

B64 AIRCRAFT; AVIATION; COSMONAUTICS**B64C AEROPLANES; HELICOPTERS** (air-cushion vehicles B60V)

As far as possible, classification is made according to constructional features; classification according to particular kinds of aircraft is normally regarded as being of secondary importance, except in cases where this is considered to be the characteristic feature. [3]

STRUCTURES, FAIRINGS

Features common to different elements	1/00
Fuselages; wings; stabilising surfaces	1/00; 3/00; 5/00
Other structural elements.....	7/00

PROPELLERS, FLIGHT CONTROL

Propellers	11/00
Adjustable control surfaces or members; control systems	9/00; 13/00
Control by jet reaction	15/00
Stabilisation and controls not otherwise provided for.....	17/00, 19/00

MODIFYING LIFT BY ACTION ON AIR-

FLOW	13/00, 21/00, 23/00
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ALIGHTING GEAR25/00**AIRCRAFT KINDS AND THEIR COMPONENTS NOT OTHERWISE PROVIDED FOR**

Supersonic	30/00
Seaplanes	35/00
Aircraft intended to be sustained without power plant; powered hand-glider-type aircraft; microlight aircraft	31/00
Convertible aircraft	37/00
Vertical-take-off or landing aircraft	29/00
Rotorcraft; ornithopters.....	27/00; 33/00
Others	39/00

Aircraft structures or fairings (boundary-layer controls B64C 21/00)**1/00 Fuselages; Constructional features common to fuselages, wings, stabilising surfaces, or the like**

(aerodynamical features common to fuselages, wings, stabilising surfaces, or the like B64C 23/00; flight-deck installations B64D)

1/06	. Frames; Stringers; Longerons
1/08	. . Geodetic or other open-frame structures
1/10	. . Bulkheads
1/12	. . Construction or attachment of skin panels
1/14	. Windows; Doors; Hatch covers or access panels; Surrounding frame structures; Canopies; Windscreens (fairings movable in conjunction with undercarriage elements B64C 25/16; bomb doors B64D 1/06)
1/16	. specially adapted for mounting power plant
1/18	. Floors
1/20	. . specially adapted for freight
1/22	. Other structures integral with fuselages to facilitate loading
1/24	. Steps mounted on, and retractable within, fuselages (readily removable B64D 9/00)
1/26	. Attaching the wing or tail units or stabilising surfaces
1/28	. Parts of fuselage relatively movable to improve pilots view
1/30	. Parts of fuselage relatively movable to reduce overall dimensions of aircraft
1/32	. Severable or jettisonable parts of fuselage facilitating emergency escape (ejector seats B64D 25/10)
1/34	. comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C 29/00)

1/36	. adapted to receive aerals or radomes (aerals or radomes <u>per se</u> H01Q)
1/38	. Constructions adapted to reduce effects of aerodynamic or other external heating
1/40	. Sound or heat insulation
3/00	Wings (stabilising surfaces B64C 5/00; ornithopter wings B64C 33/02)
3/10	. Shape of wings
3/14	. . Aerofoil profile
3/16	. . Frontal aspect
3/18	. Spars; Ribs; Stringers (attaching wing unit to fuselage B64C 1/26)
3/20	. Integral or sandwich constructions (layered products or sandwich constructions in general B32B)
3/22	. Geodetic or other open-frame structures
3/24	. Moulded or cast structures
3/26	. Construction, shape, or attachment of separate skins, e.g. panels
3/28	. Leading or trailing edges attached to primary structures, e.g. forming fixed slots
3/30	. comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C 29/00)
3/32	. specially adapted for mounting power plant
3/34	. Integrally-constructed tanks, e.g. for fuel (other aircraft fuel tanks or fuel systems B64D)
3/36	. Structures adapted to reduce effects of aerodynamic or other external heating
3/38	. Adjustment of complete wings or parts thereof
3/40	. . Varying angle of sweep
3/42	. . Adjusting about chordwise axes
3/44	. . Varying camber

3/46	. . . by inflatable elements (connection of valves to inflatable elastic bodies B60C 29/00)	11/10	 rigid
3/48	. . . by relatively-movable parts of wing structures	11/12	 flexible
3/50	. . . by leading or trailing edge flaps (ailerons B64C 9/00)	11/14	. . Spinners
3/52	. . Warping	11/16	. Blades
3/54	. . Varying in area (flaps extendable to increase camber B64C 3/44)	11/18	. . Aerodynamic features
3/56	. . Folding or collapsing to reduce overall dimensions of aircraft	11/20	. . Constructional features
3/58	. provided with fences or spoilers (adjustable for control purposes B64C 9/00)	11/22	. . . Solid blades
5/00	Stabilising surfaces (attaching stabilising surfaces to fuselage B64C 1/26)	11/24	. . . Hollow blades
5/02	. Tailplanes (fins B64C 5/06)	11/26	. . . Fabricated blades
5/04	. Noseplanes	11/28	. . . Collapsible or foldable blades
5/06	. Fins (specially for wings B64C 5/08)	11/30	. Blade pitch-changing mechanisms
5/08	. mounted on, or supported by, wings	11/32	. . mechanical
5/10	. adjustable	11/34	. . . automatic
5/12	. . for retraction against or within fuselage or nacelle	11/36	. . . non-automatic
5/14	. . Varying angle of sweep	11/38	. . fluid, e.g. hydraulic
5/16	. . about spanwise axes	11/40	. . . automatic
5/18	. . in area	11/42	. . . non-automatic
7/00	Structures or fairings not otherwise provided for	11/44	. . electric
7/02	. Nacelles	11/46	. Arrangements of, or constructional features peculiar to, multiple propellers
9/00	Adjustable control surfaces or members, e.g. rudders (trimming stabilising surfaces B64C 5/10; systems for actuating flying-control surfaces B64C 13/00)	11/48	. . Units of two or more coaxial propellers
9/02	. Mounting or supporting thereof	11/50	. . Phase synchronisation between multiple propellers
9/04	. with compound dependent movements	13/00	Control systems or transmitting systems for actuating flying-control surfaces, lift-increasing flaps, air brakes, or spoilers
9/06	. with two or more independent movements	13/02	. Initiating means
9/08	. bodily displaceable (varying camber of wings B64C 3/44)	13/04	. . actuated personally
9/10	. one surface adjusted by movement of another, e.g. servo tabs (B64C 9/04 takes precedence; adjusting surfaces of different type or function B64C 9/12)	13/06	. . . adjustable to suit individual persons
9/12	. surfaces of different type or function being simultaneously adjusted	13/08	. . . Trimming zero positions
9/14	. forming slots (boundary-layer control B64C 21/00)	13/10	. . . comprising warning devices
9/16	. . at the rear of the wing	13/12	. . . Dual control apparatus
9/18	. . . by single flaps	13/14	. . . lockable (locking in position to suit individual persons B64C 13/06)
9/20	. . . by multiple flaps	13/16	. . actuated automatically, e.g. responsive to gust detectors
9/22	. . at the front of the wing	13/18	. . . using automatic pilot (automatic pilots <u>per se</u> G05D 1/00)
9/24	. . . by single flap	13/20	. . . using radiated signals
9/26	. . . by multiple flaps	13/22	. . . readily revertible to personal control
9/28	. . by flaps at both the front and rear of the wing operating in unison	13/24	. Transmitting means
9/30	. Balancing hinged surfaces, e.g. dynamically	13/26	. . without power amplification or where power amplification is irrelevant
9/32	. Air braking surfaces (braking by parachutes B64D 17/80)	13/28	. . . mechanical
9/34	. collapsing or retracting against or within other surfaces or other members	13/30	 using cable, chain, or rod mechanisms
9/36	. . the members being fuselages or nacelles	13/32	 using cam mechanisms
9/38	. Jet flaps	13/34	 using toothed gearing
11/00	Propellers, e.g. of ducted type; Features common to propellers and rotors for rotorcraft (rotors specially adapted for rotorcraft B64C 27/32)	13/36	. . . fluid
11/02	. Hub construction	13/38	. . with power amplification
11/04	. . Blade mountings	13/40	. . . using fluid pressure
11/06	. . . for variable-pitch blades	13/42	 having duplication or stand-by provisions
11/08	. . . for non-adjustable blades	13/44	 overriding of personal controls; with automatic return to inoperative position
		13/46	 with artificial feel
		13/48	 characterised by the fluid being gaseous
		13/50	 using electrical energy
		15/00	Attitude, flight direction, or altitude control by jet reaction (details of jet-engine plants, e.g. of nozzles or jet pipes, F02K) [3]
		15/02	. the jets being propulsion jets
		15/12	. . the power plant being tilttable
		15/14	. the jets being other than main propulsion jets (jet flaps B64C 9/38)

- 17/00 Aircraft stabilisation not otherwise provided for**
 17/02 . by gravity or inertia-actuated apparatus
 17/04 . . by pendular bodies
 17/06 . . by gyroscopic apparatus (automatic-pilot control B64C 13/18)
 17/08 . by ballast supply or discharge (for lighter-than-air aircraft B64B)
 17/10 . Transferring fuel to adjust trim
- 19/00 Aircraft control not otherwise provided for**
 19/02 . Conjoint controls

Influencing air-flow over aircraft surfaces, not otherwise provided for

- 21/00 Influencing air-flow over aircraft surfaces by affecting boundary-layer flow** (boundary-layer control in general F15D)
 21/02 . by use of slot, ducts, porous areas, or the like
 21/04 . . for blowing (B64C 21/08 takes precedence)
 21/06 . . for sucking (B64C 21/08 takes precedence)
 21/08 . . adjustable
 21/10 . using other surface properties, e.g. roughness
- 23/00 Influencing air-flow over aircraft surfaces, not otherwise provided for**
 23/02 . by means of rotating members of cylindrical or similar form
 23/04 . by generating shock waves
 23/06 . by generating vortices
 23/08 . using Magnus effect
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- 25/00 Alighting gear** (air-cushion alighting gear B60V 3/08)
 25/02 . Undercarriages
 25/04 . . Arrangement or disposition on aircraft
 25/06 . . fixed
 25/08 . . non-fixed, e.g. jettisonable
 25/10 . . . retractable, foldable, or the like
 25/12 sideways
 25/14 fore-and-aft
 25/16 Fairings movable in conjunction with undercarriage elements
 25/18 Operating mechanisms
 25/20 mechanical
 25/22 fluid
 25/24 electric
 25/26 Control or locking systems therefor
 25/28 with indicating or warning devices
 25/30 emergency actuated
 25/32 . characterised by elements which contact the ground or similar surface (arrestor hooks B64C 25/68)
 25/34 . . wheeled type, e.g. multi-wheeled bogies
 25/36 . . . Arrangements or adaptations of wheels, tyres, or axles in general (construction of wheels or axles B60B; construction of tyres in general B60C)
 25/38 . . endless-track type
 25/40 . . the elements being rotated before touch-down
 25/42 . . Arrangement or adaptation of brakes (the ground braking force being regulated, at least in part, by a speed condition, e.g. acceleration or deceleration of the ground engaging alighting gear, B60T 8/32) [4]
 25/44 . . . Actuating mechanisms
 25/46 Brake regulators for preventing skidding or aircraft somersaulting

- 25/48 differentially operated for steering purposes
 25/50 . . Steerable undercarriages; Shimmy-damping (steering devices applicable to land vehicles B62D)
 25/52 . . Skis or runners
 25/54 . . Floats
 25/56 . . . inflatable (connection of valves to inflatable elastic bodies B60C 29/00)
 25/58 . . Arrangements or adaptations of shock-absorbers or springs (shimmy-dampers B64C 25/50; vehicle suspension arrangements in general B60G; shock-absorbers *per se* F16F)
 25/60 . . . Oleo legs
 25/62 . . . Spring shock-absorbers; Springs
 25/64 using rubber or like elements
 25/66 . . Convertible alighting gear; Combinations of different kinds of ground or like engaging elements
 25/68 . Arrestor hooks (arresting gear, e.g. on aircraft carriers, B64F)

Aircraft kinds or components not otherwise provided for

- 27/00 Rotorcraft; Rotors peculiar thereto** (alighting gear B64C 25/00)
 27/02 . Gyroplanes
 27/04 . Helicopters
 27/06 . . with single rotor
 27/08 . . with two or more rotors
 27/10 . . . arranged coaxially
 27/12 . . Rotor drives
 27/14 . . . Direct drive between power plant and rotor hub
 27/16 . . . Drive of rotors by means, e.g. propellers, mounted on rotor blades
 27/18 the means being jet-reaction apparatus
 27/20 . Rotorcraft characterised by having shrouded rotors, e.g. flying platforms
 27/22 . Compound rotorcraft, i.e. aircraft using in flight the features of both aeroplane and rotorcraft
 27/24 . . with rotor blades fixed in flight to act as lifting surfaces
 27/26 . . characterised by provision of fixed wings
 27/28 . . with forward-propulsion propellers pivotable to act as lifting rotors
 27/30 . . with provision for reducing drag of inoperative rotor
 27/32 . Rotors (features common to rotors and propellers B64C 11/00)
 27/33 . . having flexing arms [3]
 27/35 . . having elastomeric joints [3]
 27/37 . . having articulated joints (B64C 27/33, B64C 27/35 take precedence) [3]
 27/39 . . . with individually articulated blades, i.e. with flapping or drag hinges [3]
 27/41 . . . with flapping hinge or universal joint, common to the blades [3]
 27/43 see-saw type, i.e. two-bladed rotor [3]
 27/45 . . . with a feathering hinge only [3]
 27/46 . . Blades
 27/467 . . . Aerodynamic features [6]
 27/473 . . . Constructional features [6]
 27/48 Root attachment to rotor head
 27/50 Blades foldable to facilitate stowage of aircraft
 27/51 . Damping of blade movements [3]

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- 27/52 . Tilting of rotor bodily relative to fuselage (of see-saw type construction B64C 27/43)
- 27/54 . Mechanisms for controlling blade adjustment or movement relative to rotor head, e.g. lag-lead movement
- 27/56 . . characterised by the control initiating means, e.g. manually actuated (B64C 27/58 takes precedence)
- 27/57 . . . automatic or condition responsive, e.g. responsive to rotor speed, torque or thrust [3]
- 27/58 . . Transmitting means, e.g. interrelated with initiating means or means acting on blades (initiating means B64C 27/56; means acting on blades B64C 27/72)
- 27/59 . . . mechanical [3]
- 27/605 including swash plate, spider or cam mechanisms [3]
- 27/615 including flaps mounted on blades [3]
- 27/625 including rotating masses or servo rotors [3]
- 27/635 specially for controlling lag-lead movements of blades [3]
- 27/64 . . . using fluid pressure, e.g. having fluid power amplification [3]
- 27/68 . . . using electrical energy, e.g. having electrical power amplification [3]
- 27/72 . . Means acting on blades
- 27/78 . . in association with pitch adjustment of blades of anti-torque rotor
- 27/80 . . for differential adjustment of blade pitch between two or more lifting rotors
- 27/82 . characterised by the provision of an auxiliary rotor or fluid-jet device for counter-balancing lifting-rotor torque or changing direction of rotorcraft

- 29/00 **Aircraft capable of landing or taking-off vertically** (attitude, flight direction, or altitude control by jet reaction B64C 15/00; rotorcraft B64C 27/00; air-cushion vehicles B60V; details of jet-engine plants, e.g. of nozzles or jet pipes, F02K)
- 29/02 . having its flight directional axis vertical when grounded
- 29/04 . . characterised by jet-reaction propulsion
- 30/00 **Supersonic type aircraft [3]**
- 31/00 **Aircraft intended to be sustained without power plant; Powered hang-glider-type aircraft; Microlight-type aircraft**
- 31/02 . Gliders, e.g. sailplanes (hang-gliders B64C 31/028) [6]
- 31/024 . . with auxiliary power plant [6]
- 31/028 . Hang-glider-type aircraft; Microlight-type aircraft [6]
- 31/032 . . having delta shaped wing [6]
- 31/036 . . having parachute-type wing (parachutes B64D 17/00) [6]
- 31/04 . Man-powered aircraft (ornithopters B64C 33/00)
- 31/06 . Kites (hang-gliders B64C 31/028; toy aspects A63H 27/08; towed targets F41J)
- 33/00 **Ornithopters**
- 33/02 . Wings; Actuating mechanisms therefor
- 35/00 **Flying-boats; Seaplanes** (alighting gear B64C 25/00)
- 35/02 . Flying-boat hulls [3]
- 37/00 **Convertible aircraft** (vehicles capable of travelling in or on different media B60F)
- 37/02 . Flying units formed by separate aircraft (towing, air-refuelling, or aircraft-carrying aircraft B64D)
- 39/00 **Aircraft not otherwise provided for**
- 39/02 . characterised by special use
- 39/04 . having multiple fuselages or tail booms [3]
- 39/06 . having disc- or ring-shaped wings [3]
- 39/08 . having multiple wings [3]
- 39/10 . All-wing aircraft [3]
- 39/12 . Canard-type aircraft [3]