

APPENDIX B

533.6 AERODYNAMICS

- 533.6 Aerodynamics
- Special analytical subdivisions
- .01 subdivisions may be used throughout 533.6
 - .03/.04 " are only applicable to 533.69
 - .01/.04 " may be used as main numbers where no other number has been allocated
 - .05/.08 " should be used as main numbers
- It is undesirable that one analytical number should be added to another.
- 533.6.011 Motion of and in gases. Flow.
- .011.1 Theory of dimensions
 - .011.12 Reynolds number effect. Scale effect.
 - .011.32 Flow at subsonic velocities - without compressibility effect
 - .011.34 " " " " - with compressibility effect
 - .011.35 " " transonic "
 - .011.5 " " supersonic "
 - .011.55 " " hypersonic " (Mach 5 and above)
 - .011.6 Heat transfer phenomena of moving bodies and gases (To include all problems of aerodynamics with heat, including cooling. See 532.546 for flow of liquids through porous media)
 - .011.72 Shock waves. Shock wave configuration.
 - .011.8 Super aerodynamics. Flow in rarefied gases.
- .013 Dynamics of aeronautical machines
- .013.1 Forces and moments
 - .013.12 Drag (Cooling, induced, pressure, form, surface friction, base drag)
 - .013.122 Drag reduction. Area rule
 - .013.13 Lift. Normal force
 - .013.14 Lateral force. Side force
 - .013.15 Pitching moment
 - .013.16 Rolling "
 - .013.17 Yawing "
 - .013.18 Hinge "

Appendix B (Continued)

533.6.013.2	Unsteady motion
.013.4	Stability (Papers dealing with stability and control in general go here)
.013.412	Longitudinal stability
.013.413	Lateral "
.013.415	Directional "
.013.417	Stability derivatives
.013.418	Cross coupling. Inertia coupling
.013.42	Aeroelasticity
.013.422	Flutter
.013.423	Damping. Balances. Mass balances
.013.424	Divergence. Increased oscillation
.013.425	Effect on controls (Control reversal and loss of control effectiveness)
.013.43	Buffeting
.013.47	Aircraft response
.013.6	Conditions of flight
.013.63	Turning flight
.013.65	Manoeuvring flight
.013.66	Stalling
.013.67	Hovering. Low speed flight
.013.68	Non-powered flight
.013.682	Gliding "
.013.685	Towed "
.013.686	Parasitic "
.013.7	Spinning
.015	Performance
.015.1	Take-off
.015.2	Approach and landing
.015.3	Speed. Rate of ascent. Rate of descent
.015.32	Speed
.015.34	Rate of ascent and descent
.015.342	Rate of ascent. Climbing
.015.343	Rate of descent. Diving
.015.5	High altitude
.015.7	Duration and distance
.015.72	Duration
.015.74	Range. Radius of action. Air miles per gallon
.015.8	Prediction of performance. Reduction to standard atmospheric conditions

Appendix B (Continued)

- 533.6.031 Aspect ratio
- .032 Camber
- .033 Taper and twist
- .034 Thickness distribution
- .035 Dihedral
- .036 Surface conditions
- .037 Fineness ratio

- .048 Airflow variables
- .048.1 Aerodynamic loading
- .048.2 Pressure distribution
- .048.3 Downwash. Wakes
- .048.5 Gust loads. Acceleration stresses. Vg tests

- 533.6.05 Flight testing techniques
(for flow visualisation methods see 533.6.071.31)

- .053 Full scale. Piloted
- .055 Model. Pilotless

- 533.6.07 Ground testing techniques. Wind tunnels, water tunnels, etc.
- .071 Wind tunnels
May be divided alphabetically by type if required.
e.g. Blowdown.
Use only for descriptions of testing plants, equipment and techniques. Reports on tests in wind tunnels, etc. go under the configuration tested with the addition of .001.5 if desired.
- .071.1 Construction. Working section. Vanes. Cascades. Diffusers. Bulges. Contractions. Screens. Nozzles. Wave makers.
- .071.11 Walls - slotted, porous, flexible
- .071.2 Power plant
- .071.3 Apparatus
- .071.31 Visualisation methods
- .071.32 Balances. Model mountings. Stings
- .071.33 Models
(For other instruments use existing U.D.C. number coloned to 533.6.071.3 e.g. Manometers 533.6.071.3 :531.787)

Appendix B (Continued)

- 533.6.071.4 Flow problems. Interference. Turbulence.
 Calibration. Corrections. Scale effect. Use
 of gases other than air.
- .071.5 Tunnel conditions. Ventilation. Noise. Temperature.
 Humidity. Pressure, etc.
- .072 Spinning tunnels
- .073 Shock tubes
- .074 Water tanks. Water tunnels
- .075 Apparatus with rotating devices
- .075.2 Whirling arms
- .075.5 Propeller and rotor testing plant
- .076 Analogies. Tanks for solving potential flow problems
- .077 Ballistic ranges, etc.
- .078 High speed railways. Sleds.

Note: The divisions .072/.078 may be subdivided as
.071. For different types of wind tunnels use
subdivisions of 533.6 e.g. Supersonic tunnels
533.6.071.011.5

- 533.6.08 Flow measurement
- Divide as 53.08 e.g. :-
- .082.3 Use of aerodynamic and aerostatic phenomena
 (i.e. measurement in pressure head, static
 head or vent, trailing static, air log etc.)
- .082.7 Use of electrical phenomena
 (i.e. hot wire anemometers)
- .088 Accuracy. Errors. Correction
 (e.g. Position error)
- .089 Calibration
 (For meteorological anemometers see 551.508.2
 " airspeed indicators see 629.13.053.2
 " fluid flow measurement 532.57)

- 533.61 Lighter-than-air-machines
- .62 Free balloons
- .63 Captive balloons
- .64 Dirigible balloons. Airships
- .65 Aeroplanes
- .652 Landplanes

Appendix B (Continued)

- 533.652.1 Monoplanes
- .652.2 Biplanes
- .652.3 Multiplanes
- .652.5 All wing aircraft
- .652.6 V. T. O. L. , S. T. O. L. , Convertiplanes. (Not rotorcraft)

- .652.9 Other types including Canard
- .655 Seaplanes
- .655.2 Float seaplanes (subdivide as 533.652)
- .655.3 Boat " " "
- .655.4 Ski " " "
- .657 Amphibians

- .655/7 may be subdivided as .652 if required
- e. g. 533.655.35 all wing boat seaplanes

- 533.66 Theory of other flying machines
- .661 Helicopters
- .661.2 Autogyros
- .662 Airscrews
- .662.2 Propellers
- .662.21 Single propellers
- .662.22 Co-axial, contra rotating. Tandem propellers
- .662.3 Fans. Ducted fans
- .662.6 Lifting airscrews. Helicopter rotors
- .662.62 Axially driven
- .662.63 Circumferentially driven. Jet driven rotors
- .662.64 Autorotating. Driven by the relative wind
- .662.7 Windmills
- .663 Cyclogyros
- .664 Ornithopters. Aircraft with moving wings. (except rotorcraft)
- .665 Missiles
- .666 Machines for nonpowered flight
- .666.2 Parachutes
- .666.4 Kites
- .666.6 Gliders

- 533.68 Aerodynamic study of bodies moving on or near the ground,
 deck or water
- .682 Ground. Taxying. Forced landing. Ground effect

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533.683	Deck
.685	Water. Ditching
533.69	Aerodynamics of aircraft elements The following analytical subdivisions are particularly applicable here.
533.69.001.1	Theory
.001.5	Experiment
.031	Aspect ratio
.032	Camber
.033	Taper and twist
.034	Thickness distribution
.035	Dihedral
.036	Surface conditions
.037	Fineness ratio
.048	Airflow variables
.048.1	Aerodynamic loading
.048.2	Pressure distribution
.048.3	Downwash, wakes
.048.5	Gust loads. Acceleration stresses. Vg tests
533.692	Wing sections
.1	Designated
.2	Diamond and hexagonal
.3	Biconvex and circular arc
.4	Flat plate
.5	Wedges
.6	Section varying along span
533.693	Complete wings
.1	Swept) Use only when planforms below are not
.2	Unswept) the subject of the report
.3	Delta. Double delta. Diamond. Arrowhead
.4	Sweep varying along the span. Crescent. Cranked. M & W.
.5	Elliptic. Circular
.6	Rectangular
.7	Trapezoidal
.8	Ring wings
.9	Other e.g. aeroisoclinic, cruciform

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533.694	High lift devices. Controls
.2	Flaps. Slats. Slots
.21	Split
.22	Slotted
.23	Dive flaps. Brakes
.25	Leading edge flaps. Chord extensions. Drooped Leading edge
.26	Slats
533.694.5	Control surfaces
.51	Lateral controls
.511	Ailerons, trailing edge
.512	" moving wing tip
.513	Other types. Spoilers
.52	Elevons
.53	Longitudinal controls
.531	Fixed tail plane
.532	All moving tail plane
.533	Elevators
.54	Directional controls
.541	Fins
.542	Rudder
.58	Tabs
.6	Jets used as high lift devices or controls (If the jets are used purely as boundary layer control devices they should be classified at 533.694.72)
.7	Boundary layer control
.71	Suction
.72	Blowing
.73	Fences. Vortex generators. End plates
533.695	Components in combination (For interference between aircraft and ground or water see 533.682) For interference between parts of an aircraft, combine the following as appropriate in ascending numerical order, e. g. interference between propeller and tailplane 533.695.45, interference between wing and tailplane 533.695.14

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- 533.695.1 Wing
- .2 Body
- .3 Nacelle
- .4 Tail, vertical and horizontal
- .5 Propeller, rotor
- .6 External stores, drop tanks, pods, weapons carried externally, landing gear.
- .7 Jet or exhaust
- .8 Cascades. Multiplanes
- .9 Protuberances. Recesses. Doors. Bays (for dropping, landing gear retraction, etc.)

- 533.696 Bodies
- .2 Spheres
- .3 Cylinders
- .4 Cones
- .5 Other circular cross section. Bodies of revolution
- .6 Non-circular cross section
- .7 Designated bodies

- 533.697 Internal aerodynamics
(For energy losses, colon appropriate subdivisions of 532.55 to appropriate subdivision of 533.697)
- .2 Intakes
- .23 Nose intakes
- .24 Side "
- .242 Scoops
- .244 Submerged
- .25 Wing leading edge intakes
- .3 Ducts. Passages. Bends. Diffusers
(See also 533.6.071,1 for wind tunnel diffusers)
- .4 Nozzles. Jets
(See also 533.6.071.1 for wind tunnel nozzles)
- .5 Ejectors. Jet pumps. Outlets. Bleeds
- .6 Bodies in ducts
(See 533.662.3 for ducted fans)

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629.13.012.531	Cabins. Aircraft structures.
629.13.012.59	Cabins, pressurised. Aircraft structures.
621.315.2	Cables. Electrical engineering.
629.13.014.5- 427.4	Cables. Flying controls. Aircraft engineering.
624.071.2	Cables. Structural elements. Civil engineering.
621.315.212	Cables, coaxial. Electrical engineering.
669.73	Cadmium. Metallurgy.
621.822.722	Cages. Ball bearings. Power transmission. Mechanical engineering.
621.822.822	Cages. Roller bearings. Power transmission. Mechanical engineering.
624.042	Calculation. Loads. Structures. Civil engineering.
518	Calculation. Mathematics.
518.4	Calculation, graphical. Mathematics.
518.12	Calculation, numerical. Mathematics.
517.3	Calculus, integral. Analysis. Mathematics.
519.21	Calculus of probability. Mathematics.
519.3	Calculus of variations. Mathematics.
533.6.071.43	Calibration. Flow problems. Wind tunnels.
53.089.6	Calibration. Principles of measurement. Physics.
536.6	Calorimetry. Heat. Physics.
533.69.032	Camber. Aircraft elements. Aerodynamics.
533.692.032	Cambered aerofoil sections. Aerodynamics.
771.3	Cameras. Photography.
621.397.3	Cameras, television. Television. Electrical engineering.
621.835	Cams. Power transmission. Mechanical engineering.
621.835.001.1	Cams. Power transmission. Mechanical engineering. <u>Design.</u>
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533.652.9	Canards. Aerodynamics.
629.13.012.134.4	Canopies, aircraft. Aircraft structures.
533.695.9	Canopies, aircraft. Interference. Aerodynamics.
532.6	Capillarity. Mechanics of fluids. Physics.
621-415	Cantilever plates. Thin plates. Materials shapes. Mechanical engineering.

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621.319.4	Capacitors. Electrical engineering.
532.66	Capillary tubes. Capillarity. Mechanics, of fluids. Physics.
629.13.012.217	Capsules, escape. Aircraft structures.
546.261	Carbides. Carbon. Inorganic chemistry.
661.665	Carbides. Chemical technology.
546.26	Carbon. Inorganic chemistry.
621.3.047.43	Carbon brushes. Current collection. Electrical engineering.
621.43.019.942	Carbon deposits. Combustion problems. Internal combustion engines.
661.97	Carbon dioxide. Chemical technology.
661.993	Carbon monoxide. Chemical technology.
546.262.3	Carbon monoxide. Inorganic chemistry.
547.58	Carboxylic acids, aromatic. Organic chemistry.
547.46	Carboxylic acids, polybasic. Organic chemistry.
621.785.51	Carburising, case. Heat treatment. Workshop practice.
621.785.52	Carburising, pack. Heat treatment. Workshop practice.
629.138.4	Cargo aircraft. Aircraft engineering.
629.13.071.55	Cargo weight. Aircraft engineering.
621.394.441	Carrier waves. Telegraphy. Electrical engineering.
623.822.7	Carriers, aircraft. Warships. Naval engineering.
533.695.8	Cascades. Interference. Aerodynamics.
621.785.51	Case carburising. Heat treatment. Workshop practice.
621.785.5	Case hardening. Heat treatment. Workshop practice.
669.14.018.462	Case hardening, steel. Metallurgy.
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669.14-14	Cast steel. Metallurgy.
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