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**ELECTRICAL AND MECHANICAL  
ENGINEERING REGULATIONS**

**INTER-SERVICES GLOSSARY OF  
TERMS USED IN  
TELECOMMUNICATIONS  
FOR USE IN ELECTRONIC ENGINEERING 1949**

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*Note : Promulgated for the information of all concerned.*

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## INTER-SERVICE GLOSSARY OF TERMS USED IN TELECOMMUNICATIONS

NOTES: 1. The glossary is intended to be used in conjunction with the British Standards Institution (B.S.I.) Glossary of Terms used in Telecommunications, B.S. 204:1943 and its supplements. B.S. 204:1943 has been reproduced as Army Publication E.M.E.R. Tels. A 305.

2. Any suggestions for amendment or addition should be submitted through the usual channels.

3. This issue, Pages 1 to 21, supersedes Pages 1 to 20 of Issue 1, dated 28 Apr. 1947, which has been revised throughout.

## CONTENTS

	Concepts	Pages		Concepts	Pages
<b>Introduction</b>					
<b>Section 1—Fundamental concepts</b> ... ..	101—113	1—2	<b>Section 3—Waveguide technique (contd.)</b>		
<b>Section 2—Aerials and propagation</b> ... ..	201—295	2—6	(e)—Adjusting and measuring devices ... ..	381—403	9
<b>Section 3—Waveguide technique</b> ... ..	301—403	6—9	<b>Section 4—Waveforms, circuits and circuit components</b> ... ..	501—646	9—14
Sub-section (a)—Fundamental terms ... ..	301—326	6—7	<b>Section 5—Valves</b> ... ..	701—741	14—15
Sub-section (b)—Waveguides ... ..	327—343	7	<b>Section 6—Cathode-ray tubes and displays</b> ...	801—857	15—17
Sub-section (c)—Mechanical accessories... ..	344—352	7—8	<b>Section 7—Identification (I.F.F.)</b> ... ..	901—911	17
Sub-section (d)—Coupling and mode-changing devices ... ..	353—380	8—9	<b>Index to terms</b> ... ..		18—21

## INTRODUCTION

1. This glossary has been prepared with the authority of the Radio and Cable Board by the Electronics Glossary and Symbols Panel of the Central Radio Bureau.

2. Where possible, an existing B.S.I. definition has been adopted. Where the Panel is of the opinion that the lapse of time has made the definition given in B.S. 204 unsuitable for Service use, a revised definition has been produced.

3. Certain concepts have been defined by B.S.I. since the first issue of this publication, and where they have been adopted in this issue they have been marked\*.

4. Definitions which have been published by B.S.I. have a suffix in brackets thus (B.S.204, No. 1234). Other definitions formulated by B.S.I. but not yet published, have the suffix (BSI).

5. Words printed in italics in the definitions are themselves defined elsewhere in the glossary. This rule does not apply to the term 'waveguide'.

6. In the definitions relating to aerials and their associated electromagnetic fields in space, where the concept of emission and radiation is explicitly cited, it is to be understood that the concept of reception and receptivity is implied also unless excluded by the context.

## SECTION I—FUNDAMENTAL CONCEPTS

## EXPLANATION

7. This section contains the fundamental concepts of 'RADIO' (as shown in Fig. 1, Page 2) and their definitions.

8. In preparing these definitions, the Electronics Glossary and Symbols Panel decided that regard must be paid to such definitions as already had been formulated with international agreement by the International Telecommunications Union for a somewhat different purpose. Regard must also be had for long-established usage, even if not entirely logical.

9. It was particularly desired by the Radio and Cable Board that 'Radiolocation' should be retained as a generic term with a wider meaning than that which it was given in 1941 (see B.S.204, No. 4110).

10. In view of the special importance of these basic definitions, and of the various factors which had to be taken into account in their formulation, explanatory notes in square brackets [thus] have been appended to nearly all of them.

## DEFINITIONS

## 101. Radio waves

Electromagnetic waves of wavelength greater than one tenth of a millimetre. (B.S.204 Supp. No. 3 No. 12101).

## 102. Radio communication (Wireless)

Telecommunication using radio waves not guided between sender and receiver by artificial discontinuities such as wires or waveguides. (B.S.204 Supp. No. 3 No. 12102) (see B.S.204, No. 4102).

['Wireless' has been retained as an alternative here (and nowhere else) for Service reasons, but its use is likely to be confined to Service radio-telemetry].

## 103. Radiolocation

Determination of relative direction, position or motion of an object, or its detection, by means of the constant-velocity or rectilinear-propagation characteristics of radio waves. (B.S.204 Supp. No. 3 No. 12103).

## 104. Radio control

The control of mechanism or other apparatus by radio waves.

Note: Radio-telecontrol is the distant control of mechanism or other apparatus by radio waves. Radio-autocontrol is the control of an object by radio reference from itself to other objects. (B.S.204 Supp. No. 3 No. 12104).

[The sub-division into Autocontrol and Telecontrol is largely for Service use, but follows the clearly-defined cleavage between 'reflection' technique and 'direct' transmission shown in the diagram as 'R' and 'D'].

## 105. Radio warning

Radio detection

The detection of the presence of an object by radiolocation without precise determination of its position. (B.S.204 Supp. No. 3 No. 12105).

[This function of Radio is rarely used apart from others but must be separately defined. The alternative term 'Radio detection' is preferred by the Royal Navy.]

## 106. Radio position-line determination

Determination of a position-line by radiolocation. (B.S.204 Supp. No. 3 No. 12106).

[This definition was introduced for logical completeness. It is not expected that this concept will be encountered in ordinary descriptive writing or speech, hence the cumbersome nature of the term is believed to be unimportant.]

## 107. Radio-doppler

The direct determination of the radial component of the relative velocity of an object by an observed frequency-change due to such velocity. (B.S.204 Supp. No. 3 No. 12107).

**108. Radio-gonometry**

The determination of relative direction of a distant object by means of its radio emissions, whether independent, reflected, or automatically re-transmitted on the same or other wavelength. (B.S.204 Supp. No. 3 No. 12108) (see B.S.204, No. 6525).

[This definition was introduced for logical completeness. It is not expected that this concept will be encountered in ordinary descriptive writing or speech, hence the cumbersome nature of the term is believed to be unimportant.]

**109. Radio range-finding**

Radiolocation in which the distance of an object is determined by means of its radio emission, whether independent, reflected, or re-transmitted on the same or other wavelength. (B.S.204 Supp. No. 3 No. 12109).

[Only the 'R' branch (see Fig. 1) is practicable at present but the definition must take account of future possibilities.]

**110. Isochrone determination**

Radiolocation in which a position-line is determined by the difference in the transit times of signals along two paths. (B.S.204 Supp. No. 3 No. 12111) (see 'Isochrone' No. 285 in this publication).

[It was desired to include all forms of position-line determination depending upon an *observed difference* in time of arrival at a receiver of interrelated signals which have travelled by two paths.]

**111. Radio direction-finding**

Radiolocation in which only the direction of an object is determined by means of its own independent emissions. (B.S.204 Supp. No. 3 No. 12112) (see B.S.204, No. 6507).

[It was particularly desired to limit the term 'Direction finding' to the older practice of ascertaining the direction of a source of signals independent of the direction-finding station (i.e. to exclude use of reflected or re-transmitted waves). This limitation is required solely for practical convenience.]

**112. Radar**

The use of radio waves, reflected or automatically re-transmitted, to gain information concerning a distant object. In the case of automatic re-transmission, the delay in evoking the re-transmission must be sufficiently short and precise for the range to be measurable.

*Note:*—In *Primary radar* the object only reflects the incident radiation. In *Secondary radar* the responding object is caused automatically to re-transmit on the same or other wavelength. (B.S.204 Supp. No. 3 No. 12113).

[This definition excludes any device in which, for example, a distant transmitter is automatically started by the questioning station, and, after a considerable time-interval, sends signals back to the station which initiated the action. Any of the 'R' branches (see Fig. 1) of Radiolocation is Radar.]

**113. Radio navigation**

The use of radio waves in navigation for the determination of position or direction, or for obstruction warning. (B.S.204 Supp. No. 3 No. 12114).

[This definition includes the 'D' branches (see Fig. 1) of Radiolocation, together with Radio communication, and Radar, all of which can contribute to Radio navigation.]

**SECTION 2—AERIALS AND PROPAGATION**

**201. Aerial**

That part of a radio transmitting system from which electromagnetic waves are radiated into space. This includes any device for directing the radiation, but does not include the transmission line or guide to the *primary radiating elements*.

**202. Aerial system**

The assembly of *aerial* and the electrical and mechanical devices for supporting, insulating and/or rotating it.

**203. Aerial array**

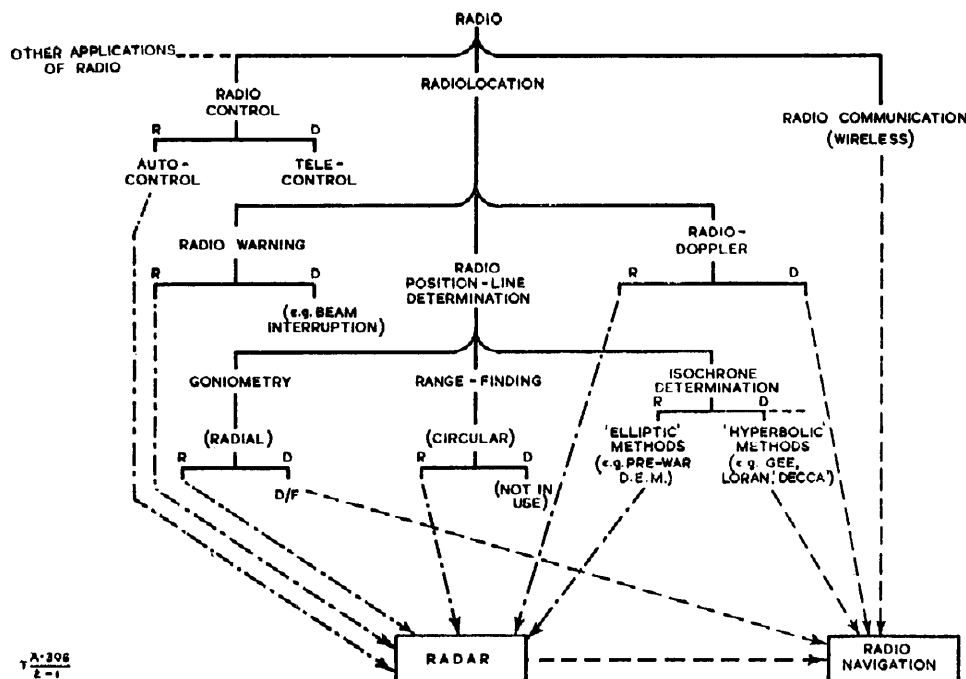
Array  
Beam aerial

An ordered assembly of elements spaced and fed in such a manner that the radiation is concentrated in one or more directions.

**204. Primary radiating element**

Primary radiator

One element of an *aerial* at which radiated energy leaves the transmission system.



**NOTES**

'R' IMPLIES USE OF REFLECTED OR AUTOMATICALLY RETRANSMITTED WAVES

'D' IMPLIES USE OF DIRECT OR INDEPENDENT TRANSMISSION, INCLUDING TRANSMISSION VIA THE IONOSPHERE

Fig. 1—Fundamental concepts of RADIO

**205. Passive element**

Parasitic element (deprecated)

An aerial element energized only by radiation which it receives from one or more primary elements.

**206. Director element**

Director

A passive element so situated with respect to its associated primary element(s) that the direction of the maximum radiation from the primary radiating element is the same as the direction from the primary element(s) to the passive element.

**207. Reflector element**

Reflector

Mirror

A passive element so situated with respect to its associated primary element(s) that the direction of the maximum radiation from the aerial is opposite to the direction from the primary element(s) to the passive element.

Note: 201 to 207 form a self-consistent group of concepts, four of which have been defined by B.S.I. as under.

**(a) Aerial (Compare 201)**

Antenna

That part of the radio-transmission system from which energy is radiated into space. This includes any device for directing the radiation, but does not include the transmission line or waveguide to the radiator. Cf. BS.204, No. 4201 (BS.204. Supp. No. 1 No. 1101).

**(b) Aerial array (Compare 203)**

Beam aerial

An ordered assembly of elementary aeriels spaced and fed in such a manner that the resulting radiation is concentrated in one or more directions. Cf. BS.204 No. 4209 (BS.204 Supp. No. 1 No. 1102).

**(c) Primary radiator (Compare 204)**

The portion of the aerial system from which energy leaves the transmission system, the distribution being subsequently modified by the rest of the system. (BS.204 Supp. No. 1 No. 1105).

**(d) Reflector (Compare 207)**

Mirror

One or more conductors or conducting surfaces so shaped as to reflect the energy from, and to modify the radiation pattern of, a primary radiator or array. Cf. BS.204, No. 4214 (BS.204 Supp. No. 1 No. 1107).

**208. Elementary aerial**

Radiating element (deprecated)

A radiating constituent of an aerial array. (BS.204 Supp. No. 1 No. 1103).

**209. Rod mirror**

Rod reflector

A system of parallel rods so dimensioned and spaced as to act substantially as a continuous reflecting surface (see BS.204 Supp. No. 1 No. 1108).

**210. Dish**

A reflector the surface of which is part of a sphere or of a paraboloid of revolution. (BS.204 Supp. No. 1 No. 2603).

**211. Cut paraboloid**

Cut-back paraboloid (deprecated)

The part of a paraboloid which remains when the parts lying outside one or more pairs of parallel planes are missing, the planes of each pair being on opposite sides of the axis and equidistant from it.

**212. Cheese**

A reflecting surface which is formed by part of a cylinder bounded by parallel plates perpendicular to the axis of the cylinder. (BS.204 Supp. No. 1 No. 2602).

**213. Stack**

A vertical or substantially vertical array of aerial elements. (BS.204 No. 4212).

**214. Rhombic aerial**

A directive aerial consisting of wires, long compared with the wavelength, forming the sides of a rhombus, often terminated at the end nearer the distant station by a resistor equal to the characteristic impedance of the aerial measured at that point.

**215. Whip aerial**

A type of aerial consisting of a flexible rod supported at one end.

**216. Turnstile aerial**

An aerial consisting of crossed linear elements which are so excited as to radiate equally in all directions in the plane of the aerial.

**217. Folded dipole**

A primary radiating element consisting of two parallel dipoles, separated by a small fraction of the wavelength, connected together at their outer ends, and fed at the centre of one dipole.

**218. Terminated folded dipole**

A folded dipole having a resistor, equal in value to the average characteristic impedance of the aerial connected across those inner ends which are not fed.

**\*219. Slot radiator**

A slot in the wall of a waveguide or horn to act as a primary radiator (BS.204 Supp. No. 1 No. 2614).

**220. Slot aerial**

An aerial formed by slot radiators.

**\*221. Dumb-bell slot**

A dumb-bell shaped hole acting as a slot radiator (BS.204 Supp. No. 1 No. 2615, see also No. 364 in this publication).

**222. Aperture**

(a) The open end of a horn, reflector or similar item.

(b) A significant linear dimension of (a). (BS.204 Supp. No. 1 No. 2601).

**\*223. Vertex plate**

A plate placed near the vertex of a reflector to prevent undesired reflection back to the primary radiator. (BS.204 Supp. No. 1 No. 2604).

**\*224. Horn**

Flare

An elementary aerial consisting of a waveguide in which one or both transverse dimensions increase towards the aperture. (BS.204 Supp. No. 1 No. 2605).

**225. Throat**

That part of the horn or tapered parallel plate guide immediately adjacent to and connected to the main run of a waveguide. (BS.204 Supp. No. 1 No. 2606).

**\*226. Hoghorn**

An elementary aerial the essential feature of which is the smooth transition from a waveguide to a cheese, with an asymmetrical feed. (BS.204 Supp. No. 1 No. 2607).

**\*227. Nozzle**

Spout

An elementary aerial consisting of a waveguide in which neither transverse dimension is increased, but either or both may decrease towards the aperture. (BS.204 Supp. No. 1 No. 2608).

**228. Dielectric radiator**

A radiator composed of a dielectric. (BS.204 Supp. No. 1 No. 2609).

**\*229. Dielectric rod-radiator**

Polyrod (deprecated)

A form of dielectric radiator with 'end-fire' directive properties (for 'end-fire' see BS.204 No. 4211) (BS.204 Supp. No. 1 No. 2610).

**\*230. Dielectric lens**

A lens, as in optics, made of dielectric material and used for refraction of radio-frequency energy. (BS.204 Supp. No. 1 No. 2611).

**231. Parallel-plate guide**

A region bounded by two parallel plates in which electromagnetic energy can be propagated. (BS.204 Supp. No. 1 No. 2612).

**232. Waveguide lens**

A lens in which the required phase-changes result from transmission through suitable waveguide elements. (BS.204 Supp. No. 1 No. 2613).

**233. Rolled throat****Rolled-plate scanner**

A *parallel-plate guide* system in which the bounding sheets are rolled or bent in such a way that a circular motion of the source or *primary radiating element* is converted into angular movement of the wavefront in one plane only.

**234. Cutler feed**

A *primary radiating element* in which a rectangular waveguide projects through the apex of a *mirror* towards the focus, at or near which it branches symmetrically into two guides of smaller *non-critical dimensions*, which then bend outwards and back towards the *mirror* and terminate in two radiating apertures on each side of the feed guide.

**\*235. Corner reflector**

A *reflector* consisting of intersecting flat surfaces, so disposed as to reflect incident waves parallel to their direction of incidence. (BSI).

**\*236. Corner aerial****Corner-reflector aerial (deprecated)**

A directive aerial consisting of an *aerial* or *aerial array* situated within the angle formed by two plane reflecting surfaces.

*Note:* The alternative term is deprecated because the device is not an aerial in a 'corner reflector' as defined in No. 235 above. (BSI).

**237. Radome**

A weatherproof cover for a *primary radiator* or *aerial system*, and transparent to radio-frequency energy (BS.204 Supp. No. 1 No. 1106).

**238. Equi-signal surface**

A surface around an *aerial* formed by all points at which, for transmission, the field strength (usually measured in volts per metre) is constant.

**239. Field-strength diagram**

A representation of the field strength at a constant distance from an *aerial*

**240. Horizontal field-strength diagram**

A representation of the field strength at a constant distance from an *aerial* and in a horizontal plane. Unless otherwise specified, this plane is that passing through the *aerial*.

**241. Vertical field-strength diagram**

A representation of the field strength at a constant distance from an *aerial*, and in a vertical plane passing through the *aerial*.

**242. Polar diagram**

A mathematical term for a diagram using polar co-ordinates. Its colloquial unqualified use is deprecated.

**243. Coverage diagram****Service-area diagram**

A diagram showing the areas (in the horizontal or vertical plane) within which a radio installation is effective to a given standard.

**244. Front-to-back ratio**

The ratio of the field strength of an *aerial* or *array* in the desired direction to its maximum field strength in the rear sector.

**245. Back-to-front ratio****(In D.F.)**

The ratio of the signal voltage on the reciprocal bearing to that on the correct bearing.

**246. Squint**

The small angle which may exist between the normal to the plane of a broadside *array* (or the axis of an 'end-fire' array) and the direction of maximum radiation. (BS.204 Supp. No. 1 No. 1109).

**247. Lobe**

- (a) The portion of a *field-strength diagram* within a solid angle bounded by a region or regions of minimum radiation.
- (b) The cross-section of a lobe as defined in (a) by any specified plane.
- (c) The radiation of electro-magnetic energy corresponding to the field-strength distribution represented as in (a) or (b).

**248. Main lobe**

The most important *lobe*

**249. Side lobe**

A *lobe* additional to the *main lobe*

**250. Gap**

Part of the region, between the axes of two *lobes* in the *field-strength diagram* of a radio set, in which the field strength drops below an effective value.

**251. Gap filling**

The electrical or mechanical rearrangement of an *aerial array*, or the use of a supplementary *array* to produce *lobes* where *gaps* previously occurred.

**\*252. Beam**

A radiation of electro-magnetic energy restricted mainly to a small solid angle (see para. 6). (BSI).

**253. Beam width**

The angular width of a *beam*, at a sufficiently large distance from the *transmitter*, measured between the directions in which the power intensity is half the maximum.

**254. Fan beam**

A *beam* whose angular width is much greater in one plane than in the perpendicular plane, the line of intersection of the two planes being the axis of the *beam*.

**255. Beavertail beam**

A *fan beam* whose horizontal width is greater than its vertical width.

**\*256. V-beam system**

A radar system employing an aerial arrangement in which two fan-shaped *beams*, one vertical and the other inclined, intersect at ground level. In the V-beam system of measuring elevation, the *aerial system* rotates continuously about a vertical axis. The time elapsing between the receipt of *echoes* from the two *beams* from an object is a measure of its elevation. (BSI).

**\*257. Cosecant-squared beam**

A narrow vertical fan-shaped *beam* with its direction of maximum intensity horizontal, and such that its intensity in any direction within a certain angular range is proportional to the square of the cosecant of the angle above or below the horizontal plane through the origin of the *beam*.

*Note:* This form of beam, used with a radar set, gives approximately uniform signal intensity for *echoes* received from near and distant objects in any other horizontal plane within the beam direction. (BSI).

**\*258. Beam switching**

- Split (deprecated)
- Aerial switching (deprecated)
- Lobe switching (deprecated)
- Lobe swinging (deprecated)
- Lobing (deprecated)

A method of determining the direction of a remote object by comparison of the signals corresponding to two or more successive *beam angles*, differing slightly from the direction of the object. Beam switching may be either:

- (a) continuous and periodic or
- (b) discontinuous. (BSI).

**\*259. Scan**

In radio: To explore a region by the automatic continuous variation of the direction of a *beam*.

**\*260. Search**

To explore a region by manual variation of the direction of a *beam*. (BSI).

**261. Scanner**

Those parts of the *aerial* which, moving, cause the *beam* to *scan*.

**\*262. Electrical scanning**

Scanning where the required variations of *beam* direction are produced by variations in phase and/or amplitude of the currents in the *primary radiating elements*.

**\*263. Sector scanning**

*Scanning* through a limited plane angle about any desired axis. (BSI).

**264. Conical scan**

A conical motion of the axis of a *beam* by which improved angular accuracy is obtained by comparison of the signal amplitudes at various points during the cycle. (BSI).

**265. Spinner**

That part of a mechanical *scanner* which rotates about an axis, most generally restricted to cases where the speed of rotation is relatively high.

**266. Crank**

A form of *spinner* in which the *flare* is offset from the axis of rotation.

**\*267. Automatic range, bearing or elevation measurement**

The automatic determination of range, bearing or elevation of an object by a mechanism actuated by the *echo* signal. (BSI).

**\*268. Automatic aiming**

A system in which a mechanism actuated by the *echo* signal automatically keeps the radar *beam* pointing at a moving object. (BSI).

**\*269. Automatic following**

Automatic aiming with the addition of automatic range measurement.

*Note:* The use of the term automatic following to mean automatic aiming is deprecated. (BSI).

**270. Super-high frequency (S.H.F.)**

Super-frequency (deprecated)

A frequency greater than 3kMc/s (3,000Mc/s).

*Note:* Owing to the difficulties attending the use of these superlative adjectives in descriptive names for frequencies, it is recommended that the descriptive terms for wavelength groups (see Nos. 271 to 277 in this publication) to be used when it is desired to refer in this general way to electro-magnetic waves.

**271. Millimetre waves**

Waves from 1—10 mm. long.

**272. Centimetre waves**

Centimetric waves (deprecated)

Waves from 1—10 cm. long.

**273. Decimetre waves**

Waves from 1—10 dm. long. (10—100 cm.)

**274. Metre waves**

Metric waves (deprecated)

Waves from 1—10 m. long.

**275. Short waves (S.W.)**

Waves from 10—100 m. long.

**276. Medium waves (M.W.)**

Waves from 100—1,000 m. long.

**277. Long waves (L.W.)**

Waves longer than 1,000 m.

**278. Spot frequency**

A pre-selected single frequency.

**\*279. Critical frequency**

The frequency of the highest-frequency wave which is returned to earth, from a particular ionospheric layer at a particular time and place; transmission being at vertical incidence.

*Note:* The ordinary and extraordinary waves have different critical frequencies. The term critical frequency when applied without specific qualification generally means the critical frequency of the ordinary wave. (B.S. 204 Supp. No. 2 No. 10117) (see No. 313 in this publication).

**280. Zero-skip frequency (Z.S.F.)**

The highest critical frequency (see No. 279 in this publication).

**281. Ground wave**

A wave which travels virtually along the ground in a manner primarily determined by the electrical constants of the ground. (B.S.204, No. 6405).

**\*282. Ground wave (Radar)**

(a) The direct transference of radio-frequency energy from a radar transmitter to its associated receiver.

(b) The term is also used to describe the effect on the display of the transference of energy from the associated transmitter. (BSI).

**\*283. Maximum usable frequency (M.U.F.)**

The highest frequency for propagation by ionospheric reflection of radio waves between two specified points at a particular time.

*Note 1:* The maximum usable frequency for a single hop is the product of the critical frequency at the centre of the hop and the maximum usable frequency factor for the distance concerned.

*Note 2:* The maximum usable frequency for a path between two specified points involving more than one hop is usually taken as the lowest of the M.U.F.'s existing for the separate single hops. (B.S.204 Supp. No. 2 No. 10118).

**\*284. Optimum working frequency**

The highest frequency at which propagation between two specified points can be expected to be maintained regularly in undisturbed conditions at a certain time on each day.

*Note:* The optimum working frequency is determined on a statistical basis, allowing for the expected variations of the *maximum usable frequency* for a given time on each day during the period concerned. (B.S. 204 Supp. No. 2 No. 10120).

**\*285. Isochrone**

A line (on a map or chart) joining points associated with a constant time difference in reception of radio signals.

*Note:* Isochrones may be, for example, families of confocal ellipses or hyperbolae, depending on the arrangement of transmitters or receivers. (B.S.204 Supp. No. 3 No. 12110).

**\*286. Skip area**

For a given frequency; the area, not necessarily circular, around a given point on the earth's surface swept by a complete rotation of a radius vector equal in length to the skip distance. (B.S.204 Supp. No. 2 No. 10126).

**\*287. Silent zone**

Skip zone

For a given *sender*, at a given point; the zone, the outer boundary of which is coincident with that of the *skip area*, and the inner boundary of which is the locus of the end of a radius vector equal in length to the maximum distance for *ground-wave* propagation from that *sender*. It is the region in relation to a given *sender* in which no signal would be expected, either due to *ground waves* or by reflection by regular layers of the ionosphere.

*Note:* Reception within the silent zone may occur owing to scattering, localised reflection, or some abnormal means of propagation. (B.S.204 Supp. No. 2 No. 10127).

**\*288. Shadow region**

Shadow area (deprecated)

Blind area (deprecated)

Risk area (deprecated)

The region in which, under normal propagation conditions the received field strength is reduced by some obstruction which renders effective reception of signals, or radar detection of objects in this region, improbable. (BSI).

**\*289. Confusion region**

The region surrounding an object within which the radar echo from that object cannot be resolved from other echoes. (BSI).

**\*290. Super-refraction (see Fig. 2)**

Guided propagation

Anomalous propagation (deprecated)

Refraction by the atmosphere exceeding that which would occur in a standard radio atmosphere. (B.S.204 Supp. No. 2 No. 11109).

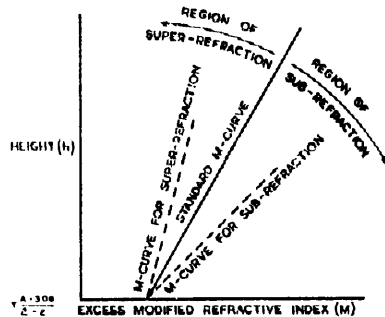


Fig. 2 - Regions of refraction

**291. Dot-lock**

Lock-dot

A method in which a direction finder is operated by only the very first part, or other desired part, of the signal arriving at the receiving station at each morse dot or dash, components of signal due to all rays arriving earlier or later being eliminated.

**292. W/T (Wireless telegraphy)**

Type A1 or A2 waves.

**293. R/T (Radio telephony)**

Type A3 waves.

**\*294. F.M. Radar**

A form of radar in which the radiated wave is frequency modulated and the returning echo beats with the wave being radiated, enabling the range to be measured. (BSI).

**\*295. Radar camouflage**

The art of concealing the presence or the nature of an object from radar detection.

Note: One method consists of devising coverings or surfaces which considerably reduce the radio energy reflected towards the radar set. (BSI).

**SECTION 3—WAVEGUIDE TECHNIQUE****Sub-section (a)—Fundamental terms****\*301. Mode**

Any possible field configuration in a guided or bounded progressive or stationary wave. (B.S. 204 Supp. No. 1 No. 2101).

**302. Fundamental mode**

Dominant mode

Of a waveguide; the mode with the lowest critical frequency. (B.S. 204 Supp. No. 1 No. 2102).

**303. H or TE mode**

Transverse electric mode

The type of mode in which the longitudinal component of the electric field is zero everywhere and the longitudinal component of the magnetic field is not. (B.S.204 Supp. No. 1 No. 2103).

**304.  $H_{mn}$  or  $TE_{mn}$  mode**

(a) In a rectangular waveguide; the subscripts  $m$  and  $n$  denote the number of half-period variations in the electric field parallel to the short and long sides respectively of the guide.

(b) In a circular waveguide; the type of mode which has  $m$  diametral planes in which  $H$  (the longitudinal component of the magnetic field) is zero, and  $n$  cylindrical surfaces of finite radii  $r$  at which  $dH/dr$  is zero. (B.S.204 Supp. No. 1 No. 2104).

**305. E or TM mode**

Transverse magnetic mode

The type of mode in which the longitudinal component of the magnetic field is everywhere zero and the longitudinal component of the electric field is not. (B.S.204 Supp. No. 1 No. 2105).

**306.  $E_{mn}$  or  $TM_{mn}$  mode**

(a) In a rectangular waveguide; The subscripts  $m$  and  $n$  denote the number of half-period variations in the magnetic field parallel to the short and long sides respectively of the guide.

(b) In a circular waveguide; the type of mode which has  $m$  diametral planes and  $n$  cylindrical surfaces of finite radii (including the wall of the guide) at which the longitudinal component of the electrical field is zero. (B.S.204 Supp. No. 1 No. 2106).

**307. TEM mode**

Transverse electric and magnetic mode

The type of mode in which the longitudinal components of the electric and magnetic fields are everywhere zero. (B.S.204 Supp. No. 1 No. 2107).

**\*308. Evanescent mode**

The mode of oscillation in a cut-off (evanescent) waveguide, i.e., the mode in which the amplitude diminishes along the waveguide without change of phase. (B.S.204 Supp. No. 1 No. 2108).

**309. Septate mode**

A waveguide mode which can be propagated along a septate waveguide.

**\*310. Direction of polarization**

In waveguides:—

(a) The direction of the electric intensity.

(b) For a mode possessing at any cross-section two and only two axes of symmetry at right angles, the direction of the electric intensity at, or limitingly near, the intersection of the axes. (B.S.204 Supp. No. 1 No. 2109).

**311. Critical dimension**

Resonant dimension (deprecated)

That dimension of the cross-section of a waveguide which determines the critical frequency. (B.S.204 Supp. No. 1 No. 2110).

**312. Non-critical dimension**

Non-resonant dimension (deprecated)

Any dimension of the cross-section of a waveguide which can be varied without causing alteration of the critical frequency or wavelength. (B.S.204 Supp. No. 1 No. 2111).

**313. Critical frequency**

Of a waveguide; That frequency below which a travelling wave in a given mode cannot be maintained. (B.S.204 Supp. No. 1 No. 2112).

**314. Critical wavelength**

The free-space wavelength corresponding to the critical frequency (see No. 313 in this publication) (B.S.204 Supp. No. 1 No. 2113).

**315. Guide wavelength**

The wavelength in a waveguide. (B.S.204 Supp. No. 1 No. 2114).

**316. Impedance**

(In waveguide technique)

Characteristic impedance

No single definition strictly analogous to transmission line technique exists; accepted alternative definitions applicable to  $H_{10}$  in rectangular waveguide are:—

(a) The ratio of maximum voltage to total longitudinal current.

(b) The ratio of twice the power to the square of the total longitudinal current.

(c) The ratio of the square of the maximum voltage to twice the power.

**317. Wave impedance**

The ratio of the transverse electric field to the transverse magnetic field. (B.S.204 Supp. No. 1 No. 2115).

**\*318. Normalized Impedance**

$(1+\rho)/(1-\rho)$  where  $\rho$  is the reflection coefficient at the cross-section in question. It can be considered as the ratio of an impedance to the characteristic impedance of the transmission line or waveguide at a cross-section. (B.S.204 Supp. No. 1. No. 2116).

**\*319. Reactance, inductive or capacitive**

Of a waveguide component: Characteristics comparable, in respect of the relation to reflection, with the inductance and capacitance of components connected to transmission lines. (B.S.204 Supp. No. 1 No. 2117).



**\*320. Coupling factor**

In a waveguide circuit; the ratio of the change of *impedance* in a primary waveguide (caused by coupling to a secondary system) to the *impedance* of that secondary system. (B.S.204 Supp. No. 1 No. 2118).

**\*321. Travelling wave**

In a waveguide circuit; the field configuration corresponding to the transmission of energy in one longitudinal (or axial) direction only. (B.S.204 Supp. No. 1 No. 2119).

**\*322. Standing wave**

Stationary wave

The field configuration in a waveguide due to the combination of a *travelling wave* and its reflections. (B.S.204 Supp. No. 1 No. 2120).

**323. Standing-wave ratio S.W.R.**

The ratio of the difference to the sum of the amplitudes of the direct and reflected waves at a point on a transmission line or in a waveguide (see Note to No. 324 in this publication).

**324. Voltage standing-wave ratio (V.S.W.R.)**

In a waveguide: The ratio of the amplitude of the electric field at a voltage minimum to that at an adjacent maximum. *Note:* The use of the term for the reciprocal of this ratio is deprecated. (B.S.204 Supp. No. 1 No. 2121).

**325. Aperture illumination**

The distribution of field strength of an electromagnetic wave over the area of an *aperture*. (B.S.204 Supp. No. 1 No. 2122).

**\*326. Gabling**

A form of *aperture illumination* wherein the field strength across a specified dimension increases continuously from the edge to the centre. (B.S.204 Supp. No. 1 No. 2123).

## Sub-section (b)—Waveguides

**\*327. Waveguide**

An elongated volume of air or other dielectric, bounded along its length by one or more surfaces which may be conducting or may be surfaces of discontinuity of permittivity and/or permeability; used for guided transmission of electric waves. Usually restricted to a rectangular or circular metal tube, of such dimensions that energy at the desired frequency can be propagated. (see B.S.204, No. 4222) (B.S.204 Supp. No. 1 No. 2201).

**328. Cut-off waveguide**

Evanescent waveguide

A waveguide used at a frequency below its *critical frequency*: i.e., operating in an *evanescent mode*. (B.S.204 Supp. No. 1 No. 2202).

**329. Dumb-bell waveguide**

A waveguide, the cross-section of which is shaped like a dumb-bell. (B.S.204 Supp. No. 1 No. 2203).

**330. Septum**

A longitudinal metallic plate inside a waveguide or transmission line.

**\*331. Septate waveguide**

A waveguide containing one or more *septa* or fins, e.g., two coaxial cylinders with a *septum* or fin extending radially from the inner to the outer cylinder along the entire length. The radius of the inner cylinder may be zero; the septate waveguide then consists of a tube with the radial fin along the entire length. (B.S.204 Supp. No. 1 No. 2204).

**332. Flexible waveguide**

A waveguide so constructed as to permit of bending and twisting without appreciable change in its electrical properties. (B.S.204 Supp. No. 1 No. 2205).

**333. Vertebrate waveguide**

A form of *flexible waveguide* consisting of a number of short sections of waveguide terminating in, and coupled to one another by *choked flanges*; these being held in an elastic tubular support. (B.S.204 Supp. No. 1 No. 2206).

**\*334. Bend**

A smooth change in the direction of the longitudinal axis of a waveguide. (B.S.204 Supp. No. 1 No. 2207).

**\*335. E bend**

A waveguide bent so that throughout the length of the *bend* the longitudinal axis of the guide remains in a plane parallel to the *direction of polarization*. (B.S.204 Supp. No. 1 No. 2208).

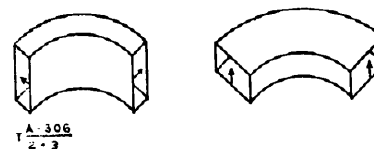


Fig. 3—E Bend H Bend

*Note:* Arrows show direction of polarization.

**336. H Bend**

A waveguide bent so that throughout the length of the *bend* the longitudinal axis of the guide remains in a plane which is perpendicular to that containing the *direction of polarization*. (B.S.204 Supp. No. 1 No. 2209).

**337. Edgewise bend**

Major bend

A rectangular waveguide bent so that throughout the length of the *bend* a longitudinal axis of the guide remains in a plane which is parallel to the wide side of the waveguide. (B.S.204 Supp. No. 1 No. 2210).

**338. Flatwise bend**

Minor bend

A rectangular waveguide bent so that throughout the length of the *bend* a longitudinal axis of the guide lies in one plane which is parallel to the narrow side of the waveguide. (B.S.204 Supp. No. 1 No. 2211).

**\*339. Corner**

Elbow

An abrupt change in the direction of the longitudinal axis of a waveguide. (B.S.204 Supp. No. 1 No. 2212).

**340. Twist**

In a waveguide circuit: A progressive rotation of the cross-section of the waveguide about the longitudinal axis. (B.S.204 Supp. No. 1 No. 2213).

**341. Taper**

A continuous change of cross-section of a waveguide. (B.S.204 Supp. No. 1 No. 2214).

**342. Termination**

(In waveguide technique)

The point at which energy flowing along a waveguide continues in a non-waveguide form.

**343. Matched termination**

Non-reflecting termination

A termination to a line or waveguide transmission system which does not reflect any energy. (B.S.204 Supp. No. 1 No. 1104).

## Sub-section (c)—Mechanical accessories

**344. Connector**

In a waveguide circuit: The means for making a mechanical joint between the parts of a waveguide system. (B.S.204 Supp. No. 1 No. 2301).

**345. Flanged connector**

A mechanical joint in a waveguide, employing flanges in contact. (B.S.204 Supp. No. 1 No. 2302).

**346. Waveguide shim**

A thin resilient metal sheet inserted between waveguide components to ensure electrical continuity. (B.S.204 Supp. No. 1 No. 2303).

**347. Waveguide gasket**

A gasket, as used in engineering practice but which also maintains electrical continuity. (B.S.204 Supp. No. 1 No. 2304).

**348. Seal**

In a waveguide: A gas or water-tight insertion or covering designed to present no obstruction to radio-frequency energy. (B.S.204 Supp. No. 1 No. 2305).

**349. Ditch**

A groove correctly proportioned to act as a choke. (B.S.204 Supp. No. 1 No. 2306).

**\*350. Skirt**

The thin outer wall of a *ditch* built round the end of a waveguide or horn. (B.S.204 Supp. No. 1 No. 2307).

**\*351. Waveguide switch**

A device in a waveguide system for stopping or diverting the flow of high-frequency energy (B.S.204 Supp. No. 1 No. 2308).

**352. Stub support**

A stub used for mechanical support and normally designed to cause minimum electrical disturbance. (B.S.204 Supp. No. 1 No. 2309).

**Sub-section (d)—Coupling and mode-changing devices****\*353. Coupling**

In a waveguide circuit: The linkage between two lengths of waveguide, or between a waveguide and a component, essential to the transmission of radio-frequency energy. (B.S.204 Supp. No. 1 No. 2401).

**\*354. Choke**

In a waveguide circuit: A discontinuity in a waveguide surface, so shaped and dimensioned as to impede the passage of guided waves within a limited frequency range. (B.S.204 Supp. No. 1 No. 2402).

**\*355. Choke coupling**

A coupling between two parts of a waveguide system which are not in direct mechanical contact with each other; the coupling being so designed as to prevent leakage of radio-frequency energy. (B.S.204 Supp. No. 1 No. 2403).

**\*356. Choked flange**

A flange in the surface of which is cut a *ditch* so shaped and dimensioned as to impede the passage over its surface of guided waves within a limited frequency range. (B.S.204 Supp. No. 1 No. 2404).

**\*357. Coupling loop**

A device in the form of loop of wire for radio-frequency coupling. (B.S.204 Supp. No. 1 No. 2405)

**\*358. Directional coupler****Directive feed**

A coupling between a plurality of waveguides, so designed as to guide energy along selected paths by the effect of phase differences between wave components. (B.S.204 Supp. No. 1 No. 2406).

**\*359. Flange coupling**

A coupling with flanges not in mechanical contact. (B.S.204 Supp. No. 1 No. 2407).

**\*360. Flexible coupling**

A coupling designed to allow a limited angular movement between the axis of two waveguides. (B.S.204 Supp. No. 1 No. 2408).

**\*361. Window**

A hole for coupling a cavity or waveguide to another cavity or waveguide. (B.S.204 Supp. No. 1 No. 2409).

**\*362. Diaphragm**

In a waveguide circuit: A thin plate or plates of conducting material occupying part of the cross-section of a waveguide. (B.S.204 Supp. No. 1 No. 2410).

**363. Resonant diaphragm**

A *diaphragm* so proportioned as to introduce no reactive impedance at a specified frequency. (B.S.204 Supp. No. 1 No. 2411).

**364. Dumb-bell slot**

A dumb-bell shaped hole in a wall or *diaphragm* of a waveguide and designed to have the desired resonant properties. (B.S.204 Supp. No. 1 No. 2412) (see also No. 221 in this publication).

**365. Filter (Waveguide)**

A combination of waveguide components designed to favour or oppose certain frequency bands. (see B.S.204, No. 1512).

**366. Mode changer****Mode transformer**

A device for changing from one *mode* of guided propagation to another. (B.S.204 Supp. No. 1 No. 2413).

**367. Mode filter**

In a waveguide circuit: A combination of waveguide elements designed to discriminate between certain *modes* of propagation. (B.S.204 Supp. No. 1 No. 2414).

**368. Mode filter slot**

A *mode filter* in the form of a slot. (B.S.204 Supp. No. 1 No. 2415).

**369. Ring mode filter****Ring filter**

A *mode filter* in the form of a resonant metallic ring or rings. (B.S.204 Supp. No. 1 No. 2416).

**370. Diaphragm-ring mode filter****Diaphragm-ring filter**

A *mode filter* in the form of a ring-shaped *aperture* in a *diaphragm*. (B.S.204 Supp. No. 1 No. 2417).

**371. Rotating joint**

A joint between two waveguide elements such that relative rotation of the elements has no effect on the flow of energy along the waveguide. (B.S.204 Supp. No. 1 No. 2418).

**\*372. Door-knob transformer**

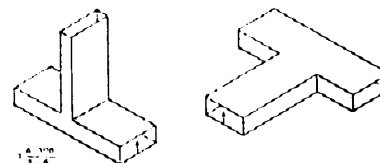
A *mode changer* for converting coaxial line transmission to rectilinear waveguide transmission. The outer of the coaxial line terminates in a circular *aperture* in one of the long sides of the waveguide and the inner traverses the waveguide with a progressive increase in diameter and terminates in the opposite side. (B.S.204 Supp. No. 1 No. 2419).

**373. Probe**

A conductor, normally a straight rod, projecting through, but normally insulated from, the wall of a waveguide, for the purpose of coupling to an external circuit. (B.S.204 Supp. No. 1 No. 2420).

**\*374. Series T**

A T-junction in which the *impedances* in the main waveguide and side arm are predominantly additive. (B.S.204 Supp. No. 1 No. 2422).

**Fig. 4 - Series T****Shunt T**

Note: Arrows show electric polarization.

**\*375. Shunt T**

A T-junction in which the admittances (reciprocal *impedances*) in the main waveguide and the side arm are predominantly additive. (B.S.204 Supp. No. 1 No. 2423).

**\*376. Hybrid T**

Branches in a waveguide system consisting of *series T* and *shunt T* junctions located at the same point in a waveguide and so designed as to restrict the passage of energy to certain specified paths. (B.S.204 Supp. No. 1 No. 2424).

**377. Ring switch**

A waveguide switch which embodies a resonant metallic ring or rings. (B.S.204 Supp. No. 1 No. 2425).

**378. Power divider**

A device to produce a desired distribution of power at a branch point in a waveguide system. (B.S.204 Supp. No. 1 No. 2426).

**379. Balance to unbalance transformer**

A device for matching a pair of lines, balanced with respect to earth, to a pair of lines not balanced with respect to earth.

**380. Balun**

Quarter-wavelength collar  
Bazooka (deprecated)

A *balance-to-unbalance transformer* for matching a balanced 2-wire line or dipole to a coaxial line, consisting of a quarter-wavelength coaxial shield around the outer conductor of the coaxial line and connected to it at the end remote from the junction of the lines.

*Note:* Also intended to include all similar arrangements of waveguide or coaxial-line elements for this purpose.

Sub-section (c) - **Adjusting and measuring devices****381. Iris**

An adjustable *diaphragm* or *window*. (B.S.204 Supp. No. 1 No. 2501).

**382. Tuning screw**

An *impedance-adjusting* element in the form of a rod passing through the wall of a waveguide or resonator and giving a depth of penetration adjustable by screwing. (B.S.204 Supp. No. 1 No. 2502).

**\*383. Non-dissipative stub**

In a waveguide circuit: A length of non-dissipative waveguide or coaxial line branched from the side of a waveguide and used to produce some desired change in its characteristics. (B.S.204 Supp. No. 1 No. 2503).

**384. Matching strip**

A conducting strip or rod connecting the opposite faces of a waveguide, used for impedance matching, and not in contact with the other faces. (B.S.204 Supp. No. 1 No. 2504).

**385. Matching plate**

A *diaphragm* used for *impedance* matching. (B.S. 204 Supp. No. 1 No. 2505).

**386. Matching pillar**

Matching post

A rod projecting from one interior face of a waveguide used for matching. (B.S.204 Supp. No. 1 No. 2506).

**387. Dielectric matching plate**

A plate of dielectric material used as an *impedance* transformer for matching purposes. (B.S.204 Supp. No. 1 No. 2507).

**388. Slug**

In a waveguide: A metallic or dielectric hollow cylinder inserted in a waveguide and forming part of a *transforming* section. (B.S.204 Supp. No. 1 No. 2508).

**389. Transforming section**

A length of waveguide or transmission line of modified cross-section, or with a metallic or dielectric insert, used for *impedance* transformation. (B.S.204 Supp. No. 1 No. 2509).

**390. Piston**

Plunger

A plate movable along a waveguide, acting as a short circuit for high-frequency currents. (B.S.204 Supp. No. 1 No. 2510).

**391. Contact piston**

A *piston* in which there is metallic continuity with the walls of the waveguide. (B.S.204 Supp. No. 1 No. 2511).

**392. Choke piston**

A *piston* in which there is no metallic contact with the walls of the waveguide at the edges of the reflecting surface; short-circuit to high frequency currents being achieved by a *choke* system. (B.S.204 Supp. No. 1 No. 2512).

**393. Squeeze section**

A length of waveguide so constructed as to permit alteration of the *critical dimension* with a corresponding alteration in the electrical length. (B.S.204 Supp. No. 1 No. 2513).

**394. Trombone**

In a waveguide circuit: A U-shaped length of waveguide of adjustable length. (B.S.204 Supp. No. 1 No. 2514).

**\*395. Phase-shifter**

Line-lengthener

A device for altering only the electrical length of a waveguide. (B.S.204 Supp. No. 1 No. 2515).

**\*396. Strip attenuator**

Flap attenuator

An *absorptive attenuator* in which the dissipative material has the form of a movable sheet. (B.S.204 Supp. No. 1 No. 2516).

**397. Cut-off attenuator**

A fixed or variable length of *cut-off waveguide* used to introduce non-dissipative attenuation. (B.S.204 Supp. No. 1 No. 2517).

**398. Piston attenuator**

A length of *cut-off waveguide* used to introduce fixed or variable non-dissipative attenuation by the movement of an output *coupling* device along its longitudinal axis.

*Note:* Called 'piston attenuator' because the attenuating device is usually carried on a sliding member like a piston. (B.S.204 Supp. No. 1 No. 2518).

**\*399. Absorptive attenuator**

In a waveguide: A length of waveguide designed to introduce a transmission loss by the use of some dissipative material. (B.S.204 Supp. No. 1 No. 2519).

**400. Pad**

In waveguides: An attenuator of fixed value. (B.S.204 Supp. No. 1 No. 2520).

**401. Wedge**

A termination comprising a tapered length of dissipative material introduced into the guide, e.g., carbon, water, or wood. (B.S.204 Supp. No. 1 No. 2521).

**402. Slotted measuring section**

A length of waveguide, in the wall of which there is a non-radiating slot for measuring purposes. (B.S.204 Supp. No. 1 No. 2522).

**403. Enthrakometer**

A resistance grid forming part of the wall of a waveguide and used for power measurement.

*Note:* Also used for a film similarly employed.

**SECTION 4—WAVEFORMS, CIRCUITS AND CIRCUIT COMPONENTS****501. Pulse**

A variation in the value of some quantity as a function of time such that the value departs from a given datum for a time interval and then returns to this datum for a much longer time interval.

**502. R.F. Pulse**

Pulse

A train of oscillations whose envelope has the form of a pulse.

**503. Pulsed-carrier modulation**

Pulse modulation

Modulation of a pulsed carrier.

**504. Pulse-amplitude modulation**

A form of *pulse modulation* in which intelligence is conveyed by varying the amplitude of successive *pulses*.

**505. Pulse-length modulation**

Pulse-duration modulation

Pulse-width modulation

A form of *pulse modulation* in which intelligence is conveyed by varying the duration of successive *pulses*.

**506. Pulse-position modulation**

Pulse-phase modulation

Pulse-time modulation

A form of *pulse modulation* in which intelligence is conveyed by varying the time interval by which successive *pulses* are displaced from their normal times of occurrence.

**507. Pulse-frequency modulation**

A form of *pulse modulation* in which intelligence is conveyed by varying the pulse-recurrence frequency.

**508. Double-pulse-position modulation**

A form of *pulse modulation* in which the *pulses* occur in pairs, and intelligence is conveyed by varying the spacing between the *pulses* of each pair. The first of each pair recurs regularly at equal intervals.

**509. Peak value****Peak**

The maximum instantaneous value attained by a wave form.

**510. To peak**

To adjust a tuned circuit to optimum performance.

**511. Peak-to-peak amplitude****Double peak amplitude****Swing (deprecated)**

The amplitude of an alternating quantity, measured from positive *peak* to negative *peak*.

**512. Mean pulse amplitude (for pulse transmitters)**

By a process of successive approximation a rectangle is drawn on the graph of a *pulse envelope*, with its base on the horizontal (time) axis, in such a way that its vertical sides are bisected by the *pulse envelope*, and that its area is equal to the area under the *pulse envelope*. The height of the rectangle is known as the mean pulse amplitude. (Based on the definition of the Radio Establishments Standard Practices Committee).

**513. Duty factor**

Mark-to-space ratio. (This is deprecated as a synonym for duty factor)

For a *pulse transmission*, the ratio (or its reciprocal) of the duration of the equivalent rectangular *pulse* to the *pulse recurrence period*.

**514. Coherent-pulse technique**

The use of recurrent *R.F. pulses* whose *R.F. oscillations* bear a constant phase relationship to those of a continuous oscillator (real or imaginary) as though the *R.F. pulses* had been derived from the continuous oscillator by suppressing its output during the intervals between the *R.F. pulses*.

**515. Wobulation**

Frequency modulation at a very low (normally sub-audio) frequency.

**516. Beat frequency**

The number of beats per second which results from combining two frequencies.

**517. Counting down****Sub-dividing****Frequency dividing (deprecated)**

The production of recurrent *pulses* whose repetition rate is a sub-multiple of that of the initiating *pulses*.

**518. Wide-band****Broad-band**

Having a wider frequency response than the normal type of circuit at the corresponding mid-band frequency.

**519. Two-band working**

Any system of working which uses a different frequency band for each of the two directions of transmission.

**520. Two-band amplifier****Two-band repeater**

An amplifier used in a *two-band working* circuit to amplify in both directions of transmission simultaneously.

**521. Zweil-band working**

The special type of *two-band working* in which one direction of transmission is at audio frequency.

*Note:* The terms two-wire working, four-wire working, two-wire repeater and four-wire repeater are already covered in B.S.204:1943 as follows:—

**(a) 1401. Two-wire circuit**

A circuit formed of two conductors insulated from each other.

**(b) 1402. Four-wire circuit**

A circuit using two pairs or channels so arranged that the electric waves are transmitted in one direction by one pair or channel, and in the other direction by the other pair or channel.

**(c) 1522. Two-wire amplifier****Two-wire repeater (deprecated)**

A telephone amplifier which provides for transmission in both directions over a two-wire telephone circuit.

**(d) 1523. Four-wire amplifier****Four-wire repeater (deprecated)**

A telephone amplifier for use in a four-wire circuit and in which there are two amplifiers, one serving to amplify the telephone currents in one channel of the four-wire circuit, and the other serving to amplify the telephone currents in the other channel.

**522. Scramble**

To transpose and/or invert bands of frequencies, or otherwise to modify the form of the intelligence, at the transmitting end according to a pre-arranged scheme, to obtain secrecy.

**523. Clip**

To remove that part of a waveform lying beyond a given limit.

**524. Slice**

To remove those parts of a waveform lying outside two given amplitude limits on the same side of the zero axis.

**525. Amplitude separation**

The process of separating parts of a waveform differing considerably in amplitude.

**526. D.C. restoration****D.C. re-establishment****Base-line stabilization****Peak-level stabilization**

Imposition on a recurrent waveform, of a steady potential, obtained by rectification of that waveform, of such a value, that the trough or crest of the waveform reaches a desired level.

**527. Clamp**

To fix at a desired level a given part of each cycle of a periodic electrical variation (without affecting the alternating components).

**528. Clamping switch**

A thermionic circuit device which, while it is in operation, imposes a predetermined potential on a point in the circuit.

**529. Noise**

Unwanted energy (or voltage produced) usually of random character, present in a transmission system, due to any causes.

*Note:* In particular applications of the term the noise may be limited to noise of specified origin. (B.S.204, No. 1322).

**530. Thermal noise****Johnson noise**

The e.m.f. generated by the thermal agitation of electrons.

**531. Signal-to-noise ratio**

The ratio of the available signal power to the available noise power.

**532. Noise factor (of a receiver)****Noise figure**

The ratio of the *signal-to-noise ratio* at the input to that at the output of a receiver, within limiting conditions.

**533. Equivalent noise temperature (of a component)****Noise temperature (deprecated)**

The absolute temperature at which a perfect resistor, of equal resistance to the component, would generate the same noise as does the component at room temperature.

**534. Noise-temperature ratio**

The ratio of the available noise power from the component to the available noise power from a perfect resistor at 290°K.

**535. Precipitation noise****Crepitation noise****Precipitation static**

Noise generated in an *aerial* circuit, generally in the form of a relaxation oscillation caused by the periodic discharge of the *aerial*, or conductors in the vicinity of the *aerial*, into the atmosphere.

**536. Transmitter**

Sender

The apparatus for the production and modulation of radio-frequency energy for the purpose of radio communication (see B.S.204, No. 4301).

**537. Transmitter-receiver**

A transmitter and a receiver combined in a unit.

**538. Transceiver**

A combined transmitter and receiver in which part of the R.F. circuit is used both for transmitting and receiving.

**539. Spectrometer**

Spectrum analyser

A test instrument to determine the frequency distribution of the energy generated by any source.

**540. Spectroscope**

A spectrometer which displays the relative amplitudes of the single-frequency components simultaneously.

**541. Panoramic receiver**

A receiver periodically traversing a part of the R.F. spectrum and displaying the amplitudes of receiver signals on a frequency scale.

**542. Aerial-isolating stage**

Aerial splitter (deprecated)

A device which allows a common aerial system to be used by two receivers simultaneously.

**543. Diplexer**

A device which allows a common aerial system to be used by two transmitters simultaneously.

**544. R.F. Head**

T.R. Box (deprecated)

That part of a radio equipment containing components concerned in the reception and transmission of carrier frequencies.

**545. Common T.R. working**

Duplexer (deprecated)

The use of a common aerial for transmitting and receiving radio signals.

**546. T.R. Switch**

Receiver protector

A device used to prevent energy reaching the receiver during transmission. It may be used in radar sets employing either separate or common transmitting and receiving aeriels.

**547. T.R. Unit**

T.R. box

A device which incorporates a T.R. switch and a transmitter blocker (if fitted). It is used only in sets employing a common transmitting and receiving aerial.

**548. Transmitter blocker**

A.T.R. switch (deprecated)

Anti-T.R. box (deprecated)

A device used to prevent received energy passing from the aerial to the transmitter.

**549. Preselector unit**

The signal-frequency resonant circuits with which may be associated an amplifying valve, preceding the frequency-changer of a superheterodyne receiver.

**550. Automatic frequency-control (A.F.C.)**

An arrangement whereby the frequency of an oscillator is automatically maintained in the neighbourhood of a desired value (see B.S.204, No. 4327).

**551. Automatic gain-control (A.G.C.)**

Automatic volume-control (deprecated)

A device, actuated by the received signal, which varies the over-all amplification of the receiver so as to maintain the output level for a given modulation depth substantially constant. (B.S.204, No. 4422).

**\*552. Anti-clutter gain control**

Swept gain

Temporal gain (deprecated)

A device which automatically and smoothly increases the gain of a radar receiver from a low level to the maximum, within a specified period after each transmitter pulse, so that short-range echoes producing clutter are amplified less than long-range echoes. (BSI).

**553. Automatic gain-stabilization**

Making the gain of a receiver independent of unwanted variations in circuit conditions.

**554. Noise suppression**

The action of a device which automatically suppresses the output of a radio receiver until a predetermined input-signal level has been reached (see B.S.204 No. 4424).

**555. Muting circuit**

Quiescent A.G.C. circuit

Squelch circuit (deprecated as a synonym)

(a) A circuit which cuts off the output of a receiver when no R.F. carrier greater than a predetermined intensity is reaching the first detector.

(b) A circuit for making a receiver insensitive during operation of its associated transmitter.

**556. Mixer**

A device containing a non-linear circuit element and associated with a beat oscillator, which delivers output at a frequency or frequencies differing from the input frequency (see B.S.204, No. 1517).

**557. Combiner**

Programme mixer

Mixer (deprecated as a synonym)

A linear circuit device for associating two or more A.C. inputs to produce a combined output.

**558. Frequency-changing circuit**

Frequency changer

Converter (deprecated)

A circuit, comprising a beat oscillator and a mixer, which delivers output at one or more frequencies differing from the input frequency.

**559. Local oscillator**

An oscillator, within the receiving equipment, used for generating oscillations which are combined with the incoming signal, as in beat reception.

**560. Crystal check-oscillator**

Crystal calibrator

A crystal-controlled oscillator incorporated in an equipment to provide a range of calibration frequencies.

**561. Crystal-controlled oscillator**

An oscillator, the frequency of which is determined by a piezo-electric crystal.

**562. Frequency synthesizer**

Synthesizer

A generator in which a desired frequency is obtained with precision by successive heterodyning of oscillations derived from one stable oscillator.

**563. Cathode-injection oscillator**

An oscillator in which the feedback voltage is injected into the cathode circuit of the maintaining valve(s).

**564. Spongy-lock oscillator**

A self-oscillator locked to a system liable to frequency fluctuation in such a way that the short-period frequency fluctuations of the system cause a negligible change in the oscillator frequency.

**565. Self-quenching oscillator**

An intermittent self-oscillator producing a series of short trains of R.F. oscillation separated by intervals of quiescence. The quiescence is caused by rectified oscillatory potentials building up in some part of the circuit to cut off the oscillations for a given period.

**566. Squegger**

A self-quenching oscillator in which the suppression occurs in the grid circuit.

**567. Blocking oscillator**

A *self-quenching oscillator* which becomes cut off before half a cycle of oscillation is completed.

**568. Grid blocking**

Paralysis of capacitance-coupled stages in an amplifier owing to the accumulation of charge on the *coupling condensers* due to grid current passed during the reception of large signals.

**569. Grid locking**

Blocking (strongly deprecated)

A defect of valve operation in which the grid potential becomes continuously positive owing to excessive grid emission.

**\*570. Anti-jitter circuit**

A valve circuit operated by unwanted voltage fluctuations of a D.C. supply to produce a stabilized voltage output for the reduction of jitter on a display. (BSI).

**571. Differentiating circuit**

A circuit whose output voltage is approximately proportional to the rate of change of the input voltage.

**572. Integrating circuit**

A circuit whose output voltage is approximately proportional to the time integral of the input voltage.

**573. Pulse-forming network or circuit**

A network or circuit which serves to produce a *pulse* of the required waveform.

**574. Pulse-shaping network or circuit**

A network or circuit which makes the waveform of a *pulse* applied to the network approach the desired form.

**575. Delay network**

Delay line

A network or transmission line designed to delay a signal for a certain time.

**576. Echelon circuit**

A circuit producing a progressive step wave from a set of  $n$  pulses, reverting to its initial state at the  $(n+1)$ th pulse. (Used in counting circuits).

**577. Trigger**

Fire

To cause a circuit to operate by applying an impulse to it.

**578. Firing circuit**

Triggering circuit

The circuit which provides the impulse in firing.

**579. Relaxation circuit**

A circuit arrangement, usually of valves, reactances and resistors, which has two states or conditions, one, both, or neither of which may be stable. The transient voltage produced by passing from one to the other, or the voltage in a state of rest, can be used in other circuits.

**580. Stable trigger circuit**

Trigger circuit

A *relaxation circuit* which has two stable conditions, and can be made to pass very rapidly from one to the other by applying a suitable triggering pulse or signal. The Eccles-Jordan circuit is an example of a trigger circuit.

**581. Flip-flop circuit**

Kipp relay (deprecated)

One-shot multivibrator (deprecated)

A *relaxation circuit* having one stable and one unstable condition. By applying a triggering pulse or signal it may be made to pass very rapidly into the unstable condition whence, after a certain time interval, it automatically returns to the stable condition.

**582. Multivibrator**

A *relaxation circuit* which has two unstable conditions and successively passes from one to the other as long as it is operating. The Abraham-Bloch multivibrator is an example.

**583. Transitron**

A valve circuit whose action depends on the negative 'transconductance' of the suppressor grid of a pentode with respect to the screen grid.

**584. Miller circuit**

A form of circuit in which the time-constant of a resistance-capacitance combination is multiplied by means of the Miller effect on the capacitance.

**585. Miller valve**

A valve in which the Miller effect is utilized to modify its input admittance.

**586. Phantastron**

A valve *relaxation circuit* of the *transitron* type in which the time-constant of the charging circuit is increased by the Miller effect, and the necessary feed-back for cyclic operation is obtained by means of a resistance in the cathode circuit.

**587. Cathode-follower**

A circuit in which the output load is included in the cathode circuit of a valve, and the input to the valve is applied between the grid and the remote end of the cathode load. (B.S.204, No. 1908).

**588. Floating paraphase**

See-saw circuit

Anode follower (deprecated)

An electrical circuit consisting of two impedances of the same order connected in series together with a valve, the control grid of which is connected to the common point of the two impedances. The free end of one of the impedances is joined to the anode of the valve, and the application of a potential difference between the free end of the other impedance and the valve cathode results in a substantially equal but opposite potential change at the anode of the valve.

**589. Dynatron**

A valve circuit which employs the negative resistance provided by secondary emission in a tetrode valve.

**590. Diode switch**

A diode which is made to act as a switch by the successive application of positive and negative biasing voltages to the anode (relative to the cathode), thereby allowing or preventing, respectively, the passage of other applied 'waveforms' within certain limits of voltage.

**591. Coincidence valve**

Gate valve

A valve which is operative only while two signal voltages, derived from two independent circuits, are applied simultaneously and separately to two separate electrodes.

**592. Grounded-grid-triode circuit**

Common-grid circuit

A circuit in which the input signal is applied to the cathode and the output is taken from the anode. The grid is at R.F. earth and serves as a screen between the input and output circuits.

**593. Regeneration**

Positive feedback.

**594. Gating**

The selection, of part of the signal or other waveform, generally in respect of time.

**595. Blanking**

The reverse of *gating*, i.e., the rejection of part of a signal, or other waveform, generally in respect of time.

**596. Anti-jamming (A.J.)**

Reducing the effects of intentional jamming.

**597. Net**

To tune the *transmitters* and receivers of a group of stations to a common frequency.

**598. Lock**

Lock-in (deprecated)

To couple two or more systems so that the recurrence frequency in one system is constrained to be equal to, or a multiple or sub-multiple of, the recurrence frequency in the other.

**599. Synchronize**

To adjust the periodicity of an electrical system so as to bear an integral relationship to the frequency of the periodic phenomenon under investigation.

**600. Stagger**

To adjust, in a regular (not random) manner, the values of a series of circuit quantities so that some or all of them differ slightly from the mean value of the whole series.

**601. Buffer stage**

A valve-coupled stage specially designed to prevent load fluctuations of subsequent stages from affecting the frequency or other characteristics of preceding stages (see B.S.204, No. 1527).

**602. Driver stage**

An amplifying valve stage preceding a power amplifier stage.

**603. Phase inverter**

A stage used to reverse the polarity of a signal.

**604. Butterfly circuit**

An electrically balanced circuit designed for covering a wide range of frequencies; the moving tuning element varies the inductance and capacitance simultaneously without the use of sliding contacts.

**605. Semi-butterfly circuit**

Unbalanced form of butterfly circuit.

**606. Marx circuit**

A voltage-multiplying circuit in which capacitors or networks are charged in parallel and discharged in series.

**607. Tail-eating connection**

The method of connecting two 4-wire terminating sets without balance networks.

**\*608. Echo box**

A cavity resonator, having small damping, energized by pulses of energy radiated from a nearby aerial or by a probe in a waveguide.

*Note:* The train of diminishing oscillations in the box, immediately following each pulse, is re-radiated to the radar receiver and is intended to provide an over-all test of the radar set, not including the aerial. (BSI).

**609. Radiogoniometer****Goniometer**

An instrument which, when coupled to a suitable fixed aerial system, permits the bearing of arriving waves to be determined by rotation of a movable part. (B.S.204, No. 6525).

**610. Swing (in D.F.)**

The arc through which the direction-finder (if rotating) or the goniometer search coil (in case of fixed aerial system) must be moved to permit the determination of a bearing. The swing is preferably expressed in the form of  $\pm$  half the arc defined above. (B.S.204, No. 6216).

**611. Decoupling network**

A network whose purpose is to isolate one part of the circuit from the effects of an impedance in a common source. This frequently takes the form of a decoupling resistor and capacitor suitably arranged.

**612. Coupling condenser****Blocking condenser**

A capacitor, connected between components or stages in a circuit, offering a small impedance to the signal which it is desired to pass but preventing the flow of D.C.

**613. By-pass condenser**

A capacitor used to provide a path of comparatively low impedance over a certain range of frequencies. (B.S.204, No. 1500).

**614. Trimming condenser**

A small adjustable capacitor connected in parallel with another capacitor to permit the combined capacitance to be adjusted. (B.S.204, No. 1555).

**615. Padding condenser****Tracking condenser**

A capacitor included in the local oscillator circuit of a superheterodyne receiver, the value of the capacitor being so chosen in relation of the

magnitudes of the other components of the oscillating circuit as to minimize the divergence from correct tracking. (B.S.204, No. 4514).

*Note:* The capacitor is usually connected in series with one of the ganged similar tuning capacitors.

**616. Buffer condenser**

The capacitor connected across the secondary winding of vibrator transformers to provide the correct time-constant.

**617. Dropping resistor**

A resistor inserted between a voltage supply and a valve electrode or other point, serving to reduce the potential of the latter.

**618. Bleeder**

A resistor connected across a voltage supply in order to draw a steady current.

**619. Stopper**

A resistor connected next to one of the electrodes of a valve to prevent unwanted self-oscillation.

**620. Screen suppression**

The application of a negative potential to the screen of a valve in order to render it inoperative, e.g., as in gating.

**621. Cut (crystal)**

The angular relationship between the major faces of a crystal plate and the major axes of the mother crystal.

**622. Overtone crystal**

A piezo-electric crystal driven directly at an integral multiple of its natural frequency.

**623. Activation (quartz crystal)**

Cleaning and edge-grinding processes to increase the activity of quartz crystals.

**624. Activity (crystal)**

The ability of piezo-electric crystals to oscillate.

**625. Ageing (quartz crystal)**

The formation of crystallites and deposits of foreign matter on the major faces of crystal plates, resulting in loss of activity.

**626. Effective parallel resistance (E.P.R.)****(piezo-electric crystal)**

A measure of the activity of piezo-electric crystals, taking into account all mechanical and electrical losses and the effective shunt capacitance of the maintaining system.

**627. Cat's whisker**

A fine wire making contact at its tip with a rectifying crystal.

**628. Slug**

(a) A small rod-type iron-dust core.

(b) A device used to increase the time of operation of a relay.

**629. Variac (trade name)**

An auto-transformer with a toroidal winding on which moves a sliding contact, giving a continuously adjustable output voltage.

**630. Metrosil (trade name)****Atmite (trade name)**

Silicon-carbide compounds having non-linear voltage-current characteristics.

**631. Thermistor (trade name)**

A device in which use is made of the very large negative temperature coefficient of resistance of certain substances.

**632. Taper**

The relation between an electrical quantity and mechanical position, e.g., the shape of the curve expressing the relation between the setting of the knob of a potential divider and the fraction on one side of the moving contact of the total impedance.

**633. Low tension (L.T.)**

The source of power for heating the cathode of a valve.

**634. High tension (H.T.)**

The source of power for the output from a valve.

**635. Extra high tension (E.H.T.)**

An *H.T.* supply of considerably higher voltage than the normal *H.T.* supply.

**636. Grid bias (G.B.)**

The steady continuous voltage applied between cathode and grid to determine the initial operating point of a valve.

**637. Back bias**

- (a) A continuous negative voltage, derived from interfering signals, applied to the grids of one or more valves in a receiver to reduce overloading by the interfering signals.
- (b) The application of a continuous voltage to metal rectifiers to increase their impedance. (The opposite condition is forward bias).
- (c) A voltage applied to the grid of a valve (or valves) to restore a condition which has been upset by some external cause.

Modulator charging circuit names in pulse technique

**638. A.C. charging**

Line charged through an inductance from a transformer whose primary is fed from an A.C. source.

**639. A.C. rectifier charging**

Line charged by half-wave rectified A.C.

**640. D.C. choke charging**

Line charged through a choke from a D.C. source.

**641. D.C. linear charging**

As *D.C. choke charging*, but resonant frequency of circuit formed by choke and capacitance of line much less than repetition frequency.

**642. D.C. choke rectifier charging**

Line charged from D.C. source through choke and rectifier.

**643. D.C. transformation charging**

As *A.C. charging*, but transformer primary suddenly connected to D.C. source.

**644. D.C. choke control valve charging**

Line charged from D.C. source through choke and valve.

**645. D.C. choke charging with hold-down valve**

As *D.C. choke charging* with addition of a valve, in parallel with the line, which serves to keep the capacitors discharged while energy is built up in the inductance.

**646. D.C. or A.C. resistance charging**

Line charged from D.C. or A.C. source through a resistor.

**SECTION 5—VALVES****701. Electronic device**

A device which makes use of electrons free in vacuous or gaseous space or in boundary layers between dissimilar conductors or semi-conductors.

*Note:* It is clear that mercury-arc rectifiers are included in the above definition as electronic devices, also cathode-ray tubes, copper-oxide rectifiers and such diverse things as spark-gaps, crystal detectors, electron-microscopes, cyclotrons and thermo-junctions. The definition excludes electrical devices dependent solely on ordinary metallic conduction such as motors, relays and galvanometers; also, it excludes devices which depend on electric stress in insulators, such as Kerr cells, piezo-electric crystals and capacitors.

It excludes electric lamps used for illumination or heating, also such lamps used as ballast resistors, and bolometers and thermistors. It excludes electrolytic cells and all devices dependent on electro-chemistry and kataphoretic devices.

**702. Dead impedance**

The impedance between electrodes in the absence of an electron stream, the cathode being heated.

**703. Cold impedance**

(Cold capacitance)

The impedance (capacitance) between the electrodes of a valve when the cathode is not heated.

**704. Perveance (of a diode)**

The ratio of the current to the three-halves power of the applied anode voltage.

**705. Contact potential (diode)**

The potential between the anode and cathode of a diode working into an infinite load, due to difference of work-function between anode and cathode surfaces.

**706. Cavity resonator**

A space, usually of simple shape, enclosed by conducting walls, in which standing electro-magnetic waves can be excited. (B.S.204 Supp. No. 1 No. 2421).

*Note:* The resonant frequencies are determined by the physical dimensions of the cavity and by the dielectric and magnetic properties of the substance with which it is filled.

**707. Thermal tuning**

Adjusting the frequency of a *cavity resonator* by varying its shape by thermal expansion.

**708. Electronic tuning**

(a) Adjusting the frequency of a circuit associated with a valve by altering the mean values of those electrical parameters (electric or magnetic fields) which influence the movement of electrons in the spaces in the valve.

(b) Adjusting the frequency of a cavity by varying the magnitude of an electron beam passing through it.

**709. Velocity modulation (V.M.)**

The acceleration and retardation of electrons in an electron stream in order to cause *bunching*.

**710. Bunching**

The formation of regions of maximum electron density moving forward with the stream. The electrons forming the bunches are not necessarily moving together, but their velocities are related to one another.

**711. Buncher**

The combination of electrodes which cause *velocity-modulation* of electrons in a *velocity-modulation* valve.

**712. Catcher**

The combination of electrodes which extract energy from the electron stream in a *velocity-modulation* valve.

**713. Drift space**

The space between *buncher* and *catcher*.

**714. Cavity magnetron**

Block magnetron (deprecated)

A magnetron having one anode consisting of a block in which are formed a number of *cavity resonators* spaced around the cathode.

**715. Vane-type magnetron**

A *cavity magnetron* in which the walls between adjacent cavities have plane surfaces.

**716. Rising-sum magnetron**

A *vane-type magnetron* in which the cavities are alternately shallow and deep, there being two values of radial depth.

**717. Strap**

A wire or strip connection between the ends of the segments of the anode of a *cavity magnetron*, to promote operation in the desired *mode*.

**718. Ring strap**

A ring-shaped *strap* connecting the ends of certain segments of the anode of a *cavity magnetron*.

**719. Double ring strapping**

The use of two *ring straps*, one being connected to alternate segments and the other to the remaining set of alternate segments.

**720. Echelon strapping**

Connecting the end of each segment by a single *strap* to the next segment but one. The *straps* are all alike and are arranged similarly to a set of blades in a radial-flow turbine.

**721. Rieke diagram**

A type of circle diagram showing the frequency, anode voltage and power output of a valve as functions of the load impedance.



**722. Frequency pulling (general)**

Change in frequency of an oscillator caused by changes in the coupling to adjacent circuits.

**723. Frequency pulling (of a magnetron)**

Change in frequency of a magnetron caused by changing the load impedance.

**724. Frequency-pulling figure**

The maximum variation in frequency which can occur when the *standing-wave* pattern in the feeder near to the oscillator is removed through at least half a wavelength, the *voltage standing-wave ratio* in the feeder being maintained at 0.67. Care must be taken in the first place that the *standing-wave* pattern is sufficiently near to the oscillator to give a maximum variation.

**725. Frequency pushing (of a magnetron)**

Change in frequency caused by change in anode current.

**726. Frequency splitting**

A form of unstable operation of a magnetron in which there is simultaneous emission of the energy at more than one discrete frequency during the *pulse*.

**727. Frequency jumping**

A form of unstable operation of a magnetron in which the frequency remains sensibly constant during a *pulse* but jumps at random from one value to another for successive *pulses*.

**728. Frequency sliding**

Frequency modulation during the *pulse*.

**729. Pi-Mode ( $\pi$ -mode)**

A mode of oscillation of a *cavity-magnetron* in which the oscillations in adjacent cavities are 180° out of phase.

**730. Moding**

A defect of magnetron oscillation in which a magnetron oscillates in one or more undesired *modes*.

**731. Acorn**

A type of miniature valve similar in size and shape to an acorn and having a ring seal about half-way along its length.

**732. Doorknob valve**

A type of very-high and ultra-high-frequency valve similar in size and shape to a doorknob and having a ring seal rather greater in diameter than the axial length of the valve.

**733. Lighthouse tube**

A type of triode valve for centimetre wavelengths having plane electrodes brought out as disc seals, specially designed for use with coaxial-line resonators.

**734. Grounded-grid triode**

Earthed-grid triode

Cathode-input valve (deprecated)

A type of triode designed for use in a *grounded-grid triode circuit*.

**735. Hell tube**

A type of *velocity-modulation* valve in which the *buncher* and *catcher* electrodes form part of a coaxial line, and in which the *drift space* is inside the inner conductor of the coaxial line.

**736. Iconotome**

Farnsworth image dissector (trade name)

A vision pick-up in which the picture is projected optically upon a photo-electric cathode. The resulting groups of photo-electrons are accelerated, focused and deflected in such a way that they impinge in succession on a collecting electrode (see B.S.204, No. 5135)

**737. Cathode-ray tuning indicator (C.R.T.I.)**

Magic eye (trade name)

A small cathode-ray device for indicating visually on a screen the comparative magnitude of a D.C. or A.C. voltage.

**738. Stabilovolt (trade name)**

A multi-electrode gas-discharge tube used as a voltage stabilizer and capable of giving a number of constant-voltage supplies.

**739. Trigatron (trade name)**

A *triggered spark-gap* in a gas-tight envelope.

**740. Triggered spark-gap**

A *spark-gap* in which the main discharge is initiated by a low-power discharge produced by one or more subsidiary electrodes.

**741. Keep-alive electrode**

A supplementary electrode in a gas-discharge tube to which is applied a voltage sufficient to keep the gas at or nearer the point of breakdown by general ionization.

**SECTION 6—CATHODE-RAY TUBES AND DISPLAYS****801. Intensifier electrode**

Post-deflection accelerating electrode

Post-accelerating electrode (deprecated)

An electrode in a cathode-ray tube which accelerates the electron beam after deflection.

**802. Double-beam tube**

A cathode-ray tube in one form of which the electron beam is split into two. Other forms exist with more complete separation of the beams. The two beams are controlled by separate Y-plates, allowing two different waveforms to be examined simultaneously.

**803. Afterglow (of a C.R.T. screen)**

The phosphorescence of the screen after it has ceased to be excited by the electron beam.

**804. Persistence**

The quality of slow decay of the trace in a cathode-ray tube.

**805. Double-layer screen**

A cathode-ray tube screen having two luminescent coatings; under electron impact the first emits light with a very short *persistence* (fluorescence) and the second absorbs this light and converts it into light of another colour with a long *persistence* (phosphorescence).

**806. Double-colour screen**

A triple-layer screen consisting of a *double-layer screen* with the addition of a second long-persistence coating having a different colour and different *persistence* from the first.

**807. Dark-trace tube**

Skiatron (trade name)

Colour-trace tube

A cathode-ray tube with a screen which changes colour but does not necessarily fluoresce under electron impact, showing, for example, a dark trace on a light background.

**808. Storage tube**

A cathode-ray tube having a special screen used to integrate signals or to store them for subsequent scanning.

**809. Spot**

The point of impact of the electron beam on the screen of a cathode-ray tube, whether there be sufficient electrons to excite luminescence or not.

**810. Trace**

Scan (deprecated)

The pattern appearing on the screen of a cathode-ray tube.

**811. Write**

To make a *trace* on a cathode-ray tube screen by moving the spot over it.

**812. Paint**

To leave a picture on a long-persistence screen by the effect of signals on a moving *time-base*, e.g., *P.P.I. display*. Also, as a noun, the picture remaining.

**813. Brighten**

To change the modulator potential of a cathode-ray tube so as to allow the *trace* to appear or to become more intense.

**814. Intensity modulation**

Modulation of the intensity of a cathode-ray beam so that signals are indicated by variations in brightness of the *trace*.

**815. Time-base**

The *trace* when the *spot* is moving without deflection by signals or *noise*, but only in response to a deflecting force or forces which are a pre-terminated function of time.

**816. Linear time-base**

A *time-base* in which the *spot* moves at a sensibly constant speed, in the direction of the time scale, during the useful part of the *time-base*.

**\*817. Echo**

In radar: (a) The radio-frequency energy received after reflection from an object.

(b) The term is also used to describe the deflection or change of intensity on a cathode-ray tube display produced by a radar echo.

**\*818. Side echo**

The effect on the *display* produced by a *side lobe* of a radar *beam*. (BSI).

**\*819. Back echo**

The effect on the *display* produced by the back lobe of a radar *beam*. (BSI).

**\*820. Permanent echo**

A radar echo in a permanent position on the *display*. (BSI).

**821. Break**

An alternative term for *echo*, limited to a lateral discontinuity in a *range-amplitude display*.

**822. Pip**

A deflection or change of intensity on a cathode-ray tube *display*, produced as a calibration- or *range-marker*.

**\*823. Blip****Response**

A momentary deflection or change of intensity, on a cathode-ray tube *display*, produced by the signal from a *responser*. (BSI).

**824. Echo matching**

In *beam-switching*, turning the *aerial* or *array* until the two echoes corresponding with the two directions of the *beam* are equal.

**825. Snow**

A speckled background on an *intensity-modulated display* due to electrical *noise*. (BSI).

**\*826. Grass**

Deflections from the *time-base* on a cathode-ray tube due to electrical *noise*. (BSI).

**827. Hash**

Electrical *noise* generated within a receiver, e.g., by a vibrator or mercury-vapour rectifier.

**\*828. Jitter**

Random departure from temporal regularity of repetition, usually applied to *pulse* repetition. (BSI).

**\*829. Clutter**

Effect on a radar display due to unwanted echoes.

**\*830. Ground returns**

Echoes received from the ground by an air-borne radar set. (BSI).

**\*831. Sea returns**

Echoes received from the surface of the sea by an air-borne radar set. (BSI).

**\*832. Wave clutter**

*Clutter* caused by echoes from waves of the sea. (BSI).

**833. Railings**

Lines, normal to the *time-base* on a *range-amplitude display* produced by a particular type of jamming.

**834. Spotting (radar)**

Observing radar echoes from splashes or ground-bursts made by fall of shot.

**\*835. Range marker**

In radar, a visual discontinuity in the *time-base* of a radar *display* for measuring the range or for calibrating the *time-base*. (BSI).

**\*836. To strobe**

To select a desired epoch of a recurrent phenomenon.

**837. Strobe marker****Strobe (deprecated)**

A small bright *spot*, or a short gap, or other discontinuity produced on the *trace* of a radar *display* to indicate that part of the *time-base* which is receiving attention.

**\*838. Strobe pulse**

A *pulse* of duration less than the period of a recurrent phenomenon used for scrutinizing a particular epoch of that phenomenon. (BSI).

*Note:* The frequency of the strobe pulse bears a simple relation to that of the phenomenon and the relative timing is usually adjustable.

**839. Step strobe marker**

A form of *strobe marker* in which the discontinuity is in the form of a step in the *time-base*.

**840. Well strobe marker**

A form of *strobe marker* in which the discontinuity is in the form of a rectangular depression in the *time-base*.

**841. Walking strobe pulse**

A *Strobe pulse* whose timing (see *strobe pulse*) is automatically varied between given limits.

**842. Automatic strobe pulse**

A *strobe pulse* whose timing is automatically adjusted to coincide with that of a given *echo*, even though the range of the corresponding object varies.

**\*843. Display**

Visual presentation of a signal.

*Note:* In radar it usually refers to presentation on the screen of a cathode-ray tube.

**844. Meter display**

A display in which the indications are given by one or more pointer instruments.

**845. Range-amplitude display**

A radar *display* in which a *time-base* provides the range scale on which echoes appear as deflections normal to the base. The amplitudes of the deflections depend on the intensity of the echoes. (BSI)

**846. Type A display**

A *range-amplitude display* in which the *time-base* is sensibly a straight line. (BSI).

**847. Type B display****Range-bearing display**

A radar *display* in which an *echo* appears as a bright *spot* whose rectangular co-ordinates on the screen indicate the range and bearing of the object. (BSI).

**\*848. Sector display**

A range-amplitude display used with a radar set whose aerial system is continuously rotating. The long persistence screen is excited only while the beam of the aerial system is within a narrow sector centred on the object. (BSI).

**849. Range-height display**

A radar *display* which shows an *echo* as a bright spot on a rectangular field, slant range being indicated along the X axis, height above the horizontal plane being indicated (on a magnified scale) along the Y axis, and height above the earth being shown by a cursor.

**850. Height-position indicator (H.P.I.)**

A radar *display* which shows simultaneously angular elevation, slant range and height in the vertical sight plane of objects detected.

**\*851. Elevation-position indicator (E.P.I.)**

A radar *display* which shows simultaneously angular elevations and distances of objects. (BSI).

**852. Tactical control set****Putter-on****Zone-position indicator (Z.P.I.)**

An auxiliary radar set for indicating the general position of an object to another radar set with a narrower field.

**\*853. Plan position indicator (P.P.I.)**

A radar *display* indicating, as on a map, the relative positions of *echo-producing* objects.

*Note:* In general, the centre of a P.P.I. display corresponds to the position of the radar aerial. (BSI).

**\*854. Off-centre plan display**

A P.P.I. *display*, the centre of which does not correspond to the position of the radar aerial. (BSI).

**\*855. Expand, to**

In radar, to spread out part or all of the scale of a time-base on a *range-amplitude* or *type A display*. (BSI).

**\*856. Expanded-centre plan display**

A P.P.I. *display* on which zero range corresponds to a ring round the centre of the display. (BSI).

**857. Video frequencies**

The frequencies of modulated signals which may be applied to a cathode-ray tube to produce a picture or *display*. This term is sometimes extended to cases in which the signals are not used for the purposes of a visible *display* but cover a similar band of frequencies.

**SECTION 7—IDENTIFICATION****\*901. I.F.F.**

A recognition system using *secondary radar*.

*Note:* The letters I.F.F. stand for Identification Friend or Foe, for which purpose the system was originally developed. (BSI).

**\*902. Interrogator**

A *pulse transmitter* used exclusively for exciting a *transponder*. (BSI).

**\*903. Transponder (transmitter-responder)**

A unit which receives *pulses* from a radar set or *interrogator*, and, in response to the received *pulse*, transmits a pulse or sequence of *pulses* to enable the craft or beacon incorporating it to be recognised by the interrogating station. (BSI).

**\*904. Responsor**

A unit designed to receive the response emitted by a *transponder* due to excitation by the interrogating signal. (BSI).

**905. Coincident transponder**

Secure transponder (deprecated)

A *transponder* which operates only if it is excited by simultaneous signals from an *interrogator* and another *transmitter* associated therewith.

**906. Cross-band transponder**

A *transponder* whose response is not in the same frequency band as interrogation.

**907. Racon (radar beacon)**

A transponder used as a navigational beacon.

**908. Gap coding**

Subdividing the response of a *transponder* into long and short groups of *pulses* (like morse), for recognition purposes.

**909. Width coding**

Modifying the duration of the *pulses* emitted from the *transponder* in accordance with a pre-arranged code for recognition in the *display*.

**910. Chopping (of a transponder)**

Chopped response

Rapid on-off switching of a *transponder* for recognition purposes.

**911. Squitter (of a transponder)**

To produce unwanted self-oscillation owing to incorrect adjustment.

## INDEX TO TERMS DEFINED IN THE GLOSSARY

- Notes: (1) This index also includes the alternative and deprecated terms, and is therefore not a list of approved terms only.  
(2) Entries followed by (D) refer to deprecated terms.  
(3) When reference is made to an item differing from that in the index, the item number is prefaced by 'see'.

- A.C. charging 638  
A.C. rectifier charging 639  
A.C. resistance charging 646  
A.G.C. 551  
A.J. 596  
A.T.R. switch (D) 548  
Absorptive attenuator 399  
Acorn 731  
Activation (quartz crystal) 623  
Activity (crystal) 624  
Aerial 201, note (a) Page 3  
Aerial array 203, note (b) Page 3  
Aerial splitter (D) 542  
Aerial system 202  
Aerial-isolating stage 542  
Aerial switching (D) 258  
Afterglow (of a C.R.T. screen) 803  
Ageing (quartz crystal) 625  
Amplitude separation 525  
Anode follower (D) 588  
Anomalous propagation (D) 290  
Antenna 201 note (a) Page 3  
Anti-clutter gain control 552  
Anti-jamming 596  
Anti-jitter circuit 570  
Anti-T.R. box (D) 548  
Aperture 222  
Aperture illumination 325  
Array 203, note (b) Page 3  
Armite 630  
Attenuator, cut-off 397  
Autocontrol 104 (note)  
Automatic aiming 268  
Automatic bearing measurement 267  
Automatic elevation measurement 267  
Automatic following 269  
Automatic frequency control 550  
Automatic gain control 551  
Automatic gain stabilization 553  
Automatic range measurement 267  
Automatic strobe pulse 842  
Automatic volume control (D) 551
- Back bias 637  
Back echo 819  
Back-to-front ratio (in D.F.) 245  
Balance-to-unbalance transformer 379  
Balanced T, see 376  
Balun 380  
Base-line stabilization 526  
Bazooka (D) 380  
Beam 252  
Beam aerial 203, note (b) Page 3  
Beam splitting (D) 258  
Beam switching 258  
Beam width 253  
Beat frequency 516  
Beavertail beam 255  
Bend 334  
Blanking 595  
Bleeder 618  
Blind area (D) 288  
Blip 823  
Block magnetron (D) 714  
Blocking (D) 569  
Blocking, grid 568  
Blocking condenser 612  
Blocking oscillator 567  
Break 821  
Brighten 813  
Broad-band 518  
Buffer condenser 616  
Buffer stage 601  
Buncher 711  
Bunching 710  
Butterfly circuit 604  
By-pass condenser 613
- C.R.T.I. 737  
Camouflage, radar 295  
Capacitive reactance (in waveguide technique) 319  
Catcher 712  
Cathode follower 587  
Cathode-injection oscillator 563  
Cathode-input valve (D) 734  
Cathode-ray tuning indicator 737  
Cat's whisker 627  
Cavity magnetron 714  
Cavity resonator 706  
Centimetre waves 272  
Centimetric waves (D) 272  
Characteristic impedance 316  
Cheese 212  
Choke (in waveguide technique) 354  
Choke coupling (in waveguide technique) 355  
Choke piston 392  
Choked flange 356  
Chopped response 910  
Chopping (of a transponder) 910  
Clamp 527  
Clamping switch 528  
Clip 523  
Clutter 829  
Coding, gap 908  
Coding, width 909  
Coherent-pulse technique 514  
Coincidence valve 591  
Coincident transponder 905  
Cold capacitance 703  
Cold impedance 703  
Colour-trace tube 807  
Combiner 557  
Common-grid circuit 592  
Common T-R working 545  
Confusion region 289  
Conical scan 264  
Connector (in waveguide technique) 344  
Contact piston 391  
Contact potential (diode) 705  
Converter (D) 558  
Corner 339  
Corner aerial 236  
Corner reflector 235  
Corner-reflector aerial (D) 236  
Cosecant-squared beam 257  
Counting down 517  
Coupling (in waveguide technique) 353  
Coupling condenser 612  
Coupling factor 320  
Coupling loop 357  
Coverage diagram 243  
Crank 266  
Crepitation noise 535  
Critical dimension 311  
Critical frequency 313  
Critical wavelength 314  
Cross-band transponder 906  
Crystal callibrator 560  
Crystal check oscillator 560  
Crystal-controlled oscillator 561  
Cut (crystal) 621  
Cut paraboloid 211  
Cut-back paraboloid (D) 211  
Cut-off attenuator 397  
Cut-off waveguide 328  
Cutler feed 234
- D.C. choke charging 640  
D.C. choke charging with hold-down valve 645  
D.C. choke rectifier charging 642  
D.C. choke control valve charging 644  
D.C. linear charging 641  
D.C. re-establishment 526  
D.C. resistance charging 646  
D.C. restoration 526  
D.C. transformation charging 643  
Dark-trace tube 807  
Dead impedance 702  
Decimetre waves 273  
Decoupling network 611  
Delay line 575  
Delay network 575  
Diaphragm 362  
Diaphragm-ring filter 370  
Diaphragm-ring mode-filter 370  
Dielectric lens 230  
Dielectric matching plate 387  
Dielectric radiator 228  
Dielectric rod radiator 229  
Differentiating circuit 571  
Diode switch 590  
Diplexer 543  
Direction of polarization 310  
Direction-finding, radio 111  
Directional coupler 358  
Directive feed 358  
Director 206  
Director element 206  
Dish 210  
Display 843  
Ditch 349  
Dominant mode 302  
Door-knob transformer 372  
Door-knob valve 732  
Doppler, radio 107  
Dot-lock 291  
Double peak amplitude 511  
Double peak amplitude swing (D) 511  
Double ring strapping 719  
Double-beam tube 802  
Double-colour screen 806  
Double-layer screen 805  
Double-peak amplitude swing 511  
Double-pulse-position modulation 508  
Drift space 713  
Driver stage 602  
Dropping resistor 617  
Dumb-bell slot 221, 364  
Dumb-bell waveguide 329  
Duplexer (D) 545  
Duty factor 513  
Dynatron 589
- E.H.T. 635  
E.P.I. 851  
E.P.R. 626  
E bend 335  
E mode 305  
E<sub>mn</sub> mode 306  
Earthed-grid triode 734  
Echelon circuit 576  
Echelon strapping 720

## INDEX TO TERMS DEFINED IN THE GLOSSARY (contd.)

- Echo 817  
 Echo box 608  
 Echo matching 824  
 Echo splitting (D) see 258  
 Edgewise bend 337  
 Effective parallel resistance (piezo-electric crystal) 626  
 Elbow 339  
 Electrical scanning 262  
 Electronic device 701  
 Elevation-position indicator 851  
 Electronic tuning 708  
 Elementary aerial 208  
 Equi-signal surface 238  
 Equivalent noise temperature (of a component) 533  
 Evanescent mode 308  
 Evanescent waveguide 328  
 Expand, to 855  
 Expanded-centre plan display 856  
 Extra high tension 635
- F.M. radar 294  
 Fan beam 254  
 Farnsworth image dissector 736  
 Field-strength diagram 239  
 Filter (waveguide) 365  
 Fire 577  
 Firing circuit 578  
 Flanged connector 345  
 Flange coupling 359  
 Flap attenuator 396  
 Flare 224  
 Flatwise bend 338  
 Flexible coupling 360  
 Flexible waveguide 332  
 Flip-flop circuit 581  
 Floating paraphase 588  
 Folded dipole 217  
 Four-wire amplifier, note (d) Page 10  
 Four-wire circuit, note (b) Page 10  
 Four-wire repeater, note (d) Page 10  
 Frequency changer 558  
 Frequency dividing (D) 517  
 Frequency jumping 727  
 Frequency pulling (general) 722  
 Frequency pulling (of a magnetron) 723  
 Frequency pushing (of a magnetron) 725  
 Frequency sliding 728  
 Frequency splitting 726  
 Frequency synthesiser 562  
 Frequency-changing circuit 588  
 Frequency-pulling figure 724  
 Front-to-back ratio 244  
 Fundamental mode 302
- G.B. 636  
 Gabling 326  
 Gap 250  
 Gap coding 908  
 Gap filling 251  
 Gasket, waveguide 347  
 Gate valve 591  
 Gating 594  
 Goniometer 609  
 Goniometry, radio-108  
 Grass 826  
 Grid bias 636  
 Grid blocking 568  
 Grid locking 569  
 Ground returns 830  
 Ground wave 281, 282  
 Grounded-grid triode 734  
 Grounded-grid triode circuit 592  
 Guide wavelength 315  
 Guided propagation 290
- H bend 336  
 H mode 303  
 H<sub>mn</sub> mode 304  
 H.P.I. 850  
 H.T. 634  
 Hash 827  
 Height-position indicator 850  
 Heil tube 735  
 High tension 634  
 Hoghorn 226  
 Horizontal field-strength diagram 240  
 Horn 224  
 Hybrid T 376
- I.F.F. 901  
 Iconotome 736  
 Image dissector, Farnsworth 736  
 Impedance (in waveguide technique) 316  
 Inductor reactance (in waveguide technique) 319  
 Integrating circuit 572  
 Intensifier electrode 801  
 Intensity modulation 814  
 Interrogator 902  
 Inverter, phase 603  
 Iris 381  
 Isochrone 285  
 Isochrone determination 110
- Jitter 828  
 Johnson noise 530
- Keep-alive electrode 741  
 Kipp relay (D) 581
- L.W. 277  
 L.T. 633  
 Lantern, see 237  
 Lens, waveguide 232  
 Lighthouse tube 733  
 Line lengthener 395  
 Line stretcher (D) see 395  
 Linear time-base 816  
 Lobe 247  
 Lobe swinging (D) 258  
 Lobe switching (D) 258  
 Lobing (D) 258  
 Local oscillator 559  
 Lock 598  
 Lock-dot 291  
 Lock-following (D) see 269  
 Lock-in (D) 598  
 Locking, grid 569  
 Long waves 277  
 Low tension 633
- M.U.F. 283  
 M.W. 276  
 Magic eye 737  
 Magic T, see 376  
 Main lobe 248  
 Major bend 337  
 Mark-to-space ratio (D) 513  
 Marx circuit 606  
 Matched termination 343  
 Matching pillar 386  
 Matching plate 385  
 Matching post 386  
 Matching strip 384  
 Maximum usable frequency 283  
 Mean pulse amplitude (for pulse transmitters) 512  
 Measuring section, see 402  
 Medium waves 276  
 Metal lens, see 232
- Meter display 844  
 Metre waves 274  
 Metric waves (D) 274  
 Metrosil 630  
 Miller circuit 584  
 Miller valve 585  
 Millimetre waves 271  
 Minor bend 338  
 Mirror 207, note (d) Page 3  
 Mixer (D) 556  
 Mode 301  
 Mode changer 366  
 Mode-filter (waveguide) 367  
 Mode-filter slot 368  
 Mode transformer 366  
 Moding 730  
 Modulator charging circuit names 638—646  
 Multivibrator 582  
 Muting circuit 555
- Nacelle, see 237  
 Navigation, radio 113  
 Net 597  
 Noise 529  
 Noise factor (of a receiver) 532  
 Noise figure 532  
 Noise suppression 554  
 Noise temperature (D) 533  
 Noise temperature ratio 534  
 Non-critical dimension 312  
 Non-dissipative stub 383  
 Non-reflecting termination 343  
 Non-resonant dimension (D) 312  
 Normalized impedance 318  
 Nozzle 227
- Off-centre plan display 854  
 One-shot multivibrator (D) 581  
 Optimum working frequency 284  
 Overtone crystal 622
- P.E. 820  
 P.P.I. 853  
 Pad 400  
 Padding condenser 615  
 Paint 812  
 Panoramic receiver 541  
 Paraboloid, cut 211  
 Parallel-plate guide 231  
 Parasitic element (D) 205  
 Passive element 205  
 Peak 509  
 Peak, to 510  
 Peak value 509  
 Peak-level stabilization 526  
 Peak-to-peak amplitude 511  
 Permanent echo 820  
 Persistence 804  
 Perveance (of a diode) 704  
 Phantastron 586  
 Phase inverter 603  
 Phase shifter 395  
 Pi-mode 729  
 Pillar, matching 386  
 Pillbox, see 212  
 Pip 822  
 Piston 390  
 Piston attenuator 398  
 Plan-position indicator 853  
 Plunger 390  
 Polar diagram 242  
 Polarization, direction of 310  
 Polyrod 229  
 Position-line determination 106  
 Post, matching 386  
 Post-accelerating electrode (D) 801  
 Post-deflection accelerating electrode 801

## INDEX TO TERMS DEFINED IN THE GLOSSARY (contd.)

- Power divider 378  
 Precipitation noise 535  
 Precipitation static 535  
 Preselector unit 549  
 Presentation, see 843  
 Primary radar 112 (note)  
 Primary radiating element 204  
 Primary radiator 204, note (c) Page 3  
 Probe 373  
 Programme mixer 557  
 Pulse 501, 502  
 Pulse modulation 503  
 Pulse-amplitude modulation 504  
 Pulse-duration modulation 505  
 Pulse-forming circuit 573  
 Pulse-forming network 573  
 Pulse-frequency modulation 507  
 Pulse-length modulation 505  
 Pulse-phase modulation 506  
 Pulse-position modulation 506  
 Pulse-shaping circuit 574  
 Pulse-shaping network 574  
 Pulse-time modulation 506  
 Pulse-width modulation 505  
 Pulsed-carrier modulation 503  
 Putter-on 852
- Quarter-wavelength collar 380  
 Quiescent A.G.C., circuit 555
- R.F. head 544  
 R.F. pulse 502  
 R/T (Radio telephony) 293  
 Racon (Radar beacon) 907  
 Radar 112  
 Radar camouflage 295  
 Radar, primary 112 (note)  
 Radar, secondary 112 (note)  
 Radiating element (D) 208  
 Radio autocontrol 104 (note)  
 Radio communication 102  
 Radio control 104  
 Radio detection 105  
 Radio direction-finding 111  
 Radio doppler 107  
 Radio gonometry 108  
 Radio navigation 113  
 Radio position-line determination 106  
 Radio range-finding 109  
 Radio telecontrol 104 (note)  
 Radio telephony 293  
 Radio warning 105  
 Radio waves 101  
 Radiogoniometer 609  
 Radiolocation 103  
 Radome 237  
 Railings 833  
 Range marker 835  
 Range-amplitude display 845  
 Range-bearing display 847  
 Range-finding, radio 109  
 Range-height display 849  
 Reactance, inductive/capacitive 319  
 Reactive attenuator, see 397  
 Receiver protector 546  
 Reflector 207, note (d) Page 3  
 Reflector element 207  
 Regeneration 593  
 Relaxation circuit 579  
 Resonant diaphragm 363  
 Resonant dimension (D) 311  
 Response, see 823  
 Responsor 904  
 Rhombic aerial 214  
 Rieke diagram 721  
 Ring filter 369  
 Ring mode filter 369  
 Ring strap 718  
 Ring switch 377  
 Rising-sun magnetron 716  
 Risk area (D) 288  
 Rod mirror 209  
 Rod reflector 209  
 Rolled plate scanner 233  
 Rolled throat 233  
 Rotating joint 371
- S.H.F. 270  
 S.W. 275  
 S.W.R. 323  
 Scan (D) 810  
 Scan 259  
 Scanner 261  
 Scramble 522  
 Screen suppression 620  
 Sea returns 831  
 Seal (in waveguide technique) 348  
 Search 260  
 Secondary radar 112 (note)  
 Sector display 848  
 Sector scanning 263  
 Secure transponder (D) 905  
 See-saw circuit 588  
 Self-quenching oscillator 565  
 Semi-butterfly circuit 605  
 Sender 536  
 Septate mode 309  
 Septate waveguide 331  
 Septum 330  
 Series T 374  
 Service-area diagram 243  
 Shadow area (D) 288  
 Shadow region 288  
 SHM, waveguide 346  
 Short waves 275  
 Shunt T 375  
 Side echo 818  
 Side lobe 249  
 Side-outlet T, see 376  
 Signal-to-noise ratio 531  
 Silent zone 287  
 Skiatron 807  
 Skip area 286  
 Skip zone 287  
 Skirt 350  
 Slice 524  
 Slot aerial 220  
 Slot radiator 219  
 Slotted measuring section 402  
 Slug 628  
 Snow 825  
 Spectrometer 539  
 Spectroscope 540  
 Spectrum analyser 539  
 Spinner 265  
 Split (D) 258  
 Spongy-lock oscillator 564  
 Spot 809  
 Spot frequency 278  
 Spotting (radar) 834  
 Spout 227  
 Squeeze box (D) see 393  
 Squeeze section 393  
 Squegger 566  
 Squelch circuit (D) 555  
 Squint 246  
 Squitter (of a transponder) 911  
 Stabilovolt 738  
 Stable trigger circuit 580  
 Stack 213  
 Stagger 600  
 Standing wave 322  
 Standing-wave ratio 323  
 Stationary wave 322
- Step strobe marker 839  
 Stopper 619  
 Storage tube 808  
 Strap 717  
 Strip attenuator 396  
 Strobe (D) 837  
 Strobe, to 836  
 Strobe marker 837  
 Strobe pulse 838  
 Stub support 352  
 Sub-dividing 517  
 Sub-waveguide, see 328  
 Super-frequency (D) 270  
 Super-high frequency 270  
 Super-refraction 290  
 Swept gain 552  
 Swing (D) 511  
 Swing (in D.F.) 610  
 Synchronize 599  
 Synthesizer 562
- T.E. mode 303  
 T.E.M. mode 307  
 TE<sub>mn</sub> mode 304  
 T.M. mode 305  
 TM<sub>mn</sub> mode 306  
 T.R. box 547  
 T.R. switch 546  
 T.R. unit 547  
 T<sub>2</sub>R box (D) 544  
 Tactical control set 852  
 Tail-eating connection 607  
 Taper 632  
 Telecontrol 104 (note)  
 Temporal gain (D) 552  
 Terminated folded dipole 218  
 Terminated guide, see 343  
 Termination (in waveguide technique) 342  
 Thermal noise 530  
 Thermal tuning 707  
 Thermistor 631  
 Throat 225  
 Time-base 815  
 Trace 810  
 Tracking condenser 615  
 Transceiver 538  
 Transforming section 389  
 Transitron 583  
 Transmitter 536  
 Transmitter blocker 548  
 Transmitter-receiver 537  
 Transponder 903  
 Transverse electric and magnetic mode 307  
 Transverse magnetic mode 305  
 Travelling wave 321  
 Trigatron 739  
 Trigger 577  
 Trigger circuit 580  
 Triggered spark-gap 740  
 Triggering circuit 578  
 Trimming condenser 614  
 Trombone 394  
 Tuning screw 382  
 Turnstile aerial 216  
 Twist 340  
 Two-band amplifier 520  
 Two-band repeater 520  
 Two-band working 519  
 Two-wire amplifier, note (c) Page 10  
 Two-wire circuit, note (a) Page 10  
 Two-wire repeater (D) note (c) Page 10  
 Type A display 846  
 Type B display 847
- U.L.F. (D) 283

**INDEX TO TERMS DEFINED IN THE GLOSSARY (contd.)**

V.M. 709  
V.S.W.R. 324  
V-beam system 256  
Valve stabilizer circuit, see 570  
Vane-type magnetron 715  
Variac 629  
Velocity modulation 709  
Vertebrate waveguide 333  
Vertex plate 223  
Vertical field-strength diagram 241  
Video frequencies 857  
Voltage standing-wave ratio 324

W/T (Wireless telegraphy) 292  
Walking strobe pulse 841  
Wave clutter 832  
Wave impedance 317  
Waveguide 327  
Waveguide gasket 347  
Waveguide lens 232  
Waveguide shim 346  
Waveguide switch 351  
Wedge 401  
Well strobe marker 840  
Whip aerial 215  
Wide-band 518  
Width coding 909

Window 361  
Wireless 102  
Wireless telegraphy 292  
Wobulation 515  
Write 811

Z.P.I. 852  
Z.S.F. 280  
Zero-skip frequency 280  
Zone-position indicator 852  
Zwei-band working 521

**END**