PEN00258

TEST LOG

FREE FLIGHT, 12 ft. TUNNEL
TEST NUMBER 12
DATE 1973

V = 72 ft/s
= 49 mph
M = 0.044
R = 0.46 × 10⁶ /ft.

MODEL Basic HYFAC
MOMENT REFERENCE
REYNOLDS NUMBER 2.3 × 10⁶
q = 6.2 #/ft²

MODEL CONFIGURATION	SURFACE DEFLECTION							RUN NUMBERS				
								α = 0 5 10 15 20	25 30			
	H_L	H_R	V_L	V_R				β = 0	β = +5	β = +10		
Basic HYFAC, BH,V,E$_R$ CP	+5	+5	0	0				10				
(small H&V tails)	0	0	0	0				3,41	16	17		
	-5	-5	0	0				4				
	-10	-10	0	0				5				
	-15	-15	0	0				6				
	-20	-20	0	0				7				
	-25	-25	0	0				8				
	-30	-30	0	0				9				
	+10	+10	0	0				11,12				
No Canopy HYFAC BH,V,E$_R$	0	0	0	0				13	23	24		
Body Alone B								30	31	32		
Body - Vert Tails BV,	0	0	0	0				27	28	29		
No Engine or Canopy BH,V,	0	0	0	0				14	25	26		
Attitude Loads BH,V,E$_R$ CP								1				
Lateral " "								2				

Attitude Loads

Base Pressure Measurements on Model & Engine Base.

TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE

MODEL ALTERED HYFAC

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION							RUN NUMBERS α = −5 to +30				
	H_L	H_R	V_L	V_R	V_3	C_L	C_R	β = 0	β = ±5	β = ±10		
Enlarged Vert. Tails, BV_2E_RCP	0	0	0	0	—	—	—	57	58	−58	1	✓
Central Vert. Tail, $BH_1V_1E_RCPV_3$	0	0	0	0	0			42	43	−43		✓
Canards, 2-Dim., $BH_1V_1E_RCPC_1$	0	0	0	0	—	0	0	19	65	65		✓
(Small Canards)						+5	+5	22				✓
						+10	+10	34				✓
						+15	+15	35				✓
Cent. Vert. tail & Canards $BH_1V_1E_RCPC_1V_3$	0	0	0	0	0	0	0	66	−66	−66		
Canards, Delta., $BH_1V_1E_RCPC_2$	0	0	0	0	—	0	0	36	37			✓
(Small Delta Canards)						+5	+5	38				✓
						+10	+10	39				✓
						+15	+15	40				✓
⟹							>	α = 0°, β = −10, −8, −6, −4, −2, 0, 2, 4, 6, 8, 10				
HYFAC, $BH_1V_1E_RCP$	0	0	0	0				18				✓

TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE

MODEL Altered HYFAC

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION							RUN NUMBERS				
	H_L	H_R				C_L	C_R	$\beta=0$	$\beta=5$	$\beta=10$		
Enlarged Hori. Tails $BH_2V_2E_RCP$	10	10						61	-61	-61		
& Vert. tails	0	0						60	-60	-60		
	-10	-10						62				
	-20	-20						63	-63	-63		
	-30	-30						64	65	-65		
Engine Open Duct $BH_1V_1E_O$	0	0	0	0				15				
Enlarged 2 Dim. Canards $BH_1V_1E_RCP_{C_2}$	0	0				0	0	44				
Enlarged Δ Canards, $BH_1V_1E_RCP_{C_4}$	0	0				0	0	55				
HAFAC Body Alone (B) Extd Transition								33		On nominal nose - no tail		

TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE

MODEL HYFAC

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION							RUN NUMBERS $\alpha = 0, 30, 0$				
								Attitude Coord Run No.		For Data Run	No.—	
B H, V, E_R CP C_3								45		44	1	Attitude Loads
B H, V, E_R								46		13, 23,	24	11
B H, V,								47		14, 25,	26	11
B V,								48		27, 28,	29	11
B								49		30, 31,	32, 33	11
B H, V, E_0 CP								50		15		11
B H, V, E_R CP C_1								51		19, 22, 34,	35, 65	11
B H, V, E_R CP C_2								52		36, 37, 38,	39, 40	11
B H, V, E_R CP V_3								53		42, 43		11
B H, V, E_R CP C_4								54		55		11
B V_2 E_R CP								56		57, 58		11
B H, V_2 E_R CP								59		60, 61, 62,	63, 64, 65	11
B H, V, E_R CP C_1 V_3								67		66		11

TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE

MODEL Winged HRA

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION δ_{H_L}	δ_{H_R}	δ_{V_L}	δ_{V_R}				RUN NUMBERS β=0	β=5	β=10		
WHRA (TRANS. FREE) No engine No canopy	0	0	0	0				69	-69	-69		
WHRA (Tran. Fixed) No engine With canopy	0	0	0	0				73	-73	-73		
WHRA (" ") No engine No canopy	0	0						71	-71	-71	0	
	+10	+10						74				
	+5	+5						75				
	-5	-5						87				
	-10	-10						88				
	-15	-15						93				eng. pin hole open & closed
	-20	-20						94				
	-25	-25						99				
	-30	-30						100				
WHRA (Tran. Fixed) No canopy " engine	-10	+10	0	0				103				Roll control
WHRA (Tran Fixed) No canopy No engine	0	0	10	10				104				Yaw control

TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE

MODEL Winged HRA

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION							RUN NUMBERS				
WHRA, No engine " canopy								70			1	Attitude Loads
" No engine with canopy								72				
No canopy with open engine								76				
No canopy with closed engine								78				
WHRA								68				Initial Loads

TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE

MODEL

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION δ_{H_L}	SURFACE DEFLECTION δ_{H_R}	RUN NUMBERS $\beta=0$	RUN NUMBERS $\beta=5$	RUN NUMBERS $\beta=10$
WHRA (E_0, open Eng.) No canopy with g.i.	+10	+10	81		
	+5	+5	77		
	0	0	82	84	84
	-5	-5	85		
	-10	-10	90		
	-15	-15	91		
	-20	-20	95		
	-25	-25	98		
	-30	-30	101		

TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE

MODEL WHRA

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION δH_L	δH_R	δC_L	δC_R				RUN NUMBERS $\beta=0$	$\beta=5$	$\beta=10$	
WHRA (E_R, closed Enq) No canopy with suit	+10	+10						80			
	+5	+5						79			
	0	0						83	--83	--83	
	-5	-5						86			
	-10	-10						89			
	-15	-15						92			
	-20	-20						96			
	-25	-25						97			
	-30	-30						102			
WHRA (No canopy No engine) C_2 Small Δ canard	0	0	0	0				105			
" " C_1 Small 2 Dim canard	0	0	0	0				106			

TEST LOG

11-INCH HYPERSONIC TUNNEL
TEST NUMBER 12
DATE 1-16-73

Balance FF04R

MODEL WHRA (Winged HYFAC)
MOMENT REFERENCE
REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION δ_{H_L}	δ_{H_R}	RUN NUMBERS $\alpha = 0° - 30°$ $\beta = 0$	$\beta = +5$	$\beta = +10$	
WHRA, No Eng No Canopy, With Tip Fin.	0	0	107			Initial Loads
" "			108			Attitude Loads
" "			109	109	109	Data
WHRA, No Eng No Canopy, With both Tip Fins & Cent. Vert. Tail			110			Attitude Loads
" "			111	111	111	Data
WHRA No Eng No Canopy, No Tip Fins With Cent. Vert Tail	0	0	112	112	112	Data.
" "	0	0	113			Attitude Loads
" "	-5	-5	114			Data.
" "	-10	-10	115			
" "	-15	-15	116			
" "	-20	-20	117			
" "	-25	-25	118			
" "	-30	-30	119			

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TEST LOG

FREE FLIGHT TUNNEL

TEST NUMBER 12

DATE 1-18-73

MODEL WHRA

MOMENT REFERENCE

REYNOLDS NUMBER

MODEL CONFIGURATION	SURFACE DEFLECTION δ_{H_L}	SURFACE DEFLECTION δ_{H_R}						RUN NUMBERS 0	RUN NUMBERS +5			
WHRA No Engine No Tip Fins. With Canopy With Ctr. V. Tail	0	0						120	120			✓
WHRA ER Retract Eng. No Tip Fins. No Canopy with ctr. V. Tail	0	0						121	121			✓
" EO Open Eng. No Canopy "	0	0						122	122			
" ER Retract Eng "	0	0						123				✓
" EO Open Engine No Tip Fins No Ctr. V. Tail	0	0						124	124			
" ER Retract Eng "	0	0						125	125			
" No Eng "	0	0						126	126			
" No Eng "	0	0						127	127			

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For Flight.

TEST LOG

11-INCH ~~HYPERSONIC~~ TUNNEL

TEST NUMBER _____

DATE _____

MODEL _____

MOMENT REFERENCE _____

REYNOLDS NUMBER _____

MODEL CONFIGURATION	SURFACE DEFLECTION							RUN NUMBERS				
2)HRA No Eng With Canopy	No Tip Fins With Ct. V.Tail							128				Attitude Lat. 15
" Eo, Open Eng No Canopy	"							129				"
" No Engine No Canopy	No Tip Fins No Ct. V.Tail							130				"
" Eo Engine With Canopy	"							131				"
" Eo Open Eng. No Canopy	"							132				"
" ER Retract. Eng No Canopy	"							133				"

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