

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

1. This subclass covers:
 - in addition to the primary active radiating elements,
 - i. secondary devices for absorbing or for modifying the direction or polarisation of waves radiated from antennas, and
 - ii. combinations with auxiliary devices such as earthing switches, lead-in devices, and lightning protectors;
 - both transmitting and receiving antennas.
2. 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](#).
3. 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	Details of, or arrangements associated with, antennas (arrangements for varying orientation of directional pattern H01Q 3/00)	1/087	. . . {Extensible roll- up aerials}
		1/088	. . {Quick-releasable antenna elements}
		1/10	. . Telescopic elements
		1/103	. . . {Latching means; ensuring extension or retraction thereof}
		1/106	. . . {Means for locking or protecting against unauthorized extraction}
		1/12	. Supports; Mounting means
		1/1207	. . {for fastening a rigid aerial element}
		1/1214	. . . {through a wall}
		1/1221	. . . {onto a wall}
		1/1228	. . . {on a boom}
		1/1235	. . {Collapsible supports; Means for erecting a rigid antenna}
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	. . {Means for positioning}
1/007	. {specially adapted for indoor communication}	1/1257	. . . {using the received signal strength}
1/02	. Arrangements for de-icing; Arrangements for drying-out ; Arrangements for cooling; Arrangements for preventing corrosion}	1/1264	. . . {Adjusting different parts or elements of an aerial unit}
1/04	. Adaptation for subterranean or subaqueous use	1/1271	. . {for mounting on windscreens}
1/06	. Means for the lighting or illuminating of antennas, e.g. for purpose of warning	1/1278	. . . {in association with heating wires or layers}
1/08	. Means for collapsing antennas or parts thereof (collapsible loop antennas H01Q 7/02 ; means for collapsing H-antennas or Yagi antennas H01Q 19/04)	1/1285	. . . {with capacitive feeding through the windscreen}
1/081	. . {Inflatable antennas}	1/1292	. . {for mounting on balloons}
1/082	. . . {Balloon antennas}	1/14	. . for wire or other non-rigid radiating elements
1/084	. . {Pivotable antennas}	1/16	. . . Strainers, spreaders, or spacers
1/085	. . {Flexible aerials; Whip aerials with a resilient base}	1/18	. . Means for stabilising antennas on an unstable platform
		1/185	. . . {by electronic means}
		1/20	. . Resilient mountings
		1/22	. . by structural association with other equipment or articles

- 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 fed 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 aeriels, e.g. conical spiral aeriels}
- 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](#))}

- 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}

- 25/02 . providing sum and difference patterns ([H01Q 25/04](#) takes precedence)
- 25/04 . Multimode antennas {(corrugated horns [H01Q 13/0208](#))}