

Universal Decimal Classification —

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UDC 52 Astronomy — Astrophysics —
Space research — Geodesy

UDC 025.45:52

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Foreword

The English version of the Universal Decimal Classification (UDC) is being prepared and published as BS 1000 by the British Standards Institution (BSI) at the original joint request of the British Society for International Bibliography (BSIB) and the Association of Special Libraries and Information Bureaux (ASLIB), now amalgamated as Aslib. It has the approval of the Lake Placid Education Foundation, New York, proprietors of the Dewey Decimal Classification, from which UDC derives. The English Full Edition of the UDC is authorized by the International Federation for Documentation (FID), The Hague, Netherlands.

This section is part of the English Full Edition. It should be used in conjunction with the Abridged English Edition, BS 1000A, which refers to many other subjects of interest not listed in this schedule, and provides a conspectus of the whole scheme, together with an introduction to its use. For further practical information about the principles, application and utilization of the scheme, users should refer to BS 1000C.

This edition of UDC 52 includes modifications authorized in “Extensions and Corrections to the UDC” up to and including Series 9, No. 2 dated March 1976. Subsequent issues of “Extensions and Corrections to the UDC” should be consulted to keep the schedule up to date. Further information about this and other UDC publications is given on pages 48 and 49. British Standards related to this part of BS 1000 are listed on the inside back cover.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 50, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Scope

Under 52 is classed information about astronomy (theoretical and practical), navigation, geodesy, surveying, photogrammetry and cartography, and their associated instruments.

Related subjects

- 333 Land and landed property
- 34 Jurisprudence. Law. Legislation.
- 35 Public administration. Military art and science
- 51 Mathematics
- 53 Physics
- 54 Chemistry. Crystallography. Mineralogy
- 55 Geology. Meteorology. Hydrology
- 573.5 The problem of the origin of life. Life on other planets. Exobiology
- 621.3 Electrical engineering
- 622 Mining. Mineral dressing
- 623.64 Topography. Cartography. Surveying — Military engineering
- 624 Civil and structural engineering in general
- 625 Civil engineering of land transport
- 629 Transport vehicle engineering
- 655 Graphic industries. Printing. Publishing. Book trade
- 667.6 Coatings and coating techniques. Paints. Varnishes. Lacquers
- 681.2 Instrument making. Instrumentation. Measuring instruments and their manufacture
- 681.3 Data processing machines and equipment. Automatic data processing. Computers. Calculators etc
- 681.7 Optical apparatus and instruments
- 71 Physical planning
- 727.91 Observatories. Field (recording) stations — Architecture
- 744 Linear, geometric, technical drawing
- 77 Photography
- 91 Geography

Auxiliary signs and subdivisions

Full information about the common and special auxiliary signs and subdivisions (often abbreviated to “common and special auxiliaries”) will be found in BS 1000A and BS 1000C.

Colon sign of relation. For the classification of information for the public, as in abstracts and bibliographies, maximum use of colon combinations rather than of common or special auxiliaries is recommended. The use of the colon sign of relation is preferable for multiple entry systems, as it will help prevent the concealment of information. This usually results in longer notation, however, and for information for more restricted use, the application of auxiliaries, where available, may be simpler and more convenient provided that there is an adequate alphabetical subject index.

Common auxiliaries. The common auxiliaries of language = . . . , form (0 . . .), place (1/9), race and nationality (= . . .), time “ . . . ”, point of view. 00 . . . , materials –03 . . . and persons –05 . . . are applicable throughout the UDC. However, they should be used mainly to express concepts not otherwise provided for in the schedules. Particularly useful here are alphabetic extension, for the names of heavenly bodies, e.g. at 525.45, and the asterisk to introduce non-decimal numeric subdivision, for catalogue designations, e.g. at 523.45-87, 523.985. 7–77. For some phenomena, e.g. satellites, either system is equally appropriate (compare Deimos at 523.43–87 DEIMOS with Io at 523.46–87*1), but the classifier will normally decide which is more effective for the needs of his collection.

Special auxiliaries. The special auxiliary subdivisions listed under 52 are applicable only to 52/524. Those listed under 520.2 are applicable only to 520.2/.25. Special auxiliaries are also provided at 520.6, 520.8, 524.31, 528, 528.5 and 528.7. These may be detached and applied to any subdivision of the number at which they are listed, e.g.

- | | |
|--------------------|-------------------------------------|
| 528.7.029.672 | Infrared rays |
| 528.711.11 | Photogrammetric (surveying) cameras |
| 528.711.11.029.672 | Infrared cameras for photogrammetry |

The auxiliaries quoted under 520.2 are derived from those listed under 681.7. The subdivisions of 528.08 are derived from those of 53.08. The hyphen auxiliaries at 528.5 are derived from those listed under 62. Some of the subdivisions of 528.7.029.4/.6 are derived from 621.3.029.4/.6. Each of these series may be further developed by reference to its source.

Typographic presentation

Small type is used for cancelled numbers and text. The arrow $\rightarrow$ means either “see” or “see also” according to the context. The symbol $\cong$ “subdivide as” means that the number preceding it may be subdivided in the same way as, and with meanings analogous to the subdivisions of, the number which follows it.

Abbreviations

The following abbreviations are used in the text of 52/524, as being the usual forms:

HD	Henry Draper
HDE	Henry Draper Extension
IC	Index catalogue (see bibliographical references)
LTE	Local thermodynamic equilibrium
LZT	Lallemant zenith tube
M	Messier (see bibliographical references)
MKK	Morgan, Keenan, Kellmann
MW	Mount Wilson
NGC	New general catalogue (see bibliographical references)
(P,V) _E	(Photographic, visual) electronic
PZT	Photographic zenith tube
RGU	Rot, grün, ultraviolett
R,I	Rot, infrarot
VZT	Visual zenith tube
UBV	Ultraviolet, blue, visible

Bibliographical references

The full references for the works cited under 524.45 are: ALTER, G., RUPRECHT, J. and VANYSEK, V. Catalogue of star clusters and associations. Prague: Czechoslovak Academy of Sciences; New York: Plenum Press, 1958 (and updated) Second edition, ed. G Alter, B. Balazs, J Ruprecht. Budapest: Publishing House of the Hungarian Academy of Sciences, 1970.

Index catalogue (IC)

Dreyer, J.L.E. Index catalogue of nebulae found in the years 1888 to 1894, with notes and corrections to the New General Catalogue. *Mem. R. Astron. Soc.*, **51**, 1895. 185–228. (Reprinted with NGC and IC II. London, Royal Astronomical Society, 1955).

Second index catalogue (IC II)

Dreyer, J.L.E. Second Index catalogue of nebulae and clusters of stars, containing objects found in the years 1895–1907, with notes and corrections to the New General Catalogue and to the Index Catalogue for 1888–94. *Mem. R. Astron.*

Soc., **59**, 1910. 105–198. (Reprinted with NGC and IC. London, Royal Astronomical Society, 1955).

Messier catalogue (M)

Garstang, R.H. The Messier objects.

Handb. Br. Astron. Assoc., **43**, 1964. 63–68; also, Catalogue of Messier. (*In*, Atlas of the heavens–II. Catalogue 1950. Bečvář, Antonin. Praha, Czechoslovak Academy of Sciences; Cambridge, Mass., Sky Publishing Corporation, 1964. pp. 333–339).

Charles Messier’s Catalogue was originally published in *Connaissance des Temps*. 1787 (publ. 1784), p. 238–279.

New General catalogue (NGC)

Dreyer, J.L.E. New general catalogue of nebulae and clusters of stars; being the catalogue of the late Sir John F.W. Herschel, revised. *Mem. R. Astron. Soc.*, **49**, 1888. 1–237. (Reprinted with the Index Catalogue(s). London, Royal Astronomical Society, 1955).

SCHEDULE

52 Astronomy. Astrophysics. Space research. Geodesy

Special auxiliary subdivisions

52-1/-8	PROPERTIES, PROCESSES, PARTS ETC <i>To be used only at 52/524</i>	52-334.6	Thermal conductivity
		.7	Electrical and magnetic properties
52 -1	MODE OF TREATMENT	-335	Physical state variables
-12	Initial investigation	.3	Density
-121	Unidentified objects	.5	Pressure
-123	Initial hypotheses	.7	Temperature
-125	Prediction(s)	-336	Gravity field
-126	Search(es)	-337	Magnetic field
-28	Discovery(-ies)	-338	Age
-13	Observation(s) and measurement(s).	-34	Distribution of bodies in a system of systems
	Reduced data	-35	Radiation from body or system
	→520 Instrumentation and techniques		→52-6 Processes relevant to radiation
	<i>Further particulars may be denoted by the common auxiliaries of form [Table I(d)], e.g. 52-13(083.8) Catalogues of observations</i>	-352	52-7 Character of radiation
-14	Results of analysis and evaluation of observations and measurements	-353	Apparent intensity (as observed). Apparent magnitude. Flux density
	<i>Further particulars may be denoted by the common auxiliaries of form [Table I(d)], e.g. 52-14(083.8) Catalogues</i>	-355	Absolute intensity (as emitted). Absolute magnitude
	(084) Charts. Atlases. Graphic representations	.3	Spectrum. Spectral type
-16	Theoretical treatment and development	.7	Line spectrum
	→521 Theoretical astronomy	-357	Continuum
-17	Numerical treatment. Simulation. Mathematical techniques	-36	Polarization
	<i>Further particulars may be denoted by colon combination with the subdivisions of 51</i>	-37	Chemical composition. Abundances
		-38	52-366/-367 $\cong$ 546/547
52-3	PROPERTIES AND PHENOMENA, ESPECIALLY GEOMETRICAL	-383	Biological properties
-32	Position and motion	-384	Geometrical phenomena
-323	Position	52-4	→52-56 Variability
.2	Angular coordinates	-42	Seasonal phenomena
.3	Distance	-423	Diurnal phenomena
.33	Parallax	.3	PROCESSES RELEVANT TO BODIES AND SYSTEMS
.35	Light-time	.4	Interactions between bodies within systems
.4	Doppler shift. Radial velocity	-424	Gravitational interactions
.6	Position in space	-425	Tidal interactions
.7	Distribution in space	-43	→521.16 Theories of tidal interaction etc
.8	Orbital motion. Elements of orbit	-44	Mass-flow. Exchange of mass
-325	Motion	-46	Collisions
	→521 Theoretical astronomy. Celestial mechanics etc	-462	Electromagnetic forces
.2	Proper motion	-464	Condensation. Accretion
.4	Radial velocities	-466	Disintegration. Separation. Mass-loss
-327	Rotation	-468	Bulk-matter processes
-33	Physical properties (except radiation)	-47	Conduction
-332	Dimensions and shape parameters	-472	Convection
.2	Apparent angular dimensions	-473	Turbulence
.4	Linear dimensions	-48	Shock processes
.5	Oblateness parameters		Atomic processes
.6	Irregularities in shape		Excitation
-333	Mass		Ionization
-334	Physical bulk properties		High-energy processes. Nuclear reactions
.2	Mechanical properties		<i>Particulars of nuclear reactions may be denoted by colon combination with the subdivisions of 539.17, e.g. 52-48:539.173 Fission (in bodies and systems)</i>
.4	Viscosity	52-5	STAGES IN DEVELOPMENT OF BODIES AND SYSTEMS
.5	Opacity. Refractive index	-52	Origin. Formation. Cosmogony
		-54	Evolution. Change of state or structure
		-55	Stability. Equilibrium

52-56	Variability	52-77	Radio radiation (λ more than 1 mm)
	→52-38 Geometrical phenomena		<i>Frequency or wavelength may be denoted after an asterisk, e.g.</i>
-563	Regular variability. Pulsation	52-77*1	420 MHz Frequency of 1 420 megahertz
-565	Irregular variability. Explosion	52-77*210	mm Wavelength of 210 millimetres
-567	Isolated change. Quakes. Tremors		
-59	Catastrophic change of state or structure. Final stages		
52-6	PROCESSES RELEVANT TO RADIATION	-78	Waves in plasmas
-62	Emission	-782	Shock waves
-622	Thermal	52-8	PARTS AND FEATURES OF INDIVIDUAL SYSTEMS
-624	Synchrotron	-82	Interior. Central region. Head (of comet)
-626	Stimulated. Laser and maser emission	-823	Core. Nucleus (of comet)
-628	Luminescence	-825	Mantle
52-64	Radiative transfer	-827	Crust. Subsurface region
-645	Non-LTE	-83	Surface. Surface features
-65	Propagation	-834	Solid features. Lithosphere. Mountains, craters, rills
-652	Reflection		Oceans. Hydrosphere
-653	Refraction	-836	Photosphere
-655	Polarization	-837	Regional features
.5	Faraday effect. Faraday rotation	-84	Polar features
-656	Interference. Diffraction. Coupling	-842	Mid-latitude features
-657	Absorption. Reddening	-843	Equatorial features
-658	Scintillation	-844	Apparent disc
-67	Frequency and wavelength shifts. Doppler effect. Aberration	-846	Apparent edge
-68	Velocity. Speed	-847	Terminator
-683	Acceleration	-848	Exterior regions
-687	Retardation. Deceleration	-85	Atmosphere
52-7	CHARACTER OF RADIATION	-852	Ionosphere
-72	Corpuscular radiation	-853	Magnetosphere
-724	Protons and atomic nuclei	-854	Spiral arms
-726	Plasma	-856	Halo. Extended atmosphere
-728	Neutrinos	-857	Exterior features. Surroundings. Circum...
-73	Very short-wave photons	-86	Rings and disc features
-732	Gamma rays	-862	Tails
-735	X-rays (λ less than 1 mm)	-864	Filaments, jets and links
-739	Extreme ultra-violet (λ 1 nm to 50 nm)	-866	Satellites. Companions
-74	Ultra-violet radiation (λ 50 nm to 300 nm)	-87	Peculiar features
-75	Visible radiation (λ 0.3 μ m to 0.7 μ m)	-88	Measurements; methods, apparatus [<i>in</i> BS 1000A; <i>cancelled</i>] →52-13,520
-76	Infra-red radiation (λ 0.7 μ m to 1 mm)	52.08	

Principal divisions

520	INSTRUMENTATION AND TECHNIQUES (ASTRONOMY AND ASTROPHYSICS)	520.18	Site selection (from astronomical viewpoint)
	→681.7 Optical apparatus and instruments	→520.16	Problems caused by the Earth's atmosphere
520.1	OBSERVATORIES		<i>Further particulars may be denoted by the common auxiliaries of place [Table I (e)], e.g.</i>
.16	Problems caused by the Earth's atmosphere. Seeing. Transmission	520.18(23)	Mountain observatory sites
	→523.31-852- 35"414.22" Light of the night sky	(468.5)	In Canary Islands: Tenerife observatory
	524.827 Sky-background radiation	520.2	TELESCOPES
	551.591 Visibility. Optical range — Meteorology		<i>Further particulars may be denoted at the subdivisions of 520.2/.25 by the .0 special auxiliaries listed under 681.7, e.g.</i>
.17	Design, construction and engineering of domes	520.2.01	Theory and general properties
	→727.91 Observatories — Architecture	.02	Construction
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	520.17:624.15 Special foundations for domes	.06	Optical components
	:667.637 Special coatings (paints) for domes	.062	Mirrors
		.063	Gratings

520.2 (contd.)	520.2.064.4	Filters	520.328	Micrometers
	.065	Prisms	.33	Photographic instruments and equipment
	.066/.067	Lenses. Lens systems. Objectives		<i>Further particulars may be denoted by colon combination with the subdivisions of 77</i>
	.07	Mechanical components	.332	Plateholders
	.072	Mountings	.338	Photographic plates
	.075	Drives, guiding and control	.34	Photoelectric instruments and equipment
	→681.5	Automatic control engineering		<i>Further particulars may be denoted by colon combination with the subdivisions of 621.383</i>
	.076	Support systems	.342	Photocells
.22		General-purpose optical telescopes	.343	Photomultiplier tubes
.222		Refractors. Long-focus telescopes	.344	Photoelectronic image tubes. Image intensifiers
.224		Reflectors. Reflecting telescopes in general. Foci	.2	Electronic camera
		<i>Further particulars may be denoted by the special auxiliaries listed under 681.7, e.g.</i>	.6	Television. Image orthicons
	520.224.062.42	Parabolic mirrors		<i>Further particulars may be denoted by colon combination with the subdivisions of 621.397</i>
.2		Gregorian focus telescopes	.35	Spectroscopic instruments
.3		Newtonian focus telescopes	.353	Spectrographs
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.5		Coude focus telescopes	.36	Interferometers
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.78		Bouwers telescopes	.378	Timing equipment
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.243		Solar towers	.42	Coordinate measuring instruments
.244		Spectroheliographs	.43	Densitometers. Microphotometers
.245		Monochromators	.44	Spectrophotometers
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.253		Meridian circles	.03	Balloon-borne instruments
.254		Vertical circles	.04	Rocket-borne instruments
.255		Zenith tubes (PZT, VZT, LZT etc)	.05	Satellite-borne instruments
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.257		Astrographs. Astrographic cameras	.08	Instruments for observations from the Moon and other celestial bodies
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.2		Antennae	.622	Flux detectors
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.24		Feed	.626	Spectrometers, e.g.
.25		Mountings		520.626.05 Satellite spectrometers
.28		Drives and control systems	.627	Polarimeters
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.5		Receivers	.64	Plasma analysers (in situ)
.55		Amplifiers	.642	Ion analysers (mass and charge)
	→621.375	Amplifiers — Electrical engineering	.644	Ion spectrometers, e.g.
.274		Interferometers		520.644.07 Space-probe ion spectrometers
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520.8	TECHNIQUES OF OBSERVATION, MEASUREMENT AND ANALYSIS		<i>For astrometric instruments</i> →520.4
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520.8.05	Kinds of receiver →520.3 Auxiliary instruments. Recording instruments		521.314:523.64 Determination of orbits of comets
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.824	Two-colour systems	.135	Restricted 3-body problem
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.4	(P,V) _E	.143/.143.5	Particular figures [<i>cancelled</i>]→521.14
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.2	UBV	.17	Special problems
.4	RGU	.172	Planetary theory (mutual perturbations important)
.9	Other three-colour systems	.174	Lunar theory (perturbations by distant third body important)
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.31	Specification of orbits. Orbital elements and parameters	.87	Occultations by comets <i>Occulted bodies may be denoted by colon combination with the subdivisions of 523/524</i>
.312/.312.8	Orbital motion etc [<i>cancelled</i>]→52–323.8, 521.31	.89	Computation of rising, setting and local transit phenomena
.313	Elliptical orbits	521.9	ASTROMETRY. SPHERICAL ASTRONOMY. SYSTEMS OF COORDINATES, UNITS, CONSTANTS, TIME-SCALES
.314	Parabolic and hyperbolic orbits	.91	Coordinate and time systems in general
.32	Initial orbit determination	.92	Theory, determination and constants of precession and nutation (forced nutation)
.322	Geocentric orbits	.921	Precession constant
.324	Heliocentric orbits	.93	Theory and determination of Earth rotation and polar motion
.326	Planetocentric orbits	.931/.931.5	Investigations of the causes. Properties, Influences etc [<i>cancelled</i>]→52–3, 523.3/.4
.328	Binary star orbits. Orbits of visual binaries	.932	Determination of time by astronomical observations
.33	Determination by four observations [<i>cancelled, superfluous</i>]	.933	Irregularity of the Earth's rotation
.34	Variations of the elements of the orbit [<i>cancelled</i>]→521.31	.934	Time-scales. Systems of time reckoning
.35	Orbit improvement 521.35 $\cong$ 521.32, <i>e.g.</i> 521.352 Improvement of geocentric orbits	.936	Latitude determination from astronomical observations
.36	Application of the method of least squares (compensatory analysis) [<i>cancelled</i>]→528.14	.937	Movement of terrestrial poles. Variations of latitude and longitude
.37/.38	Equations [<i>cancelled, superfluous</i>]	.938	Time and latitude services
.4/.45	Perturbations [<i>cancelled</i>]→521.16/.17	.94	System of astronomical constants
.5	Orbital motion of planets [<i>cancelled</i>] <i>use</i> 523.4–323.8 or 523.4:521.1/.3	.95	Reduction of astrometric observations
.6	Orbital motion of satellites or moons [<i>cancelled</i>] <i>use</i> 523.4–87–323.8 or 523.4–87:521.1/.3	.96	Fundamental position and proper-motion systems <i>Further particulars may be denoted by alphabetic extension [Table I(h)], e.g.</i> 521.96 FK4 FK IV system N30 N30 system
.7	Theory of comets [<i>cancelled</i>] <i>use</i> 523.64–325 or 523.64:521.1/.3; <i>for motion of meteors, meteorites, use</i> 523.68–325 or 523.68:521.1/.3		Observational (instrumental) corrections →520.25 Astrometric instruments 520.4 Measuring instruments normally used separately from telescopes
521.8	ASTROMETRIC ASPECTS OF ECLIPSES, TRANSITS AND OCCULTATIONS →520.86 Techniques for observations made during eclipses, transits and occultations	.97	Calculation of ephemerides Practical astronomy [<i>cancelled</i>]→520, 521.8/.9 Observatories [<i>cancelled</i>]→520.1 Telescopes [<i>cancelled</i>]→520.2 Meridian instruments. Other instruments [<i>cancelled</i>]→520.25; sextants [<i>cancelled</i>]→629.1.053.15 <i>but cf</i> 529.74 Auxiliary instruments and apparatus [<i>cancelled</i>]→520.3 Spherical astronomy. Sources of error and corrections [<i>cancelled</i>]→521.8/.9
.81	Eclipses of the Sun and Moon	.98	THE SOLAR SYSTEM <i>For celestial mechanics, theories of motion of bodies</i> →521 <i>For astrometric aspects of eclipses, transits, occultations</i> →521.8 <i>Properties, processes etc may be denoted by the special auxiliaries listed under 52 (but with certain extensions under 523.4), e.g.</i> 523–52 Cosmogony. Origin of solar system →524.8 The universe. Metagalaxy. Cosmology
.83	Satellite and ring phenomena	522	Astrophysics [<i>cancelled</i>] <i>use</i> 523–1/–8, 523:53 Astrochemistry [<i>cancelled</i>]→52–36, 524.86
.832	Eclipses of a satellite by its planet <i>Further particulars may be denoted by colon combinations, e.g.</i> 521.832:523.45–87*1 Eclipses of Io by Jupiter	.1/.15 .2/.29 .3/.47	
.834	Transits and occultations of satellites over and by planets	.5/.62	
.835	Mutual phenomena of satellites	.7/.983.4	
.837	Ring phenomena	523	
.84	Transits of planets across the Sun		
.841	Transits of Mercury		
.842	Transit of Venus		
.3	Delisle's method		
.4	Halley's method		
.85	Occultations by the Moon <i>Occulted bodies may be denoted by colon combination, e.g.</i> 521.85:523.44 Occultations of asteroids, <i>e.g.</i> of Ceres :524.354.4 Occultations of pulsars		
.86	Occultations by planets and their satellites, and by minor planets <i>Occulted bodies may be denoted by colon combination with the subdivisions of 523/524</i>		

523.07	Astrobiology [<i>cancelled</i>]→573.5	523.31	523.31–852–35“414.22” Light of the night sky
.1	Universe. System of the world [<i>cancelled</i>]→524, especially 524.8 and use special auxiliaries listed under 52	(<i>contd.</i>)	→524.827 Sky-background radiation
.11	Structure of the universe [<i>cancelled</i>]→524.8; stellar current [<i>cancelled, superfluous</i>] but→524.6–34	.32	Temperature. Light. Radiation. Phases etc (of the Moon) [<i>cancelled</i>] use 523.34–1/–8
.12	Hypotheses on the origin and future of the universe [<i>cancelled</i>]→523–52, 524.8	.33	Orbit and movements [<i>cancelled</i>] use 523.34–325
.13	Plurality of worlds [<i>cancelled, meaningless</i>] but→114	.34	Moon. Selenology
.14/.15	“Empty” (interstellar or interplanetary) space. Cosmic medium etc [<i>cancelled</i>]→523.6, 524.5; for motion in a resisting medium→521.16; for contraction of orbits→Subdivisions of 523 and use –32 listed under 52		→521.81 Eclipses of the Sun and Moon
.16	Various cosmic phenomena [<i>cancelled</i>]; for cosmic dust→524.57; for absorption→524.572–657; for cosmic rays→524.1; for radioastronomy→52–77; also use –77 at subdivisions of 523/524, e.g. 523.9–77 for solar radio phenomena; but→520.27, 520.8, 523.985.7–77		Further particulars may be denoted by the special auxiliaries listed under 52 and 523.4 e.g.
.17	Force of repulsion [<i>cancelled</i>]→521.1	.341/.37	523.34–3 Properties and phenomena of the Moon
.18	Various world systems [<i>cancelled</i>]→524.8 or use 52(091)A/Z	.38	–355 Spectrum of the Moon
523.2	GENERAL PROPERTIES OF THE SOLAR SYSTEM	.39	–36 Chemical composition of the Moon
.21	Laws of planetary distribution		–8 Parts and features of the Moon
.212	Bode’s Law		–83 Surface of the Moon
.214	Stability of planetary configurations. Resonance orbits		–834 Mountains, craters, rills of the Moon
	→521.13 General problems — Celestial mechanics		Selenography etc. Properties, processes [<i>cancelled</i>] use 523.34–1/–8
.23	Conjunctions and oppositions		Eclipses [<i>cancelled</i>]→521.81
.231	Observations of minor planets at opposition etc [<i>cancelled</i>] →523.44 and use subdivisions of –3 listed under 52		Lunar maps and photographs [<i>cancelled</i>] use 523.34(084)
.24	Motion of the Solar System in space	523.4	PLANETS AND THEIR SATELLITES. PLANETOLOGY
	For astrometric effects→521.9		
.247	Apical coordinates [<i>cancelled</i>]→521.18		Special auxiliary subdivisions for 523.4
.25/.26	Constitution of the planetary system. Stability etc [<i>cancelled</i>] use 523–3, 523–5, especially–55	523.4–1/–8	Properties, processes, parts etc
.28	Planetarium [<i>cancelled</i>]→520.98; for gyroscopes→53.082.16 or use 681.2.086.16, 681.7.086.16		523.4–1/–8 ≅ 52–1/–8 with certain extensions
.29	Zodiac etc [<i>cancelled</i>]→133.52	–1	Mode of treatment
523.3	MOON. EARTH-MOON SYSTEM	–126	Search(es)
	Further particulars may be denoted by the special auxiliaries listed under 52 and 523.4, e.g.	–128	Discovery
	523.3–338 Age of Earth-Moon system	–327	Rotation
	–52 Origin and formation of Earth-Moon system	–332	Dimensions and shape parameters
.31	The Earth as an astronomical body	–333	Mass
	→550.3 Geophysics	–335.3	Density
	Further particulars may be denoted as at 523.3, e.g.	.5	Pressure. Surface pressure
	523.31–333 Mass of the Earth	.7	Temperature
	–383 Seasons, seasonal phenomena of the Earth	–35	Radiation emitted
	→“32” Seasons — Common auxiliaries of time [Table I(g)]	–355	Spectrum
	–423.3 Tides on the Earth (or use 523.31:521.16)	–36	Chemical composition. Abundances
	–827 Crust of the Earth	–42	Interaction between planets and their satellites
	–852 Atmosphere of the Earth	–423.3	→523.214 Stability of planetary configurations
		–52	Tides
		–56	Origin. Formation. Cosmogony
		–77	Variability
		–8	Radio emission
		–82	Parts and features of planets
		–823	Interior
		–825	Core
		–827	Mantle
		–83	Crust. Subsurface region
		–1/–83	Surface. Surface features
			Further particulars may be denoted by combining auxiliaries, e.g.
			523.4–83–335.7 Surface temperatures
			–652 Albedo (light-reflecting power of surface)
		–834	Solid features
		.2	Mountains
		.4	Craters
		.5	Rills. Clefts. Valleys
		.8	Plains. Maria

523.4–836	Oceans	523.46	Saturn
–85	Exterior		<i>Further particulars may be denoted as under</i>
–852	Atmosphere		523.45, e.g.
	<i>Further particulars may be denoted by combining auxiliaries, e.g.</i>		523.46–862 Rings of Saturn
523.4–852–335.3	Density of atmosphere		–87 Satellites of Saturn
–335.7	Temperature of atmosphere	.47	Uranus
–36	Chemical composition of atmosphere		<i>Further particulars may be denoted by special or common auxiliaries, e.g.</i>
.2	Clouds	.48	523.47(091) History of Uranus
.4	Belts	.481	Neptune. Pluto, Hypothetical planets [<i>cancelled</i>] heading <i>superfluous</i>
.6	Spots. Disturbances	.482	Neptune
–853	Ionosphere	.483	Pluto
–854	Magnetosphere. Radiation belts		Other extra-Neptunian planets
–86	Surroundings. Circum . . .	.489	[<i>cancelled</i>]→523.489
–87	Satellites	.49	Hypothetical planets
			Tables, photographs, atlases of planets
Principal divisions (continued)			[<i>cancelled</i>] use 523.4(084)
523.41/.43	Terrestrial, interior planets	.5	Meteors Meteoric showers. Zodiacal light
.41	Mercury		[<i>cancelled</i>]→523.68 etc
.42	Venus	.51/.57	Meteors etc [<i>cancelled</i>]→523.68/.684
.43	Mars	.58	Height of the atmosphere from observations of meteors [<i>cancelled</i>] use 551.510.53:523.68–13 or 52–852:523.68–13
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 523.4, and by alphabetic extension [Table I(h)], e.g.</i>	.59	Zodiacal light [<i>cancelled</i>] use 523.62–65 but→551.521.3, 551.593
523.43–834	Solid surface features of Mars	523.6	INTERPLANETARY MEDIUM. COMETS.
–834.5	Rills. “Rivers”. Canals		METEORS. METEORITES
–852	Atmosphere of Mars	.61	Occurrence and development (comets)
–852.2	Clouds	.62	[<i>cancelled</i>]→523.64–3
–87	Satellites of Mars		Interplanetary medium
–87	DEIMOS Deimos		<i>Further particulars may be denoted by the special auxiliaries listed under 52, e.g.</i>
–87	PHOBOS Phobos		523.62–337 Magnetic field. Interplanetary magnetic field
.44	Minor planets (asteroids, planetoids)		–65 Zodiacal light
	<i>Individual minor planets may be denoted by alphabetic or non-decimal numeric subdivision [Table I(h)], using name or IAU authorized number preceded by an asterisk, e.g.</i>		–726 Interplanetary plasma. Solar wind
523.44 EROS	} The minor planet Eros	.63	Orbits (comets) [<i>cancelled</i>] use 523.64–323.8
523.44*433		.64	Comets
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 523.4 e.g.</i>		→521.87 Occultations by comets
523.44–32	Position, distribution, motion of minor planets		523.683:523.64 Meteor showers, relation ships with comets
.441/.442	Particular minor planets [<i>cancelled</i>]→instruction under 523.44		<i>Individual comets may be denoted by alphabetic or non-decimal numeric subdivision I [Table I(h)], using name or IAU authorized number preceded by an asterisk, e.g.</i>
.45/.48	Outer planets		523.64 KOHOUTEK
.45	Jupiter		523.64*1973f } Kohoutek
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 523.4 and by Arabic numerals equivalent to Roman numeral designation authorized by the International Astronomical Union, preceded by an asterisk, e.g.</i>		*1974V
523.45–77	Radio emission from Jupiter		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 523.4 and by the common auxiliaries, e.g.</i>
–77–56	Variability in radio emission		523.64–126 Searches for comets
–77–56–425	Electromagnetic interactions		–128 Discoveries of comets
–77–56–425:523.45–87*1	Influence of Io		–14(083.8) Catalogues of comets
–852.4	Belts		(084) Atlases and charts of comets
–852.6	Red spot. Other disturbances		–333 Mass of comet
–87	Satellites of Jupiter		–82 Coma (head of a comet)
–87*1	Io (Satellite I of Jupiter)		–823 Nucleus of comet
			–864 Tail of comet
			–332 Shape of tail
			–355 Spectrum of tail

523.642	Periodic comets	523.84	Variable stars, temporary, double, multiple, new and lost stars [<i>cancelled</i>]→524.33/.38
.644	Aperiodic comets	.85	Stellar clusters. Nebulae. Milky way [<i>cancelled</i>]→524.4/.6
.65	Ephemerides [<i>cancelled</i>] <i>use</i> 523.64(059.3);→521.98 523.64–14(083.8)	.87	Spectra of stars and nebulae [<i>cancelled</i>] <i>use</i> 524.3–355, 524.5–355
.66	Constitution: of nucleus, of head, of tail [<i>cancelled</i>]→523.64–82/–864	.88	Constellations [<i>cancelled</i>]→133.52, 524.3 and <i>instruction under</i> 524: <i>for origin, use</i> 524.3–52
.67	Spectrum [<i>cancelled</i>] <i>use</i> 523.64–85–355	.89	Catalogues [<i>cancelled</i>]→524.3(083.8)
.68	Meteors. Meteoroids. Meteorites →552.6 Meteorites — Geology <i>Further particulars may be denoted by the special auxiliaries listed under</i> 52 and 523.4 <i>e.g.</i> 523.68–335.7 Temperature of meteors etc –35 Radiation from meteors etc –36 Chemical composition of meteors etc	.9	Transits and occultations [<i>in</i> BS 1000:Vol. 2 — Part 1:1943 — <i>cancelled</i>]→521.8, 520.86
.681	Meteorites (meteor remnants on the Earth's surface) <i>Further particulars may be denoted by the special auxiliaries listed under</i> 52 and 523.4 <i>e.g.</i> 523.68–36 Chemical composition of meteorites: traces of organic chemicals	523.9	THE SUN. SOLAR PHYSICS →520.24 Solar instruments 523.62–726 Interplanetary plasma. Solar wind 550.2 Geoastronomy. Cosmogonic theories. Cosmic influence and actions <i>Further particulars may be denoted by colon combination, e.g.</i> 523.9:520.86 Observations of the Sun during eclipses :520.876 Observations of the Sun from space
.2	Aerolites	Special auxiliary subdivisions for 523.9	
.4	Siderolites	523.9–1/–8	Properties, processes, parts of the Sun 523.9–1/–8 $\cong$ 52–1/–8 <i>with extended meaning at</i> –847
.5	Siderites	–327	Solar rotation
.8	Meteorite craters	–33	Physical properties: dimensions etc
.682	Meteors. Meteoroids. Shooting stars	–333	Mass
.2	Meteor trains <i>Further particulars may be denoted by the special auxiliaries listed under</i> 52 and 523.4, <i>e.g.</i> 523.682.2–355 Spectra of meteor trains	–335.7	Temperature
.4	Bolides (exploding meteoroids)	–355	Spectrum
.7	Fireballs (bright meteoroids)	–36	Chemical composition. Abundances
.683	Meteor showers <i>Further particulars may be denoted by colon combination, e.g.</i> 523.683:523.64 Relationships with comets	–464	Convection
.1	Radiants	–466	Turbulence
.2	Periodic showers	–47	Atomic processes
.684	Tektites. Australites. Moldavites →552.64 Tektite. Australite — Geology <i>Further particulars may be denoted by the special auxiliaries listed under</i> 52 and 523.4, <i>e.g.</i> 523.684–36 Chemical composition of tektites, australites, moldavites –52 Origin of tektites, australites, moldavites	–48	High-energy processes
.69	Tables of comets [<i>cancelled</i>]→523.64–14(083.8)	–52	Origin. Formation (of the Sun) <i>For the origin of the Solar System</i> →523–52
.7	The Sun [<i>cancelled</i>]→523.9	–7	Radiation. Solar radiation
.71/.73	Constants, dimensions, heat, light, motion etc [<i>cancelled</i>]→523.9–1/–8	–739	Extreme ultraviolet radiation (XUV) <i>Further particulars may be denoted by combining auxiliaries, e.g.</i> 523.9–739–355 XUV spectrum
.74	Surface of the Sun. Photosphere. Solar activity etc [<i>cancelled</i>] <i>use</i> 523.9–83;→523.942, 523.98	–8	Parts and features of the Sun <i>For parts and features other than those at</i> 523.9–846/→847, →523.92/.98
.75	Prominences. Chromosphere. Solar corona etc [<i>cancelled</i>]→523.945/.947	–846	Apparent disc
.76/.77	Physical constitution. Spectra etc [<i>cancelled</i>]→523.9–33, 523.9–355	–847	Apparent edge. Limb
.78	Eclipses [<i>cancelled</i>]→521.81	Principal divisions (continued)	
.79	Sun charts, atlases, photographs [<i>cancelled</i>] <i>use</i> 523.9(084)	523.91/.96	Transits of Mercury, of Venus [<i>in</i> BS 1000:Vol. 2 — Part 1:1943 — <i>cancelled</i>]→521.841/.842
.8	Stars. Stellar astronomy [<i>cancelled</i>]→524	523.92	Solar interior
.801	Theoretical works [<i>cancelled</i>] <i>use</i> 524.16	.923	Core
.802	Stellar statistics [<i>cancelled</i>] <i>use</i> 524–14	.927	Convective zone
.81/.83	Observations. Magnitudes. Proper motions etc [<i>cancelled</i>]→524.3–1/–8 <i>but</i> →521.1/.3, 521.9	.94	Quiet Sun
		.942	Photosphere
		.3	Granulation
		.4	Supergranulation
		.945	Chromosphere and chromosphere-corona transition <i>Further particulars may be denoted by the special auxiliaries listed under</i> 52 and 523.9, <i>e.g.</i> 523.945–46 Dynamics of chromosphere etc

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524.3–75	Visual rays. Light emission	524.334	Semi-regular variables
–76	Infra-red rays	.335	Miscellaneous variables
–77	Radio emission	.2	RV Tauri stars
–78	Waves in plasma	.4	Beta Cephei stars
–8	Parts and features	.6	Delta Scuti stars
–82	Interior. Internal constitution	.8	Alpha Canum Venaticorum stars
–852	Atmosphere	.336	Long-period variables. Mira stars. Me stars
–86	Circumstellar regions		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3 e.g.</i>
–87	Companions. Invisible companions		524.336–852 Atmospheres of long-period variables
Principal divisions (continued)			
524.31	Simple stars. Stars according to luminosity and spectral type	.3	Short-period Me stars
Special auxiliary subdivisions for 524.31			
524.31.01/.08	Stars according to luminosity class	.7	Irregular red variables
.01	Supergiant stars	.337	Novae. Explosive and eruptive variables
.013	Class Ia stars		→524.35 Supernovae and related objects
.017	Class Ib stars		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>
.02	Giant stars		524.337–565 Explosion mechanisms of novae etc
.022	Class II stars	.2	Novae (new or temporary stars)
.026	Class III stars	.4	Recurrent novae. T Coronae Borealis stars
.04	Subgiant stars. Class IV stars	.7	Dwarf novae
.08	Dwarf and subdwarf stars. Main sequence stars. Class V stars	.73	U Geminorum stars
.082	Dwarf stars	.77	Z Camelopardalis stars
.084	White dwarf stars	.338	Special variable stars
	→524.354.7 White dwarf stars (as supernovae remnants)	.2	Shell stars. Envelope stars
.087	Subdwarf stars		→524.37 Planetary nebulae
Principal divisions (continued)			
524.312/.318	Stars according to spectral type	.3	Symbiotic variables. Symbiotic stars
.312	Early-type stars	.5	Nebular variables. T Tau stars
	<i>For W Virginis stars</i> →524.333.7	.6	Flare stars
.3	O stars		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>
.7	B stars		524.338.6–77 Radio emission from flare stars. Radio observations
.314	A and F stars	.7	R Coronea Borealis stars
.3	A stars	.35	Supernovae and related objects. Peculiar stars
	<i>For peculiar A stars</i> →524.338.3		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>
.7	F stars		524.35–121 Unidentified or unclassifiable objects believed to lie in the Galaxy
.316	Late-type stars		–76–121 Unidentified infra-red objects believed to lie in the Galaxy
.2	G stars	.352	Supernovae
.4	K stars		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>
.7	M stars		524.352–44 Disintegration processes of supernovae
	<i>Further particulars may be denoted by the special auxiliaries listed under 524.31, e.g.</i>	.3	Type I supernovae
	542.316.7.022 M giant stars	.7	Type II supernovae
	.082 M dwarf stars	.354	Objects believed to be supernovae remnants
.318	Other (non-main-sequence) classes of star		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>
.2	S stars		524.354–423 Gravitational collapse of supernovae remnants
.4	R stars	.2	Crab nebula
.7	N stars		<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>
.33	Variable stars. Intrinsic variables		524.354.2–62 Emission mechanism of Crab nebula
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>		
	524.33–56 Variability of variable stars		
	–56–13 Observations of period of variability		
	–563 Pulsation theory		
.331	Pulsating variables in general		
.332	RR Lyrae stars		
.333	Cepheids		
.3	Classical cepheids		
.7	W Virginis stars. Type II cepheids		

524.354.2 (contd.)	524.354.2–735 X-ray radiation from Crab nebula	524.45	Open clusters. Galactic clusters
	–77 Radio radiation from Crab nebula		<i>Further particulars may be denoted by colon combination, e.g.</i>
.4	Pulsars		524.45:520.828 Isodensitometry of open star clusters
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>		:520.826.2 UBV photometry of open star clusters
	524.354.4–327 Rotation of pulsars		<i>Individual clusters may be denoted in accordance with the catalogue of Alter et al. or by catalogue designations (M, NGC or IC) or by name using alphabetic extension [Table I(h)].→note under 524</i>
	–563 Pulsation processes of pulsars		<i>Examples:</i>
	–62 Emission mechanism of pulsars		524.45 HYADES The Hyades
	–77–56 Radio observations of periodicity of pulsars		524.45 IC1805 IC 1805
.6	Neutron stars		524.45 IC1805:520.826.2 UBV photometry of IC 1805
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>		524.45 M67 M 67
	524.354.6–423 Gravitational collapse of neutron stars		524.45 NGC188 NGC 188
.7	White dwarf stars (as supernovae remnants)		524.45 PLEIADES:524.5 The Pleiades
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>		524.45 PLEIADES:524.5 Interstellar matter in the Pleiades
	524.354.7–355 Spectra of white dwarf stars		524.45–323.3 Distance of open star clusters
.355	Other objects believed to be disintegrating or collapsing		–333 Mass of open star clusters
	→524.3–52 Origin. Formation. Protostars		–338 Age of open star clusters
.358	Wolf-Rayet stars		–338 NGC188 Age of NGC 188
.37	Planetary nebulae		–36 Chemical composition of open star clusters
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>		–36 NGC 188 Chemical composition of NGC 188
	524.37–857 Extended atmospheres of planetary nebulae	.47	Globular clusters
.38	Double and multiple stars. Binary systems		<i>Further particulars may be denoted by colon combination and by the special auxiliaries listed under 52, e.g.</i>
.382	Double stars (optical or visual doubles)		524.47:524.332 RR Lyrae stars in globular clusters
	<i>Further particulars may be denoted by the common auxiliaries of form [Table I(d)], e.g.</i>		524.47–54 Dynamical evolution of globular clusters
	524.382(083.8) Catalogues of visual double stars	524.5	INTERSTELLAR MEDIUM. NEBULAE (GALACTIC)
	(084.4) Atlases of visual double stars	.52	Interstellar gas
.383	Visual binary systems	.522	HI regions
	→521.328 Binary star orbits. Orbits of visual binaries	.523	HII regions
	<i>For improvement of orbits of visual binaries, use 521.358</i>	.527	Interstellar molecules
.384	Spectroscopic binary systems	.3	Diffuse clouds
.386	Eclipsing binary systems	.7	Dense clouds
.387	Close binary systems. Very close binary systems	.54	Emission nebulae
	<i>Further particulars may be denoted by the special auxiliaries listed under 52 and 524.3, e.g.</i>	.57	Interstellar dust
	524.387–423 Gravitational changes in close and very close binary systems	.572	Diffuse interstellar dust
	.3 Tidal interactions		<i>Further particulars may be denoted by the special auxiliaries listed under 52, e.g.</i>
	.4 Mass-flow		524.572–335.7 Temperature of diffuse interstellar dust
	–54 Evolution of close and very close binary systems		–36 Chemical composition of diffuse interstellar dust
	–55 Stability of close and very close binary systems		–65 Optical properties of diffuse interstellar dust
.388	Multiple stars. Multiple systems		–655 Polarization
524.4	STAR CLUSTERS AND ASSOCIATIONS		–657 Absorption
.42	Associations of stars	.575	–658 Scintillation
.423	OB associations	.577	Interstellar (dust) clouds. Dark nebulae
.426	T associations		Interstellar (dust) globules. Highly localized concentrations
			→524.3–52 Origin. Formation. Protostars