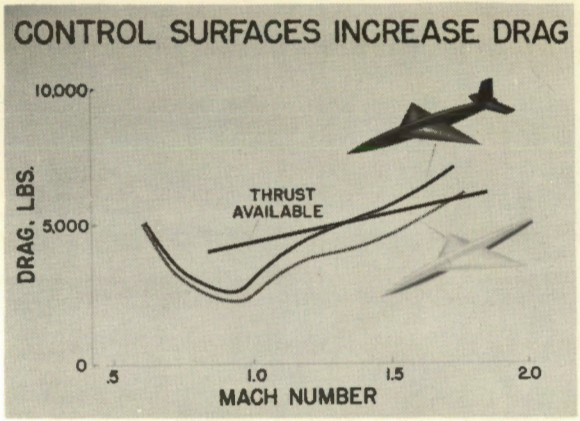
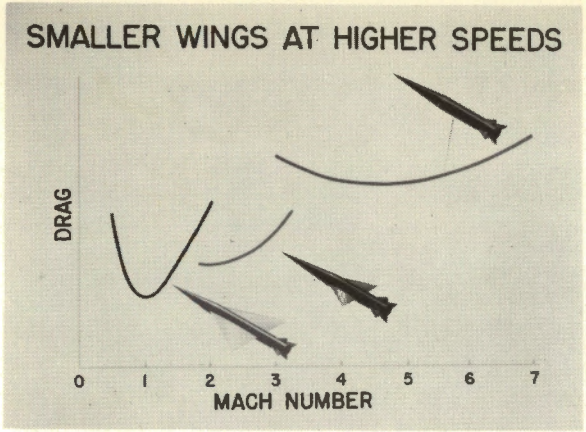
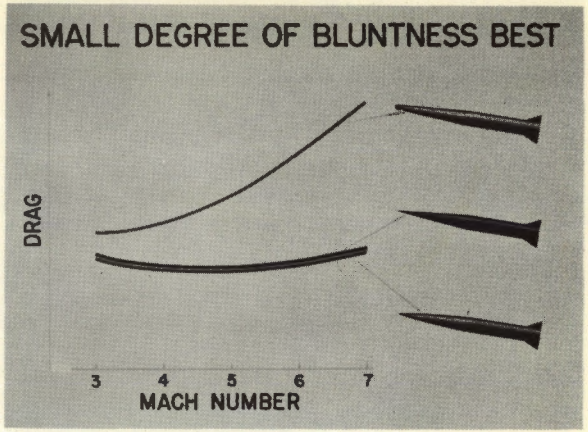

THIN WINGS FOR HIGH SPEED
THICKNESS, PERCENT CHORD
10,000
5,000
0
DRAG, LBS.
THRUST AVAILABLE
8
5
3
.5
1.0
1.5
2.0
MACH NUMBER

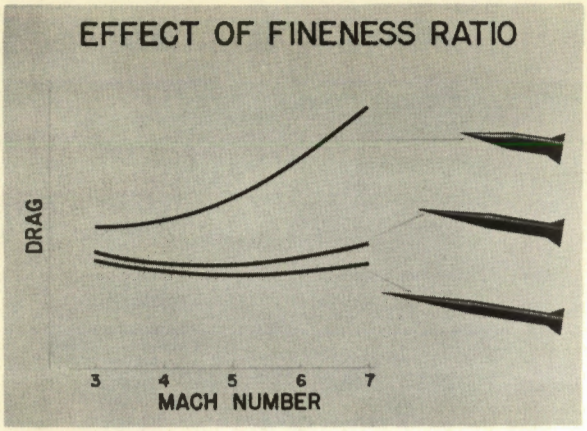

CONTROL SURFACES INCREASE DRAG
10,000
5,000
0
DRAG, LBS.
THRUST AVAILABLE
.5
1.0
1.5
2.0
MACH NUMBER

NOTES


SMALLER WINGS AT HIGHER SPEEDS
DRAG
0
1
2
3
4
5
6
7
MACH NUMBER

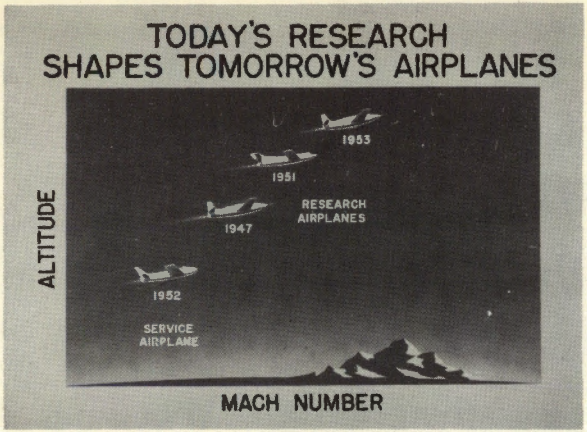

SMALL DEGREE OF BLUNTNESS BEST
DRAG
3
4
5
6
7
MACH NUMBER

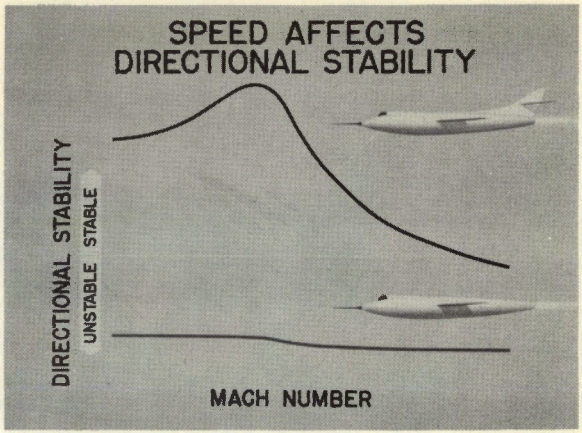
NOTES



NOTES

RESEARCH AIRPLANES





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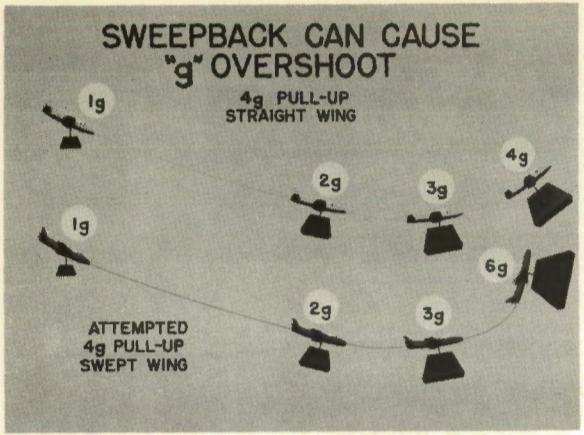
SWEEPBACK CAN CAUSE
"g" OVERSHOOT
4g PULL-UP
STRAIGHT WING
1g
1g
2g
3g
4g
6g
2g
3g
ATTEMPTED
4g PULL-UP
SWEPT WING

NOTES

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