

# CPC COOPERATIVE PATENT CLASSIFICATION

## H ELECTRICITY

(NOTE omitted)

### H01 ELECTRIC ELEMENTS

(NOTES omitted)

#### H01Q ANTENNAS, i.e. RADIO AERIALS (radiators or antennas for microwave heating [H05B 6/72](#))

##### NOTES

- This subclass covers:
  - in addition to the primary active radiating elements,
    - secondary devices for absorbing or for modifying the direction or polarisation of waves radiated from antennas, and
    - combinations with auxiliary devices such as earthing switches, lead-in devices, and lightning protectors;
  - both transmitting and receiving antennas.
- This subclass does not cover devices of the waveguide type, such as resonators or lines, not designed as radiating elements, which are covered by subclass [H01P](#).
- In this subclass, the following expression is used with the meaning indicated:
  - "active radiating element" covers corresponding parts of a receiving antenna.

##### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00	<b>Details of, or arrangements associated with, antennas</b> (arrangements for varying orientation of directional pattern <a href="#">H01Q 3/00</a> )	1/087 1/088 1/10 1/103 1/106 1/12 1/1207 1/1214 1/1221 1/1228 1/1235	. . . {Extensible roll- up aerials} . . {Quick-releasable antenna elements} . . Telescopic elements . . . {Latching means; ensuring extension or retraction thereof} . . . {Means for locking or protecting against unauthorized extraction} . Supports; Mounting means . {for fastening a rigid aerial element} . . . {through a wall} . . . {onto a wall} . . . {on a boom} . {Collapsible supports; Means for erecting a rigid antenna}
<b>NOTES</b>			
1/002	. {Protection against seismic waves, thermal radiation or other disturbances, e.g. nuclear explosion; Arrangements for improving the power handling capability of an antenna}	1/1242	. . {Rigid masts specially adapted for supporting an aerial}
1/005	. {Damping of vibrations; Means for reducing wind-induced forces}	1/125 1/1257 1/1264	. . {Means for positioning} . . . {using the received signal strength} . . . {Adjusting different parts or elements of an aerial unit}
1/007	. {specially adapted for indoor communication}	1/1271	. . {for mounting on windscreens}
1/02	. Arrangements for de-icing; Arrangements for drying-out {; Arrangements for cooling; Arrangements for preventing corrosion}	1/1278 1/1285	. . . {in association with heating wires or layers} . . . {with capacitive feeding through the windscreen}
1/04	. Adaptation for subterranean or subaqueous use	1/1292	. . {for mounting on balloons}
1/06	. Means for the lighting or illuminating of antennas, e.g. for purpose of warning	1/14 1/16	. . for wire or other non-rigid radiating elements . . . Strainers, spreaders, or spacers
1/08	. Means for collapsing antennas or parts thereof (collapsible loop antennas <a href="#">H01Q 7/02</a> ; means for collapsing H-antennas or Yagi antennas <a href="#">H01Q 19/04</a> )	1/18 1/185	. . Means for stabilising antennas on an unstable platform . . . {by electronic means}
1/081	. . {Inflatable antennas}	1/20	. . Resilient mountings
1/082	. . . {Balloon antennas}	1/22	. . by structural association with other equipment or articles
1/084	. . {Pivotable antennas}		
1/085	. . {Flexible aerials; Whip aerials with a resilient base}		

- 1/2208 . . . {associated with components used in interrogation type services, i.e. in systems for information exchange between an interrogator/reader and a tag/transponder, e.g. in Radio Frequency Identification [RFID] systems (methods or arrangements for sensing record carriers, e.g. for reading patterns [G06K 7/00](#); record carrier for use with machines and with at least a part designed to carry digital markings [G06K 19/00](#))}
- 1/2216 . . . . {used in interrogator/reader equipment}
- 1/2225 . . . . {used in active tags, i.e. provided with its own power source or in passive tags, i.e. deriving power from RF signal}
- 1/2233 . . . . {used in consumption-meter devices, e.g. electricity, gas or water meters}
- 1/2241 . . . . {used in or for vehicle tyres}
- 1/225 . . . {used in level-measurement devices, e.g. for level gauge measurement}
- 1/2258 . . . {used with computer equipment}
- 1/2266 . . . . {disposed inside the computer}
- 1/2275 . . . . {associated to expansion card or bus, e.g. in PCMCIA, PC cards, Wireless USB}
- 1/2283 . . . {mounted in or on the surface of a semiconductor substrate as a chip-type antenna or integrated with other components into an IC package}
- 1/2291 . . . {used in bluetooth or WI-FI devices of Wireless Local Area Networks [WLAN] ([H01Q 1/241](#) takes precedence; WLAN in general [H04W](#))}
- 1/24 . . . . with receiving set
- 1/241 . . . . {used in mobile communications, e.g. GSM ([H01Q 1/247](#), [H01Q 1/248](#) take precedence)}
- 1/242 . . . . . {specially adapted for hand-held use}
- 1/243 . . . . . {with built-in antennas}
- 1/244 . . . . . {extendable from a housing along a given path}
- 1/245 . . . . . {with means for shaping the antenna pattern, e.g. in order to protect user against rf exposure}
- 1/246 . . . . . {specially adapted for base stations}
- 1/247 . . . . {with frequency mixer, e.g. for direct satellite reception or Doppler radar}
- 1/248 . . . . {provided with an AC/DC converting device, e.g. rectennas}
- 1/26 . . . with electric discharge tube
- 1/27 . . . Adaptation for use in or on movable bodies ([H01Q 1/08](#), [H01Q 1/12](#), [H01Q 1/18](#) take precedence)
- 1/273 . . {Adaptation for carrying or wearing by persons or animals}
- 1/276 . . . {for mounting on helmets}
- 1/28 . . . Adaptation for use in or on aircraft, missiles, satellites, or balloons
- 1/281 . . . {Nose antennas}
- 1/282 . . . {Modifying the aerodynamic properties of the vehicle, e.g. projecting type aerials}
- 1/283 . . . . {Blade, stub antennas}
- 1/285 . . . {Aircraft wire antennas (means for trailing [H01Q 1/30](#))}
- 1/286 . . . {substantially flush mounted with the skin of the craft}
- 1/287 . . . . {integrated in a wing or a stabiliser}
- 1/288 . . . . {Satellite antennas}
- 1/30 . . . . Means for trailing antennas
- 1/32 . . . Adaptation for use in or on road or rail vehicles
- 1/3208 . . . . {characterised by the application wherein the antenna is used}
- 1/3216 . . . . . {where the road or rail vehicle is only used as transportation means}
- 1/3225 . . . . . {Cooperation with the rails or the road}
- 1/3233 . . . . . {particular used as part of a sensor or in a security system, e.g. for automotive radar, navigation systems}
- 1/3241 . . . . . {particular used in keyless entry systems}
- 1/325 . . . . {characterised by the location of the antenna on the vehicle}
- 1/3258 . . . . . {using the gutter of the vehicle; Means for clamping a whip aerial on the edge of a part of the vehicle}
- 1/3266 . . . . . {using the mirror of the vehicle}
- 1/3275 . . . . . {mounted on a horizontal surface of the vehicle, e.g. on roof, hood, trunk}
- 1/3283 . . . . . {side-mounted antennas, e.g. bumper-mounted, door-mounted ([mounted on windscreens \[H01Q 1/1271\]\(#\)](#))}
- 1/3291 . . . . . {mounted in or on other locations inside the vehicle or vehicle body}
- 1/34 . . . Adaptation for use in or on ships, submarines, buoys or torpedoes ([for subaqueous use \[H01Q 1/04\]\(#\)](#))}
- 1/36 . . . Structural form of radiating elements, e.g. cone, spiral, umbrella; {Particular materials used therewith} ([H01Q 1/08](#), [H01Q 1/14](#) take precedence)
- 1/362 . . . {for broadside radiating helical antennas}
- 1/364 . . . {using a particular conducting material, e.g. superconductor}
- 1/366 . . . {using an ionized gas}
- 1/368 . . . {using carbon or carbon composite}
- 1/38 . . . formed by a conductive layer on an insulating support { ([patch antennas \[H01Q 9/0407\]\(#\)](#); [microstrip dipole antennas \[H01Q 9/065\]\(#\)](#); [microstrip slot antennas \[H01Q 13/106\]\(#\)](#); [transmission line microstrip antennas \[H01Q 13/206\]\(#\)](#); [manufacturing reflecting surfaces using insulating material for supporting the reflecting surface \[H01Q 15/142\]\(#\)](#))}
- 1/40 . . . Radiating elements coated with or embedded in protective material
- 1/405 . . . {Radome integrated radiating elements}
- 1/42 . . . Housings not intimately mechanically associated with radiating elements, e.g. radome
- 1/421 . . . {Means for correcting aberrations introduced by a radome}
- 1/422 . . . {comprising two or more layers of dielectric material ([H01Q 1/425](#) takes precedence)}
- 1/424 . . . . {comprising a layer of expanded material}
- 1/425 . . . . {comprising a metallic grid}
- 1/427 . . . . {Flexible radomes}
- 1/428 . . . . {Collapsible radomes; rotatable, tiltable radomes}
- 1/44 . . . using equipment having another main function to serve additionally as an antenna {, e.g. means for giving an antenna an aesthetic aspect} ([H01Q 1/27](#) - [H01Q 1/34](#) take precedence)
- 1/46 . . . Electric supply lines or communication lines
- 1/48 . . . Earthing means; Earth screens; Counterpoises

- 1/50 . . . Structural association of antennas with earthing switches, lead-in devices or lightning protectors
- 1/52 . . . Means for reducing coupling between antennas; Means for reducing coupling between an antenna and another structure ([absorbing means H01Q 17/00](#))
- 1/521 . . . {reducing the coupling between adjacent antennas}
- 1/523 . . . {between antennas of an array}
- 1/525 . . . {between emitting and receiving antennas}
- 1/526 . . . {Electromagnetic shields}
- 1/528 . . . {reducing the re-radiation of a support structure (in a parabolic reflector antenna [H01Q 19/023](#))}
- 3/00 Arrangements for changing or varying the orientation or the shape of the directional pattern of the waves radiated from an antenna or antenna system {(means for positioning [H01Q 1/125](#))}**
- 3/005 . . . {using remotely controlled antenna positioning or scanning}
- 3/01 . . . varying the shape of the antenna or antenna system
- 3/02 . . . using mechanical movement of antenna or antenna system as a whole
- 3/04 . . . for varying one co-ordinate of the orientation
- 3/06 . . . . . over a restricted angle
- 3/08 . . . for varying two co-ordinates of the orientation
- 3/10 . . . . . to produce a conical or spiral scan
- 3/12 . . . using mechanical relative movement between primary active elements and secondary devices of antennas or antenna systems
- 3/14 . . . for varying the relative position of primary active element and a refracting or diffracting device
- 3/16 . . . for varying relative position of primary active element and a reflecting device
- 3/18 . . . . . wherein the primary active element is movable and the reflecting device is fixed
- 3/20 . . . . . wherein the primary active element is fixed and the reflecting device is movable
- 3/22 . . . varying the orientation in accordance with variation of frequency of radiated wave
- 3/24 . . . varying the orientation by switching energy from one active radiating element to another, e.g. for beam switching
- 3/242 . . . {Circumferential scanning}
- 3/245 . . . {in the focal plane of a focussing device}
- 3/247 . . . {by switching different parts of a primary active element}
- 3/26 . . . varying the relative phase or relative amplitude of energisation between two or more active radiating elements; varying the distribution of energy across a radiating aperture ([H01Q 3/12,](#) [H01Q 3/22,](#) [H01Q 3/24 take precedence](#))
- 3/2605 . . . {Array of radiating elements provided with a feedback control over the element weights, e.g. adaptive arrays}
- 3/2611 . . . . . {Means for null steering; Adaptive interference nulling}
- 3/2617 . . . . . {Array of identical elements}
- 3/2623 . . . . . {composed of two antennas}
- 3/2629 . . . . . {Combination of a main antenna unit with an auxiliary antenna unit}
- 3/2635 . . . . . {the auxiliary unit being composed of a plurality of antennas}
- 3/2641 . . . . . {being secondary elements, e.g. reactively steered}
- 3/2647 . . . . . {Retrodirective arrays}
- 3/2652 . . . . . {Self-phasing arrays}
- 3/2658 . . . . . {Phased-array fed focussing structure}
- 3/2664 . . . . . {electrically moving the phase centre of a radiating element in the focal plane of a focussing device (switching [H01Q 3/245,](#) phased-array feeds [H01Q 3/2658](#))}
- 3/267 . . . . . {Phased-array testing or checking devices}
- 3/2676 . . . . . {Optically controlled phased array}
- 3/2682 . . . . . {Time delay steered arrays}
- 3/2688 . . . . . {using acoustic or magnetostatic wave devices}
- 3/2694 . . . . . {using also variable phase-shifters ([H01Q 3/2688 takes precedence](#))}
- 3/28 . . . . . varying the amplitude
- 3/30 . . . . . varying the {relative} phase {between the radiating elements of an array ([H01Q 3/2605,](#) [H01Q 3/2658,](#) [H01Q 3/2682,](#) [H01Q 3/44 take precedence](#))}
- 3/32 . . . . . by mechanical means
- 3/34 . . . . . by electrical means ([active lenses or reflecting arrays H01Q 3/46](#))
- 3/36 . . . . . . . . . with variable phase-shifters
- 3/38 . . . . . . . . . the phase-shifters being digital
- 3/385 . . . . . . . . . {Scan control logics}
- 3/40 . . . . . . . . . with phasing matrix
- 3/42 . . . . . . . . . using frequency-mixing ([H01Q 3/2676 takes precedence](#))}
- 3/44 . . . . . varying the electric or magnetic characteristics of reflecting, refracting, or diffracting devices associated with the radiating element
- 3/443 . . . . . {varying the phase velocity along a leaky transmission line ([frequency scanning H01Q 3/22;](#) [non-resonant leaky-waveguide or transmission-line aerials H01Q 13/20](#))}
- 3/446 . . . . . {the radiating element being at the centre of one or more rings of auxiliary elements}
- 3/46 . . . . . Active lenses or reflecting arrays
- 5/00 Arrangements for simultaneous operation of antennas on two or more different wavebands, e.g. dual-band or multi-band arrangements (combinations of separate active antenna units operating in different wavebands and connected to a common feeder system [H01Q 21/30](#))**
- 5/10 . . . . . Resonant antennas
- 5/15 . . . . . for operation of centre-fed antennas comprising one or more collinear, substantially straight or elongated active elements
- 5/20 . . . . . characterised by the operating wavebands
- 5/22 . . . . . RF wavebands combined with non-RF wavebands, e.g. infrared or optical
- 5/25 . . . . . Ultra-wideband [UWB] systems, e.g. multiple resonance systems; Pulse systems
- 5/28 . . . . . Arrangements for establishing polarisation or beam width over two or more different wavebands
- 5/30 . . . . . Arrangements for providing operation on different wavebands
- 5/307 . . . . . Individual or coupled radiating elements, each element being fed in an unspecified way
- 5/314 . . . . . using frequency dependent circuits or components, e.g. trap circuits or capacitors

- 5/321 . . . . within a radiating element or between connected radiating elements
- 5/328 . . . . between a radiating element and ground
- 5/335 . . . . at the feed, e.g. for impedance matching
- 5/342 . . . . for different propagation modes ([H01Q 5/314 takes precedence](#))
- 5/35 . . . . using two or more simultaneously fed points
- 5/357 . . . . using a single feed point
- 5/364 . . . . . Creating multiple current paths
- 5/371 . . . . . Branching current paths
- 5/378 . . Combination of elements with parasitic elements
- 5/385 . . . Two or more parasitic elements
- 5/392 . . . the parasitic elements having dual-band or multi-band characteristics
- 5/40 . Imbricated or interleaved structures; Combined or electromagnetically coupled arrangements, e.g. comprising two or more non-connected fed radiating elements
- 5/42 . . using two or more imbricated arrays ([H01Q 5/49 takes precedence](#))
- 5/45 . . using two or more feeds in association with a common reflecting, diffracting or refracting device
- 5/47 . . . with a coaxial arrangement of the feeds
- 5/48 . . Combinations of two or more dipole type antennas
- 5/49 . . . with parasitic elements used for purposes other than for dual-band or multi-band, e.g. imbricated Yagi antennas
- 5/50 . Feeding or matching arrangements for broad-band or multi-band operation
- 5/55 . . for horn or waveguide antennas
- 7/00 Loop antennas with a substantially uniform current distribution around the loop and having a directional radiation pattern in a plane perpendicular to the plane of the loop**
- 7/005 . {with variable reactance for tuning the antenna}
- 7/02 . Collapsible antennas; Retractable antennas
- 7/04 . Screened antennas ([H01Q 7/02](#), [H01Q 7/06 take precedence](#))
- 7/06 . with core of ferromagnetic material ([H01Q 7/02 takes precedence](#))
- 7/08 . . Ferrite rod or like elongated core
- 9/00 Electrically-short antennas having dimensions not more than twice the operating wavelength and consisting of conductive active radiating elements**
- 9/005 . {for radiating non-sinusoidal waves}
- 9/02 . Non-resonant antennas
- 9/04 . Resonant antennas
- 9/0407 . . {Substantially flat resonant element parallel to ground plane, e.g. patch antenna ([dipole H01Q 9/285](#); [monopole H01Q 9/40](#))}
- 9/0414 . . . {in a stacked or folded configuration}
- 9/0421 . . . {with a shorting wall or a shorting pin at one end of the element ([H01Q 9/0414 takes precedence](#))}
- 9/0428 . . . {radiating a circular polarised wave}
- 9/0435 . . . . {using two feed points}
- 9/0442 . . . {with particular tuning means}
- 9/045 . . . {with particular feeding means ([for circular polarisation H01Q 9/0428](#))}
- 9/0457 . . . . {electromagnetically coupled to the feed line}
- 9/0464 . . . {Annular ring patch}
- 9/0471 . . . {Non-planar, stepped or wedge-shaped patch}
- 9/0478 . . . {with means for suppressing spurious modes, e.g. cross polarisation}
- 9/0485 . . {Dielectric resonator antennas}
- 9/0492 . . . {circularly polarised}
- 9/06 . . Details
- 9/065 . . . {Microstrip dipole antennas ([patch antenna H01Q 9/0407](#))}
- 9/08 . . . Junction boxes specially adapted for supporting adjacent ends of collinear rigid elements
- 9/10 . . . Junction boxes specially adapted for supporting adjacent ends of divergent elements
- 9/12 . . . . adapted for adjustment of angle between elements
- 9/14 . . . Length of element or elements adjustable ([telescopic elements H01Q 1/10](#))
- 9/145 . . . . {by varying the electrical length}
- 9/16 . . with feed intermediate between the extremities of the antenna, e.g. centre-fed dipole ([H01Q 9/44 takes precedence](#))
- 9/18 . . . Vertical disposition of the antenna
- 9/20 . . . Two collinear substantially straight active elements; Substantially straight single active elements ([H01Q 9/28 takes precedence](#))
- 9/22 . . . . Rigid rod or equivalent tubular element or elements
- 9/24 . . . . Shunt feed arrangements to single active elements, e.g. for delta matching
- 9/26 . . . with folded element or elements, the folded parts being spaced apart a small fraction of operating wavelength ([resonant loop antennas H01Q 7/00](#))
- 9/265 . . . . {Open ring dipoles; Circular dipoles}
- 9/27 . . . . Spiral antennas
- 9/28 . . . Conical, cylindrical, cage, strip, gauze, or like elements having an extended radiating surface; Elements comprising two conical surfaces having collinear axes and adjacent apices and fed by two-conductor transmission lines ([waveguide horns or mouths H01Q 13/00](#); [slot antennas H01Q 13/00](#))
- 9/285 . . . . {Planar dipole ([H01Q 9/065 takes precedence](#); [patch antenna H01Q 9/0407](#))}
- 9/30 . . with feed to end of elongated active element, e.g. unipole ([H01Q 9/44 takes precedence](#))
- 9/32 . . . Vertical arrangement of element ([H01Q 9/40 takes precedence](#))
- 9/34 . . . . Mast, tower, or like self-supporting or stay-supported antennas
- 9/36 . . . . with top loading
- 9/38 . . . . with counterpoise ([with counterpoise comprising elongated elements coplanar with the active element H01Q 9/44](#))
- 9/40 . . . Element having extended radiating surface
- 9/42 . . . with folded element, the folded parts being spaced apart a small fraction of the operating wavelength
- 9/43 . . . . Scimitar antennas

- 9/44 . . with a plurality of divergent straight elements, e.g. V-dipole, X-antenna; with a plurality of elements having mutually inclined substantially straight portions (combinations of two or more active elements [H01Q 21/00](#); turnstile antennas [H01Q 21/26](#))
- 9/46 . . . with rigid elements diverging from single point
- 11/00 Electrically-long antennas having dimensions more than twice the shortest operating wavelength and consisting of conductive active radiating elements (leaky waveguides antennas or slot antennas [H01Q 13/00](#))**
- 11/02 . Non-resonant antennas, e.g. travelling-wave antenna (Yagi antennas [H01Q 19/30](#))
- 11/04 . . with parts bent, folded, shaped, screened or electrically loaded to obtain desired phase relation of radiation from selected sections of the antenna ([H01Q 11/06](#) – [H01Q 11/10](#) take precedence)
- 11/06 . . Rhombic antennas; V-antennas
- 11/08 . . Helical antennas
- 11/083 . . . {Tapered helical aerials, e.g. conical spiral aerials}
- 11/086 . . . {collapsible}
- 11/10 . . Logperiodic antennas ([H01Q 11/08](#) takes precedence)
- 11/105 . . . {using a dielectric support}
- 11/12 . Resonant antennas
- 11/14 . . with parts bent, folded, shaped or screened or with phasing impedances, to obtain desired phase relation of radiation from selected sections of the antenna or to obtain desired polarisation effect ([H01Q 11/20](#) takes precedence)
- 11/16 . . . in which the selected sections are collinear
- 11/18 . . . in which the selected sections are parallelly spaced
- 11/20 . . V-antennas
- 13/00 Waveguide horns or mouths; Slot antennas; Leaky-waveguide antennas; Equivalent structures causing radiation along the transmission path of a guided wave**
- 13/02 . Waveguide horns
- 13/0208 . . {Corrugated horns (waveguide mouth antenna with corrugated flange [H01Q 13/065](#); manufacturing details [H01Q 13/0283](#))}
- 13/0216 . . . {Dual-depth corrugated horns}
- 13/0225 . . . {of non-circular cross-section ([H01Q 13/0216](#) takes precedence)}
- 13/0233 . . {Horns fed by a slotted waveguide array (biconical horns [H01Q 13/06](#))}
- 13/0241 . . {radiating a circularly polarised wave ([H01Q 13/0258](#) takes precedence; polarisation converters [H01Q 15/244](#), in a waveguide [H01P 1/17](#))}
- 13/025 . . {Multimode horn antennas; Horns using higher mode of propagation ([H01Q 13/0241](#) takes precedence; multiple beam [H01Q 25/04](#))}
- 13/0258 . . . {Orthomode horns (orthomode transducers [H01P 1/161](#))}
- 13/0266 . . {provided with a flange or a choke}
- 13/0275 . . {Ridged horns (slot-line radiating ends [H01Q 13/085](#))}
- 13/0283 . . {Apparatus or processes specially provided for manufacturing horns}
- 13/0291 . . . {for corrugated horns}
- 13/04 . . Biconical horns (biconical dipoles comprising two conical surfaces having collinear axes and adjacent apices and fed by a two-conductor transmission line [H01Q 9/28](#))
- 13/06 . Waveguide mouths (horns [H01Q 13/02](#))
- 13/065 . . {provided with a flange or a choke}
- 13/08 . Radiating ends of two-conductor microwave transmission lines, e.g. of coaxial lines, of microstrip lines
- 13/085 . . {Slot-line radiating ends}
- 13/10 . Resonant slot antennas
- 13/103 . . {with variable reactance for tuning the antenna (tuning resonant circuits [H03J](#))}
- 13/106 . . {Microstrip slot antennas (patch antenna elements [H01Q 9/0407](#))}
- 13/12 . . Longitudinally slotted cylinder antennas; Equivalent structures
- 13/14 . . . Skeleton cylinder antennas
- 13/16 . . Folded slot antennas
- 13/18 . . the slot being backed by, or formed in boundary wall of, a resonant cavity (longitudinally slotted cylinder [H01Q 13/12](#)); {Open cavity antennas}
- 13/20 . Non-resonant leaky-waveguide or transmission-line antennas; Equivalent structures causing radiation along the transmission path of a guided wave
- 13/203 . . {Leaky coaxial lines}
- 13/206 . . {Microstrip transmission line antennas}
- 13/22 . . Longitudinal slot in boundary wall of waveguide or transmission line ({[H01Q 13/203](#) takes precedence})
- 13/24 . . constituted by a dielectric or ferromagnetic rod or pipe ([H01Q 13/28](#) takes precedence)
- 13/26 . . Surface waveguide constituted by a single conductor, e.g. strip conductor
- 13/28 . . comprising elements constituting electric discontinuities and spaced in direction of wave propagation, e.g. dielectric elements or conductive elements forming artificial dielectric
- 15/00 Devices for reflection, refraction, diffraction or polarisation of waves radiated from an antenna, e.g. quasi-optical devices (variable for purpose of altering directivity [H01Q 3/00](#); arrangements of such devices for guiding waves [H01P 3/20](#); variable for purpose of modulation [H03C 7/02](#))**
- 15/0006 . {Devices acting selectively as reflecting surface, as diffracting or as refracting device, e.g. frequency filtering or angular spatial filtering devices ([H01Q 15/12](#), [H01Q 15/22](#), [H01Q 15/24](#) take precedence)}
- 15/0013 . . {said selective devices working as frequency-selective reflecting surfaces, e.g. FSS, dichroic plates, surfaces being partly transmissive and reflective}
- 15/002 . . . {said selective devices being reconfigurable or tunable, e.g. using switches or diodes}
- 15/0026 . . . {said selective devices having a stacked geometry or having multiple layers}
- 15/0033 . . . {used for beam splitting or combining, e.g. acting as a quasi-optical multiplexer ([H01Q 19/191](#) and [H01Q 19/195](#) take precedence)}
- 15/004 . . . {using superconducting materials or magnetised substrates}

- 15/0046 . . . {Theoretical analysis and design methods of such selective devices}
- 15/0053 . . {Selective devices used as spatial filter or angular sidelobe filter}
- 15/006 . . {Selective devices having photonic band gap materials or materials of which the material properties are frequency dependent, e.g. perforated substrates, high-impedance surfaces}
- 15/0066 . . . {said selective devices being reconfigurable, tunable or controllable, e.g. using switches}
- 15/0073 . . . {said selective devices having corrugations}
- 15/008 . . . {said selective devices having Sievenpipers' mushroom elements}
- 15/0086 . . {said selective devices having materials with a synthesized negative refractive index, e.g. metamaterials or left-handed materials}
- 15/0093 . . {having a fractal shape}
- 15/02 . Refracting or diffracting devices, e.g. lens, prism
- 15/04 . . comprising wave-guiding channel or channels bounded by effective conductive surfaces substantially perpendicular to the electric vector of the wave, e.g. parallel-plate waveguide lens
- 15/06 . . comprising plurality of wave-guiding channels of different length
- 15/08 . . formed of solid dielectric material
- 15/10 . . comprising three-dimensional array of impedance discontinuities, e.g. holes in conductive surfaces or conductive discs forming artificial dielectric
- 15/12 . . functioning also as polarisation filter {(polarisation converters [H01Q 15/242](#))}
- 15/14 . Reflecting surfaces; Equivalent structures {(electromagnetic shields [H01Q 1/526](#))}
- 15/141 . . {Apparatus or processes specially adapted for manufacturing reflecting surfaces}
- 15/142 . . . {using insulating material for supporting the reflecting surface}
- 15/144 . . . . {with a honeycomb, cellular or foamed sandwich structure}
- 15/145 . . {comprising a plurality of reflecting particles, e.g. radar chaff (missiles of the signal type provided with means for disseminating radar-reflecting chaff [F42B 12/70](#))}
- 15/147 . . {provided with means for controlling or monitoring the shape of the reflecting surface (for scanning [H01Q 3/01](#); aerials or aerial systems providing multiple beamwidths [H01Q 25/002](#))}
- 15/148 . . {with means for varying the reflecting properties ([H01Q 15/147](#) takes precedence)}
- 15/16 . . curved in two dimensions, e.g. paraboloidal
- 15/161 . . . {Collapsible reflectors}
- 15/162 . . . . {composed of a plurality of rigid panels}
- 15/163 . . . . {inflatable}
- 15/165 . . . {composed of a plurality of rigid panels (collapsible [H01Q 15/161](#))}
- 15/166 . . . . {sector shaped}
- 15/167 . . . . {comprising a gap between adjacent panels or group of panels, e.g. stepped reflectors}
- 15/168 . . . {Mesh reflectors mounted on a non-collapsible frame}
- 15/18 . . comprising plurality of mutually inclined plane surfaces, e.g. corner reflector {(H01Q 15/16 takes precedence)}
- 15/20 . . . Collapsible reflectors
- 15/22 . . functioning also as polarisation filter
- 15/23 . Combinations of reflecting surfaces with refracting or diffracting devices
- 15/24 . Polarising devices; Polarisation filters ([H01Q 15/12](#), [H01Q 15/22](#) take precedence)
- 15/242 . . . {Polarisation converters}
- 15/244 . . . . {converting a linear polarised wave into a circular polarised wave (guided wave [H01P 1/17](#))}
- 15/246 . . . . {rotating the plane of polarisation of a linear polarised wave (guided wave [H01P 1/165](#))}
- 15/248 . . . . . {using a reflecting surface, e.g. twist reflector (combination with a polarisation filter in dual reflector antennas [H01Q 19/195](#))}
- 17/00** **Devices for absorbing waves radiated from an antenna; Combinations of such devices with active antenna elements or systems**
- 17/001 . {for modifying the directional characteristic of an aerial}
- 17/002 . {using short elongated elements as dissipative material, e.g. metallic threads or flake-like particles}
- 17/004 . {using non-directional dissipative particles, e.g. ferrite powders ([H01Q 17/005](#) takes precedence; flake-like [H01Q 17/002](#))}
- 17/005 . {using woven or wound filaments; impregnated nets or clothes}
- 17/007 . {with means for controlling the absorption}
- 17/008 . {with a particular shape ([H01Q 17/007](#) takes precedence)}
- 19/00** **Combinations of primary active antenna elements and units with secondary devices, e.g. with quasi-optical devices, for giving the antenna a desired directional characteristic {(combination of horns with slotted waveguide array [H01Q 13/0233](#))}**
- 19/005 . {Patch antenna using one or more coplanar parasitic elements}
- 19/02 . Details {(fastening of an element on a boom [H01Q 1/1228](#))}
- 19/021 . . {Means for reducing undesirable effects}
- 19/022 . . . {for reducing the edge scattering of reflectors}
- 19/023 . . . {for reducing the scattering of mounting structures, e.g. of the struts}
- 19/025 . . . . {for optimizing the matching of the primary feed, e.g. vertex plates}
- 19/026 . . . . {for reducing the primary feed spill-over}
- 19/027 . . . . {for compensating or reducing aperture blockage (offset feeding [H01Q 19/132](#), [H01Q 19/192](#))}
- 19/028 . . . . {for reducing the cross polarisation}
- 19/04 . . Means for collapsing H-antennas or Yagi antennas
- 19/06 . using refracting or diffracting devices, e.g. lens {(radome [H01Q 1/42](#))}
- 19/062 . . {for focusing}
- 19/065 . . . {Zone plate type antennas}
- 19/067 . . {using a hologram}
- 19/08 . . for modifying the radiation pattern of a radiating horn in which it is located {(corrugated horns [H01Q 13/0208](#); producing a circular polarisation [H01Q 13/0241](#))}

- 19/09 . . wherein the primary active element is coated with or embedded in a dielectric or magnetic material (protective material [H01Q 1/40](#), varying the electric or magnetic characteristics of refracting or diffracting devices [H01Q 3/44](#))
- 19/10 . using reflecting surfaces
- 19/102 . . {wherein the surfaces are of convex toroidal shape (biconical horns [H01Q 13/04](#))}
- 19/104 . . {using a substantially flat reflector for deflecting the radiated beam, e.g. periscopic antennas (periscopic fed Cassegrain antennas [H01Q 19/191](#); passive relays [H04B 7/145](#))}
- 19/106 . . {using two or more intersecting plane surfaces, e.g. corner reflector antennas}
- 19/108 . . {Combination of a dipole with a plane reflecting surface ([H01Q 19/106](#) takes precedence; strip line [H01Q 9/065](#))}
- 19/12 . . wherein the surfaces are concave ([H01Q 19/18](#) takes precedence)
- 19/13 . . . the primary radiating source being a single radiating element, e.g. a dipole, a slot, a waveguide termination ([H01Q 19/15](#) takes precedence)
- 19/132 . . . . {Horn reflector antennas; Off-set feeding}
- 19/134 . . . . {Rear-feeds; Splash plate feeds}
- 19/136 . . . . {cross-polarised}
- 19/138 . . . . {Parallel-plate feeds, e.g. pill-box, cheese aerials}
- 19/15 . . . the primary radiating source being a line source, e.g. leaky waveguide antennas
- 19/17 . . . the primary radiating source comprising two or more radiating elements ([H01Q 19/15](#), [H01Q 25/00](#) take precedence)
- 19/175 . . . . {arrayed along the focal line of a cylindrical focusing surface}
- 19/18 . . having two or more spaced reflecting surfaces ([H01Q 19/20](#) takes precedence)
- 19/185 . . . wherein the surfaces are plane
- 19/19 . . . comprising one main concave reflecting surface associated with an auxiliary reflecting surface
- 19/191 . . . . {wherein the primary active element uses one or more deflecting surfaces, e.g. beam waveguide feeds}
- 19/192 . . . . {with dual offset reflectors}
- 19/193 . . . . {with feed supported subreflector (splash plate feeds [H01Q 19/134](#))}
- 19/195 . . . . wherein a reflecting surface acts also as a polarisation filter or a polarising device
- 19/20 . Producing pencil beam by two cylindrical focusing devices with their focal lines orthogonally disposed
- 19/22 . using a secondary device in the form of a single substantially straight conductive element
- 19/24 . . the primary active element being centre-fed and substantially straight, e.g. H-antenna
- 19/26 . . the primary active element being end-fed and elongated
- 19/28 . using a secondary device in the form of two or more substantially straight conductive elements (log-periodic antennas [H01Q 11/10](#); constituting a reflecting surface [H01Q 19/10](#))
- 19/30 . . the primary active element being centre-fed and substantially straight, e.g. Yagi antenna
- 19/32 . . the primary active element being end-fed and elongated

**21/00**

**Antenna arrays or systems** (arrangements for changing or varying the orientation or the shape of the directional pattern of the waves radiated from an antenna or antenna system [H01Q 3/00](#))

**NOTE**

This group includes:

- arrays comprising two or more individually energised similar active aerial units spaced apart;
- combinations of different types of active aerials or arrays;
- combinations of substantially independent non-interacting active aerials or arrays.

- 21/0006 . {Particular feeding systems}
- 21/0012 . . {Radial guide fed arrays}
- 21/0018 . . {Space-fed arrays}
- 21/0025 . . {Modular arrays}
- 21/0031 . . {Parallel-plate fed arrays; Lens-fed arrays (multibeam arrays [H01Q 25/008](#))}
- 21/0037 . . {Linear waveguide fed arrays}
- 21/0043 . . . {Slotted waveguides (combination with horns [H01Q 13/0233](#))}
- 21/005 . . . . {Slotted waveguides arrays}
- 21/0056 . . . . {Conically or cylindrically arrayed}
- 21/0062 . . . . {the slots being disposed around the feeding waveguide}
- 21/0068 . . . {Dielectric waveguide fed arrays}
- 21/0075 . . {Stripline fed arrays ([H01Q 21/065](#) takes precedence)}
- 21/0081 . . . {using suspended striplines}
- 21/0087 . {Apparatus or processes specially adapted for manufacturing antenna arrays (manufacturing waveguides [H01P 11/00](#))}
- 21/0093 . . {Monolithic arrays}
- 21/06 . Arrays of individually energised antenna units similarly polarised and spaced apart
- 21/061 . . {Two dimensional planar arrays}
- 21/062 . . . {using dipole aerials; ([H01Q 21/067](#), [H01Q 21/068](#) take precedence)}
- 21/064 . . . {using horn or slot aerials (slotted waveguides arrays [H01Q 21/005](#))}
- 21/065 . . . {Patch antenna array}
- 21/067 . . . {using endfire radiating aerial units transverse to the plane of the array}
- 21/068 . . . {using parallel coplanar travelling wave or leaky wave aerial units ([H01Q 21/065](#) takes precedence)}
- 21/08 . . the units being spaced along or adjacent to a rectilinear path {(waveguide fed [H01Q 21/0037](#))}
- 21/10 . . . Collinear arrangements of substantially straight elongated conductive units
- 21/12 . . . Parallel arrangements of substantially straight elongated conductive units (travelling-wave antennas comprising transmission line loaded with transverse elements [H01Q 11/02](#); Yagi antennas [H01Q 19/30](#))
- 21/14 . . . . Adcock antennas
- 21/16 . . . . . U-type
- 21/18 . . . . . H-type
- 21/20 . . the units being spaced along or adjacent to a curvilinear path {(slotted waveguide arrays [H01Q 21/005](#); circularly or helically slotted waveguides [H01Q 21/0062](#))}

## H01Q

- 21/205 . . . {providing an omnidirectional coverage (turnstile aerials [H01Q 21/26](#))}
- 21/22 . . Antenna units of the array energised non-uniformly in amplitude or phase, e.g. tapered array or binomial array
- 21/225 . . . {Finite focus antenna arrays}
- 21/24 . Combinations of antenna units polarised in different directions for transmitting or receiving circularly and elliptically polarised waves or waves linearly polarised in any direction {(circularly polarised patch antennas [H01Q 9/0428](#); circularly polarised horns [H01Q 13/0241](#); cross-polarised horns [H01Q 13/0258](#); polarisation converters [H01Q 15/242](#); cross-polarised rear feeds [H01Q 19/136](#); crossed polarisation dual antenna [H01Q 25/001](#))}
- 21/245 . . {provided with means for varying the polarisation (polarising devices [H01Q 15/24](#); tracking by comparing linear polarisation compounds [G01S 3/146](#); reducing depolarisation effects [H04B 7/00](#); polarisation diversity [H04B 7/10](#))}
- 21/26 . . Turnstile or like antennas comprising arrangements of three or more elongated elements disposed radially and symmetrically in a horizontal plane about a common centre
- 21/28 . Combinations of substantially independent non-interacting antenna units or systems {(multiple beam [H01Q 25/00](#))}
- 21/29 . Combinations of different interacting antenna units for giving a desired directional characteristic ([H01Q 25/00](#) takes precedence)
- 21/293 . . {one unit or more being an array of identical aerial elements (adaptive arrays [H01Q 3/2605](#))}
- 21/296 . . . {Multiplicative arrays}
- 21/30 . Combinations of separate antenna units operating in different wavebands and connected to a common feeder system

### **23/00 Antennas with active circuits or circuit elements integrated within them or attached to them**

#### **NOTES**

1. This group covers only such combinations in which the type of antenna or antenna element is immaterial.
2. Combinations with a particular type of antenna are classified in the group appropriate to that type.

### **25/00 Antennas or antenna systems providing at least two radiating patterns (arrangements for changing or varying the orientation or the shape of the directional pattern [H01Q 3/00](#))**

- 25/001 . {Crossed polarisation dual antennas (orthomode horns [H01Q 13/0258](#); cross-polarised rear feeds [H01Q 19/136](#); orthomode transducers [H01P 1/161](#))}
- 25/002 . {providing at least two patterns of different beamwidth; Variable beamwidth antennas}
- 25/004 . {providing two or four symmetrical beams for Janus application}
- 25/005 . {providing two patterns of opposite direction; back to back antennas ([H01Q 25/004](#) takes precedence)}
- 25/007 . {using two or more primary active elements in the focal region of a focusing device (for operation on different wavebands [H01Q 5/22](#))}
- 25/008 . . {lens fed multibeam arrays}