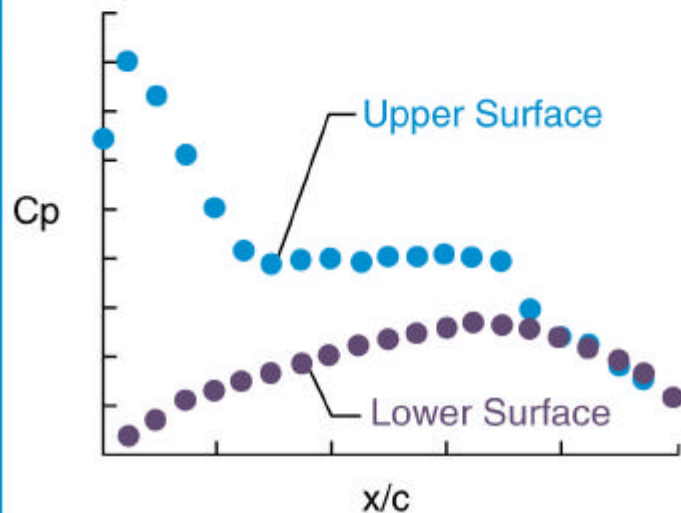


BASELINE RIGID SEMISPAN MODEL TEST COMPLETED IN TDT FOR HSR AEROELASTICITY PROGRAM

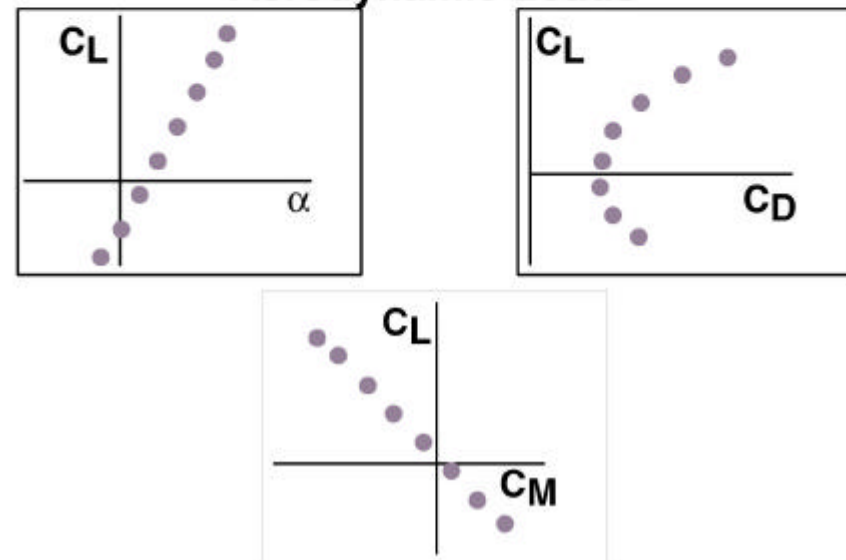


- Configurations
 - Engine nacelles on/off
 - East wall slots open/closed
- Data
 - Wing pressures
 - Fuselage pressures
 - Aerodynamic loads
 - Wing-tip deflections
- Test Conditions
 - R-12
 - $M = 0.70 - 1.15$
 - $\alpha = -2^\circ \rightarrow +8^\circ$

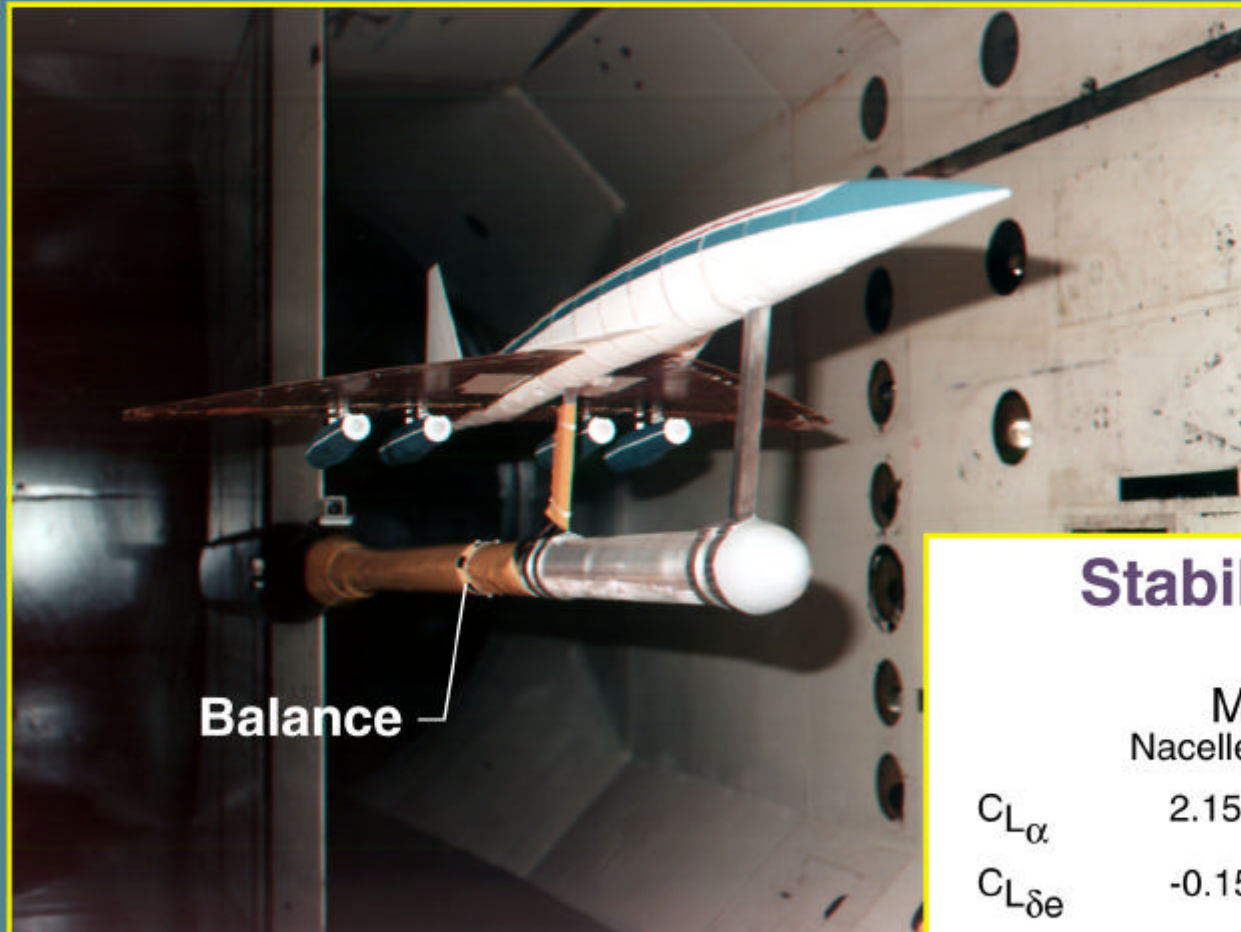
Wing Surface Pressures



Aerodynamic Loads



HSR ACTIVE CONTROLS TESTBED SUCCESSFULLY TESTED ON STING IN TDT



Stability Derivatives ($q=40$ psf)

	Measured		Calculated No Nacelles
	Nacelles	No Nacelles	
$C_{L\alpha}$	2.15	2.30	1.81
$C_{L\delta e}$	-0.157	-0.130	-0.08
$C_{l\delta ai}$	0.008	0.007	0.009
$C_{l\delta ao}$	0.026	0.030	0.016

SELECTED WING-STORE FLUTTER INVESTIGATIONS IN THE TRANSONIC DYNAMICS TUNNEL

F-111 (1960's)



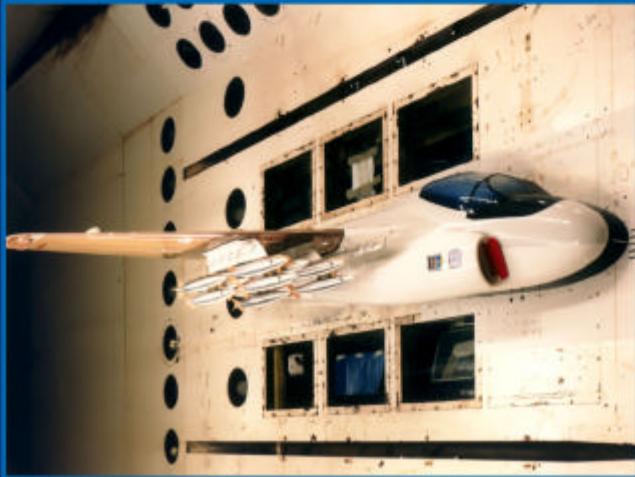
F-16 (1970's)



TRANSONIC DYNAMICS TUNNEL



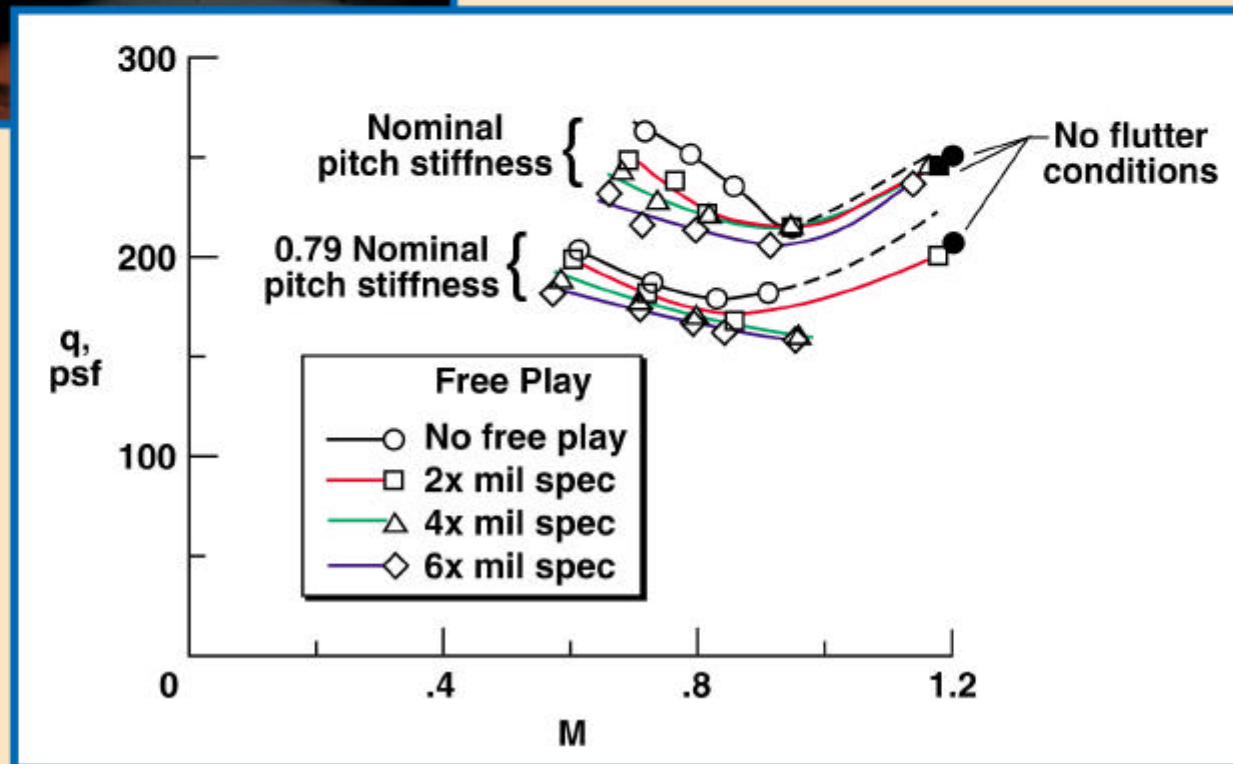
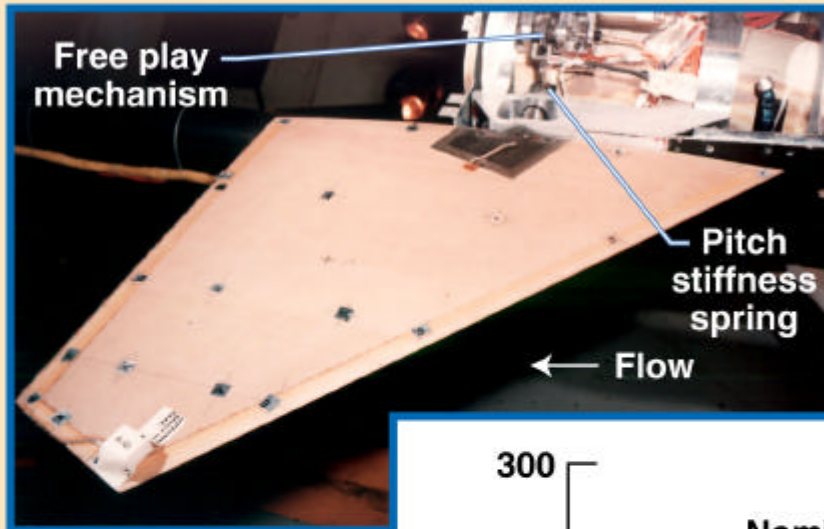
A-6 (1980's)



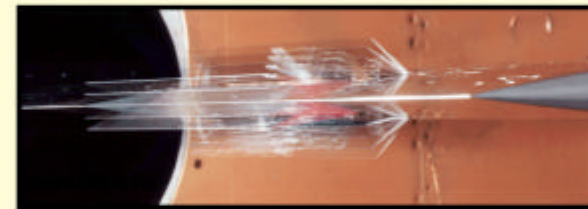
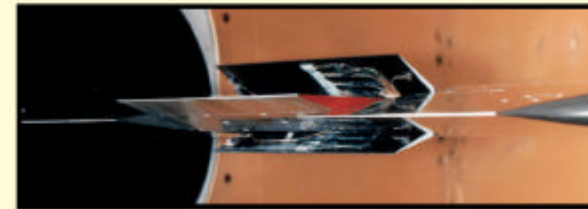
F/A-18 E/F (1990's)



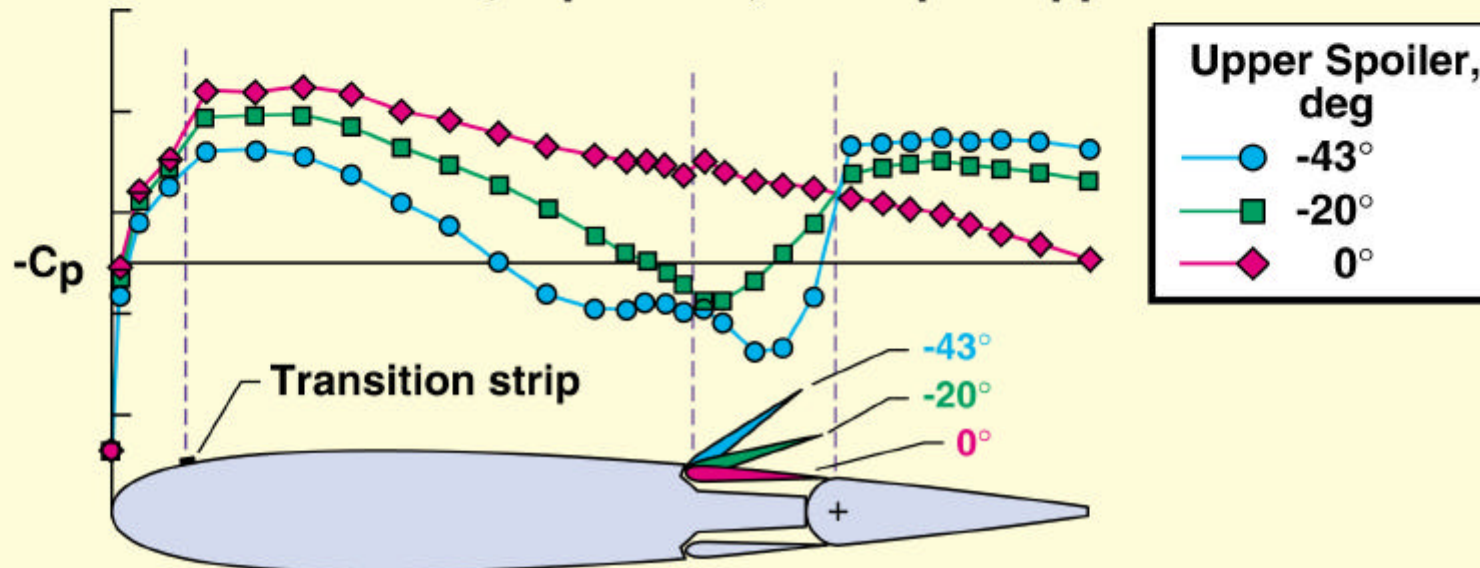
CONTROL SURFACE FREE PLAY EFFECTS ON FLUTTER STUDIED IN TDT



OPEN-LOOP SYSTEM CHARACTERISTICS OF THE BENCHMARK ACTIVE CONTROLS MODEL MEASURED



Mach = .77, Alpha = 0°, 60% Span Upper Surface



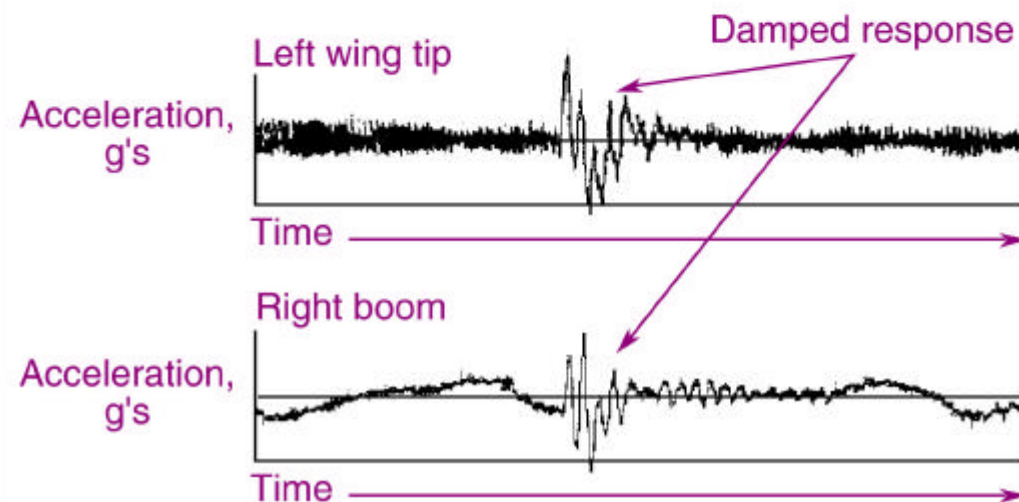
FLIGHT TEST SHOWS MODIFIED OV-10 AIRCRAFT FREE OF FLUTTER



Strip chart records

aileron stick rap

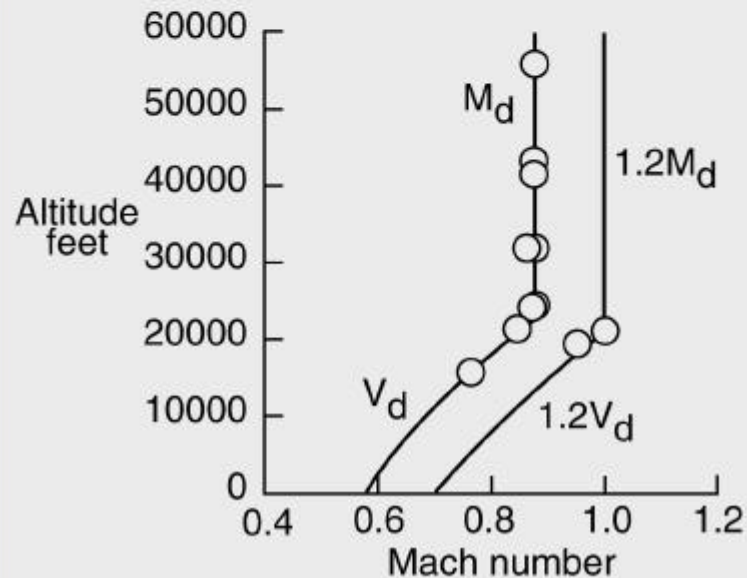
altitude = 5000 feet, velocity = 330 keas



LEARJET 45 FLUTTER CLEARED IN THE LANGLEY TRANSONIC DYNAMICS TUNNEL



Scaled tunnel conditions cleared as compared to actual flight envelope



Flutter points for modified wing configuration

