

LANGLEY RESEARCH CENTER

FACILITY LOCATION Hampton, Virginia 23665
FACILITY NUMBER 720-B
FACILITY NAME Vortex Research Facility
FUNCTIONAL NAME Static Air Tunnel, Subsonic
TECHNOLOGICAL AREAS Studies of wake flow, specifically vortex flow, resulting from the motion of aircraft

INITIAL COST	\$ 493 K	YR. BUILT	1942	STATUS CODE	Active
ACCUM. COST \$ 1,000 K (est)		NASA B.O.D.	1973*	OWNER CODE	NASA
LIFE EXPECT.	Indef.			OPER. CODE	NASA

* Completion of modification

CONTRACTOR NAME
(if contr. oper.)

POTENTIAL This facility can be used for aerodynamic noise measurements and possibly for terminal area studies.

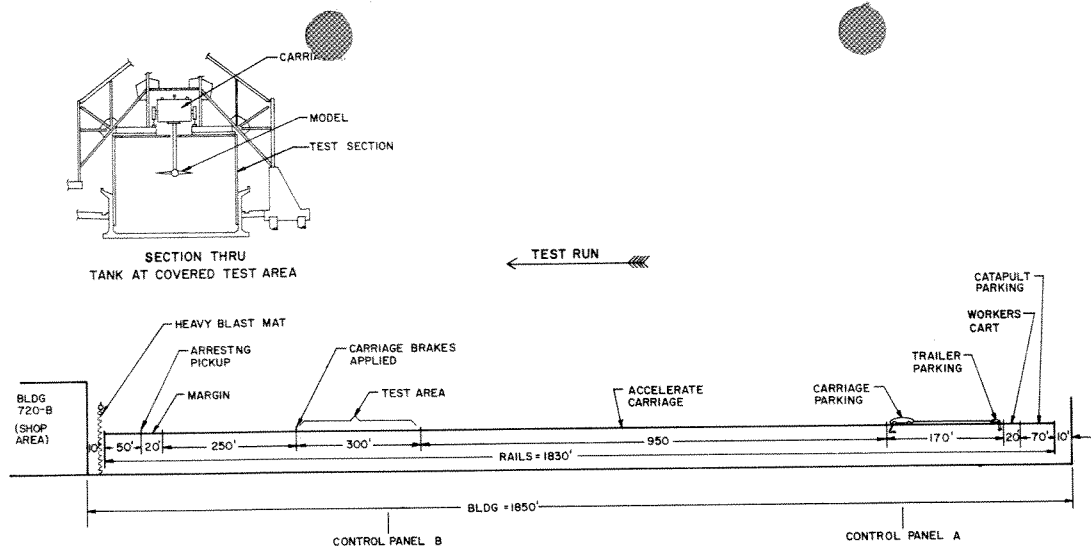
PLANS

OTHER INFO SOURCES

COGNIZANT ORG. High-Speed Aircraft Division
COMPONENT

LOCAL CONTACT FOR FURTHER INFO Chief, Research Facilities Engineering Division, Code 56.000; (804) 827-3171

January 1974



DESCRIPTION

This research facility is unique in that the model aircraft is moved through stationary air rather than being held stationary while air is forced over the model as is usually the case in wind tunnels. As a result of this arrangement, it is possible to visually examine the motion of the vortex after the model has passed as well as to determine the vortex velocities from the moment of development to the point of complete decay. The rolling moment induced by the vortex on a following aircraft is measured by a model trailed at various scale distances behind the generating aircraft.

The vortex generating model is blade mounted below a streamlined carriage which attains a velocity of 100 ft/sec along the 1800-ft overhead track located in the Langley towing tank. Forces and moments are measured by an internal, 6-component strain gage force balance and recorded on board by a 14-channel tape recorder. High-pressure air carried on the carriage is used in simulating engine thrust on the generating model.

The following model is mounted on a strain gage roll balance which is supported by the last of 10 trailers which follow in train fashion, to obtain a scale distance of one mile behind the generating model. It is possible to move the following model 2 dimensionally in a plane perpendicular to the motion of the model to insure penetration of the vortex regardless of its position.