

**H 01 Q AERIALS** (microwave radiators for near-field therapeutic treatment [A 61 N 5/04](#); apparatus for testing aerials or for measuring aerial characteristics [G 01 R](#); waveguides [H 01 P](#); radiators or aerials for microwave heating [H 05 B 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 aerials, and
    - (ii) combinations with auxiliary devices such as earthing switches, lead-in devices, and lightning protectors;
  - both transmitting and receiving aerials. **[3]**
- (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 [H 01 P](#).
- (3) In this subclass, the following expression is used with the meaning indicated:
  - “active radiating element” covers corresponding parts of a receiving aerial. **[3]**

**Subclass Index**

<p>TYPES OF AERIALS</p> <p>    Loop type .....7/00</p> <p>    Waveguide type .....13/00</p> <p>    Other type: short; long .....9/00; 11/00</p> <p>DEVICES FOR INFLUENCING RADIATED WAVES</p> <p>    Quasi-optical; absorbing .....15/00; 17/00</p> <p>COMBINATIONS OF PRIMARY ACTIVE ELEMENTS WITH SECONDARY DEVICES .....19/00</p>	<p>COMBINATIONS OF AERIALS WITH ACTIVE CIRCUITS OR CIRCUIT ELEMENTS .....23/00</p> <p>ARRANGEMENTS PROVIDING MORE THAN ONE RADIATION PATTERN .....25/00</p> <p>AERIAL ARRAYS OR SYSTEMS .....21/00</p> <p>SPECIAL ARRANGEMENTS</p> <p>    Details; orientation; simultaneity .....1/00; 3/00; 5/00</p>
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**1/00 Details of, or arrangements associated with, aerials**  
(arrangements for varying orientation of directional pattern [3/00](#))

**Notes**

- (1) This group covers only:
  - structural details or features of aerials not dependent on electric operation;
  - structural details or features applicable to more than one type of aerial or aerial element.
- (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.

- 1/02 . Arrangements for de-icing; Arrangements for drying-out
- 1/04 . Adaptation for subterranean or subaqueous use
- 1/06 . Means for the lighting or illuminating of aerials, e.g. for purpose of warning
- 1/08 . Means for collapsing aerials or parts thereof (collapsible loop aerials [7/02](#); collapsible H-aerials or Yagi aerials [19/04](#))
- 1/10 . . Telescopic elements
- 1/12 . Supports; Mounting means (supporting conductors in general [H 02 G 7/00](#))
- 1/14 . . for wire or other non-rigid radiating elements
- 1/16 . . . Strainers, spreaders, or spacers
- 1/18 . . Means for stabilising aerials on an unstable platform
- 1/20 . . Resilient mountings
- 1/22 . . by structural association with other equipment or articles
- 1/24 . . . with receiving set
- 1/26 . . . with electric discharge tube
- 1/27 . Adaptation for use in or on movable bodies ([1/08](#), [1/12](#), [1/18](#) take precedence) **[3]**

- 1/28 . . Adaptation for use in or on aircraft, missiles, satellites, or balloons **[3]**
- 1/30 . . . Means for trailing aerials **[3]**
- 1/32 . . Adaptation for use in or on road or rail vehicles (telescopic elements [1/10](#); resilient mountings for aerials [1/20](#)) **[3]**
- 1/34 . . Adaptation for use in or on ships, submarines, buoys, or torpedoes (for subaqueous use [1/04](#); retractable loop aerials [7/02](#)) **[3]**
- 1/36 . Structural form of radiating elements, e.g. cone, spiral, umbrella ([1/08](#), [1/14](#) take precedence)
- 1/38 . . formed by a conductive layer on an insulating support (conductors in general [H 01 B 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 ([1/28](#) to [1/34](#) take precedence)
- 1/46 . . Electric supply lines or communication lines
- 1/48 . Earthing means; Earth screens; Counterpoises (earthing pins [H 01 R 4/66](#))
- 1/50 . Structural association of aerials with earthing switches, lead-in devices, or lightning protectors (lead-in devices [H 01 B](#); lightning protectors, switches [H 01 H](#))
- 1/52 . Means for reducing coupling between aerials; Means for reducing coupling between an aerial and another structure (absorbing means [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 (3/22, 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 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 9/14; combinations of separate active aerial units operating in different wavebands and connected to a common feeder system 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 (7/02, 7/06 take precedence)
- 7/06 . with core of ferromagnetic material (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 7/00; waveguide horns or mouths 13/00; slot aerials 13/00; combinations of active elements with secondary devices to give desired directional characteristic 19/00; combinations of two or more active elements 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 1/10)
- 9/16 . . with feed intermediate between the extremities of the aerial, e.g. centre-fed dipole (9/44 takes precedence)
- 9/18 . . . Vertical disposition of the aerial
- 9/20 . . . Two collinear substantially straight active elements; Substantially straight single active elements (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 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 13/04)
- 9/30 . . with feed to end of elongated active element, e.g. unipole (9/44 takes precedence)
- 9/32 . . . Vertical arrangement of element (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 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 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 13/00; combinations of active elements with secondary devices to give desired directional characteristic 19/00; aerial arrays or systems 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 11/06)
- 11/06 . . Rhombic aerials; V-aerials
- 11/08 . . Helical aerials
- 11/10 . . Log-periodic aerials (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 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 9/28)
- 13/06 . Waveguide mouths (horns 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 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 (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 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 3/00; arrangements of such devices for guiding waves H 01 P 3/20; variable for purpose of modulation H 03 C 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 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 15/12, 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 1/40; with variable characteristics 3/44) [3]
- 19/10 . using reflecting surfaces
- 19/12 . . . wherein the surfaces are concave (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 (19/15 takes precedence) [3]
- 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 (19/15, 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 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 11/10; constituting a reflecting surface 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

## H 01 Q

- 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 [3/00](#); electrically-long aerials [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, [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 ([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]**

#### Notes

- (1) This group covers only such combinations in which the type of aerial or aerial element is immaterial. [3]
- (2) Combinations with a particular type of aerial are classified in the group appropriate to that type. [3]

### **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 [3/00](#)) [3]

- 25/02 . providing sum and difference patterns (multimode aerials [25/04](#)) [3]
- 25/04 . Multimode aerials [3]