

## SECTION H — ELECTRICITY

### H01 BASIC ELECTRIC ELEMENTS

**H01Q AERIALS** (microwave radiators for near-field therapeutic treatment A61N 5/04; apparatus for testing aerials or for measuring aerial characteristics G01R; waveguides H01P; radiators or aerials for microwave heating H05B 6/72)

#### Note(s)

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 aerials, and
    - ii. combinations with auxiliary devices such as earthing switches, lead-in devices, and lightning protectors;
  - both transmitting and receiving aerials.
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 aerial.

#### Subclass index

##### TYPES OF AERIALS

Loop type.....	7/00
Waveguide type.....	13/00
Other type: short; long.....	9/00, 11/00

##### DEVICES FOR INFLUENCING RADIATED WAVES

Quasi-optical; absorbing.....	15/00, 17/00
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##### COMBINATIONS OF PRIMARY ACTIVE ELEMENTS WITH SECONDARY DEVICES.....19/00

##### COMBINATIONS OF AERIALS WITH ACTIVE CIRCUITS OR CIRCUIT ELEMENTS.....23/00

##### ARRANGEMENTS PROVIDING MORE THAN ONE RADIATION PATTERN.....25/00

##### AERIAL ARRAYS OR SYSTEMS.....21/00

##### SPECIAL ARRANGEMENTS

Details; orientation; simultaneity.....	1/00, 3/00, 5/00
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**1/00 Details of, or arrangements associated with, aerials**  
(arrangements for varying orientation of directional pattern H01Q 3/00)

#### Note(s)

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| <ol style="list-style-type: none"> <li>1. This group <u>covers</u> only:           <ul style="list-style-type: none"> <li>• structural details or features of aerials not dependent on electric operation;</li> <li>• structural details or features applicable to more than one type of aerial or aerial element.</li> </ul> </li> <li>2. Structural details or features described with reference to, or clearly applicable only to, aerials or aerial elements of a particular type are classified in the group appropriate to that type.</li> </ol> | <ol style="list-style-type: none"> <li>1/02 • Arrangements for de-icing; Arrangements for drying-out</li> <li>1/04 • Adaptation for subterranean or subaqueous use</li> <li>1/06 • Means for the lighting or illuminating of aerials, e.g. for purpose of warning</li> <li>1/08 • Means for collapsing aerials or parts thereof (collapsible loop aerials H01Q 7/02; collapsible H-aerials or Yagi aerials H01Q 19/04)</li> <li>1/10 • • Telescopic elements</li> </ol> | <ol style="list-style-type: none"> <li>1/12 • Supports; Mounting means (supporting conductors in general H02G 7/00)</li> <li>1/14 • • for wire or other non-rigid radiating elements</li> <li>1/16 • • • Strainers, spreaders, or spacers</li> <li>1/18 • • Means for stabilising aerials on an unstable platform</li> <li>1/20 • • Resilient mountings</li> <li>1/22 • • by structural association with other equipment or articles</li> <li>1/24 • • • with receiving set</li> <li>1/26 • • • with electric discharge tube</li> <li>1/27 • Adaptation for use in or on movable bodies (H01Q 1/08, H01Q 1/12, H01Q 1/18 take precedence) [3]</li> <li>1/28 • • Adaptation for use in or on aircraft, missiles, satellites, or balloons [3]</li> <li>1/30 • • • Means for trailing aerials [3]</li> <li>1/32 • • Adaptation for use in or on road or rail vehicles (telescopic elements H01Q 1/10; resilient mountings for aerials H01Q 1/20) [3]</li> <li>1/34 • • Adaptation for use in or on ships, submarines, buoys, or torpedoes (for subaqueous use H01Q 1/04; retractable loop aerials H01Q 7/02) [3]</li> </ol> |
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## H01Q

- 1/36 • Structural form of radiating elements, e.g. cone, spiral, umbrella (H01Q 1/08, H01Q 1/14 take precedence)
- 1/38 • • formed by a conductive layer on an insulating support (conductors in general H01B 5/14)
- 1/40 • Radiating elements coated with, or embedded in, protective material
- 1/42 • Housings not intimately mechanically associated with radiating elements, e.g. radome
- 1/44 • using equipment having another main function to serve additionally as an aerial (H01Q 1/28-H01Q 1/34 take precedence)
- 1/46 • • Electric supply lines or communication lines
- 1/48 • Earthing means; Earth screens; Counterpoises (earthing pins H01R 4/66)
- 1/50 • Structural association of aerials with earthing switches, lead-in devices, or lightning protectors (lead-in devices H01B; lightning protectors, switches H01H)
- 1/52 • Means for reducing coupling between aerials; Means for reducing coupling between an aerial and another structure (absorbing means H01Q 17/00)

### **3/00 Arrangements for changing or varying the orientation or the shape of the directional pattern of the waves radiated from an aerial or aerial system**

- 3/01 • varying the shape of the aerial or aerial system [3]
- 3/02 • using mechanical movement of aerial or aerial 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 aerials or aerial 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
- 3/26 • 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 3/22, H01Q 3/24 take precedence)
- 3/28 • • varying the amplitude [3]
- 3/30 • • varying the phase [3]
- 3/32 • • • by mechanical means [3]
- 3/34 • • • by electrical means (active lenses or reflecting arrays H01Q 3/46) [3]
- 3/36 • • • • with variable phase-shifters [3]
- 3/38 • • • • the phase-shifters being digital [3]
- 3/40 • • • • with phasing matrix [3]
- 3/42 • • • • using frequency-mixing [3]
- 3/44 • varying the electric or magnetic characteristics of reflecting, refracting, or diffracting devices associated with the radiating element [3]
- 3/46 • • Active lenses or reflecting arrays [3]

### **5/00 Arrangements for simultaneous operation of aerials on two or more different wavebands** (length of elements adjustable H01Q 9/14; combinations of separate active aerial units operating in different wavebands and connected to a common feeder system H01Q 21/30) [3]

- 5/01 • Resonant aerials [3]
- 5/02 • • for operation of centre-fed aerials which comprise a single, or two or more collinear, substantially straight elongated active elements [3]

### **7/00 Loop aerials 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**

- 7/02 • Collapsible aerials; Retractable aerials
- 7/04 • Screened aerials (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 aerials having dimensions not more than twice the operating wavelength and consisting of conductive active radiating elements** (loop aerials H01Q 7/00; waveguide horns or mouths H01Q 13/00; slot aerials H01Q 13/00; combinations of active elements with secondary devices to give desired directional characteristic H01Q 19/00; combinations of two or more active elements H01Q 21/00)

- 9/02 • Non-resonant aerials
- 9/04 • Resonant aerials
- 9/06 • • Details
- 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)
- 9/16 • • with feed intermediate between the extremities of the aerial, e.g. centre-fed dipole (H01Q 9/44 takes precedence)
- 9/18 • • • Vertical disposition of the aerial
- 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 aerials H01Q 7/00)
- 9/27 • • • • Spiral aerials [3]
- 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 (biconical horns H01Q 13/04)
- 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 aerials
- 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 aerials [3]
- 9/44 • • with plurality of divergent straight elements, e.g. V-dipole, X-aerial; with plurality of elements having mutually inclined substantially straight portions (turnstile aerials H01Q 21/26)
- 9/46 • • • with rigid elements diverging from single point
- 11/00 Electrically-long aerials having dimensions more than twice the shortest operating wavelength and consisting of conductive active radiating elements** (leaky-waveguide aerials, slot aerials H01Q 13/00; combinations of active elements with secondary devices to give desired directional characteristic H01Q 19/00; aerial arrays or systems H01Q 21/00)
- 11/02 • Non-resonant aerials, e.g. travelling-wave aerial
- 11/04 • • with parts bent, folded, shaped, screened, or electrically loaded to obtain desired phase relation of radiation from selected sections of the aerial (rhombic aerials, V-aerials H01Q 11/06)
- 11/06 • • Rhombic aerials; V-aerials
- 11/08 • • Helical aerials
- 11/10 • • Log-periodic aerials (H01Q 11/08 takes precedence) [3]
- 11/12 • Resonant aerials
- 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 aerial or to obtain desired polarisation effects
- 11/16 • • • in which the selected sections are collinear
- 11/18 • • • in which the selected sections are parallelly spaced [3]
- 11/20 • • V-aerials
- 13/00 Waveguide horns or mouths; Slot aerials; Leaky-waveguide aerials; Equivalent structures causing radiation along the transmission path of a guided wave** (multimode aerials H01Q 25/04)
- 13/02 • Waveguide 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)
- 13/08 • Radiating ends of two-conductor microwave transmission lines, e.g. of coaxial lines, of microstrip lines
- 13/10 • Resonant slot aerials
- 13/12 • • Longitudinally slotted cylinder aerials; Equivalent structures
- 13/14 • • • Skeleton cylinder aerials
- 13/16 • • Folded slot aerials
- 13/18 • • the slot being backed by, or formed in boundary wall of, a resonant cavity (longitudinally slotted cylinder H01Q 13/12)
- 13/20 • Non-resonant leaky-waveguide or transmission-line aerials; Equivalent structures causing radiation along the transmission path of a guided wave
- 13/22 • • Longitudinal slot in boundary wall of waveguide or transmission line
- 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, conductive elements forming artificial dielectric (Yagi aerials H01Q 19/30)
- 15/00 Devices for reflection, refraction, diffraction, or polarisation of waves radiated from an aerial, 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)
- 15/02 • 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 (leaky-waveguide aerials H01Q 13/28)
- 15/12 • • functioning also as polarisation filter
- 15/14 • Reflecting surfaces; Equivalent structures
- 15/16 • • curved in two dimensions, e.g. paraboloidal
- 15/18 • • comprising plurality of mutually inclined plane surfaces, e.g. corner reflector
- 15/20 • • • Collapsible reflectors
- 15/22 • • functioning also as polarisation filter
- 15/23 • Combinations of reflecting surfaces with refracting or diffracting devices [3]
- 15/24 • Polarising devices; Polarisation filters (devices functioning simultaneously both as polarisation filters and as refracting or diffracting devices or as reflectors H01Q 15/12, H01Q 15/22)
- 17/00 Devices for absorbing waves radiated from an aerial; Combinations of such devices with active aerial elements or systems**
- 19/00 Combinations of primary active aerial elements and units with secondary devices, e.g. with quasi-optical devices, for giving the aerial a desired directional characteristic**
- 19/02 • Details
- 19/04 • • Means for collapsing H-aerials or Yagi aerials
- 19/06 • using refracting or diffracting devices, e.g. lens
- 19/08 • • for modifying the radiation pattern of a radiating horn in which it is located
- 19/09 • • wherein the primary active element is coated with or embedded in a dielectric or magnetic material (protective material H01Q 1/40; with variable characteristics H01Q 3/44) [3]
- 19/10 • using reflecting surfaces
- 19/12 • • wherein the surfaces are concave (H01Q 19/18 takes precedence) [3]
- 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) [3]

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- 19/15 • • • the primary radiating source being a line source, e.g. leaky waveguide aerials [3]
- 19/17 • • • the primary radiating source comprising two or more radiating elements (H01Q 19/15, H01Q 25/00 take precedence) [3]
- 19/18 • • having two or more spaced reflecting surfaces (producing pencil beam by two cylindrical reflectors with their focal lines orthogonally disposed H01Q 19/20)
- 19/185 • • • wherein the surfaces are plane [3]
- 19/19 • • • comprising one main concave reflecting surface associated with an auxiliary reflecting surface [3]
- 19/195 • • • wherein a reflecting surface acts also as a polarisation filter or a polarising device [3]
- 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-aerial
- 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 aerials 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 aerial
- 19/32 • • the primary active element being end-fed and elongated
  
- 21/00 Aerial arrays or systems** (producing a beam the orientation or the shape of the directional pattern of which can be changed or varied H01Q 3/00; electrically-long aerials H01Q 11/00)
  - 21/06 • Arrays of individually energised aerial units similarly polarised and spaced apart
  - 21/08 • • the units being spaced along, or adjacent to, a rectilinear path
  - 21/10 • • • Collinear arrangements of substantially straight elongated conductive units
  
- 21/12 • • • Parallel arrangements of substantially straight elongated conductive units (travelling-wave aerials comprising transmission line loaded with transverse elements, e.g. "fishbone" aerial, H01Q 11/04)
- 21/14 • • • • Adcock aerials
- 21/16 • • • • • U-type
- 21/18 • • • • • H-type
- 21/20 • • the units being spaced along, or adjacent to, a curvilinear path
- 21/22 • • Aerial units of the array energised non-uniformly in amplitude or phase, e.g. tapered array, binomial array
- 21/24 • Combinations of aerial units polarised in different directions for transmitting or receiving circularly and elliptically polarised waves or waves linearly polarised in any direction
- 21/26 • • Turnstile or like aerials 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 aerial units or systems
- 21/29 • Combinations of different interacting aerial units for giving a desired directional characteristic (H01Q 25/00 takes precedence) [3]
- 21/30 • Combinations of separate aerial units operating in different wavebands and connected to a common feeder system
  
- 23/00 Aerials with active circuits or circuit elements integrated within them or attached to them [3]**

Note(s)

  1. This group covers only such combinations in which the type of aerial or aerial element is immaterial.
  2. Combinations with a particular type of aerial are classified in the group appropriate to that type.
  
- 25/00 Aerials or aerial systems providing at least two radiating patterns** (arrangements for changing or varying the orientation or the shape of the directional pattern H01Q 3/00) [3]
  - 25/02 • providing sum and difference patterns (multimode aerials H01Q 25/04) [3]
  - 25/04 • Multimode aerials [3]