STATUTORY INSTRUMENTS

1987 No. 2070

CUSTOMS AND EXCISE

The Export of Goods (Control) Order 1987

Made - - - -	*26th November 1987*
Coming into force - -	*1st January 1988*

The Secretary of State, in exercise of powers conferred by section 1 of the Import, Export and Customs Powers (Defence) Act 1939(**1**) and now vested in him(**2**), and of all other powers enabling him in that behalf, hereby makes the following Order:

Citation, commencement and interpretation

1.—(1) This Order may be cited as the Export of Goods (Control) Order 1987 and shall come into force on 1st January 1988.

(2) In this Order, unless the context otherwise requires–

"Commissioners" means the Commissioners of Customs and Excise;

"country" includes territory;

"goods", unless otherwise specified, means both used and unused goods;

"hovercraft" has the same meaning as in section 4(1) of the Hovercraft Act 1968(**3**);

"international import certificate" means a certificate issued by the Secretary of State for the purposes of this Order or any Order revoked by this Order certifying that an importer has undertaken with the Secretary of State to import into the United Kingdom the goods specified in the certificate or to deal with them in such other manner as is authorised by a licence granted under this Order;

"importation" and "exportation" in relation to a ship or aircraft includes the taking into or out of the United Kingdom of the ship or aircraft notwithstanding that the ship or aircraft is conveying goods or passengers, and whether or not it is moving under its own power; and cognate expressions shall be construed accordingly;

"Member State" means a Member State of the European Communities;

"scheduled goods" means goods of a description specified in Schedule 1 hereto and any reference to such goods being indicated by a letter shall be taken as a reference to the goods being so indicated in Schedule 1 hereto;

(**1**) 1939 c. 69.
(**2**) *See*S.I. 1970/1537.
(**3**) 1968 c. 59.

"scheduled journey" means one of a series of journeys which are undertaken between the same two places and which together amount to a systematic service operated in such a manner that the benefits thereof are available to members of the public from time to time seeking to take advantage of it;

"ship" includes the hull or part of the hull of a ship;

"software" means one or more programmes fixed in any tangible medium of expression, "programme" means a sequence of instructions to carry out a process in, or convertible into, a form executable by an electronic computer and includes a microprogramme, and "microprogramme" means a sequence of elementary instructions, maintained in a special storage, the execution of which is initiated by the introduction of its reference instruction into an instruction register;

"technological document" means any document containing information relating to the design, production, testing or use of goods or to technologies or processes and "document" includes any record or device by means of which information is recorded or stored;

a prohibition on exportation means a prohibition on exportation from the United Kingdom and shall include a prohibition on shipment as ships' stores;

numerical references in Schedule 1 hereto to British Standards are references to the standards so numbered published by the British Standards Institution in the year indicated after such references with such amendments (if any) thereto as may have been made before the making of this Order;

references in Schedule 1 hereto to percentages of the contents of any goods are references to percentages by weight;

any description of goods in Group A of Part I of Schedule 1 hereto in relation to a Combined Nomenclature heading or sub-heading, other than one covering a whole heading, shall be taken to comprise all goods which would be classified under an entry in the same terms constituting a subheading in the relevant heading in the Combined Nomenclature of the European Economic Community(**4**).

Prohibitions and restrictions on exportation

2. Subject to the provisions of this Order–

(i) scheduled goods indicated by the letter "A" are prohibited to be exported to any destination;

(ii) scheduled goods indicated by the letter "T" are prohibited to be exported to any destination except that when in relation to such goods the provisions of Regulation (EEC) 1062/87, as amended(**5**), relating to the use of Community transit documents requiring anything to be done at or before the time of exportation have been complied with, the goods may be exported to a destination in another Member State;

(iii) scheduled goods indicated by the letter "E" are prohibited to be exported to any destination except a destination in another Member State;

(iv) scheduled goods consisting of classes of ships indicated by the letter "S" are prohibited to be exported to any destination after delivery or for the purpose of delivery, directly or indirectly, to a person in Afghanistan, Albania, Bulgaria, China, Czechoslovakia, the German Democratic Republic, Hungary, Mongolia, North Korea, Poland, Romania, the Union of Soviet Socialist Republics or the Socialist Republic of Vietnam;

(**4**) See Council Regulation (EEC) No. 2658/87 O.J. No. L256, 7.9.87, p.1.
(**5**) O.J. No. L107, 22.4.87, p.1, amended by Regulation (EEC) 2823/87 (O.J. No. L270, 23.9.87, p.1).

(v) scheduled goods indicated by the letter "I" are prohibited to be exported to any destination in Iran or Iraq;

(vi) scheduled goods indicated by the letters "E (S)" are prohibited to be exported to any destination except that when in relation to such goods the provisions of Regulation (EEC) 1062/87, as amended, relating to the use of Community transit documents requiring anything to be done at or before the time of exportation have been complied with, the goods may be exported to a destination in another Member State, other than Spain;

(vii) scheduled goods indicated by the letters "E(PS)" are prohibited to be exported to any destination except that when in relation to such goods the provisions of Regulation (EEC) 1062/87, as amended, relating to the use of Community transit documents requiring anything to be done at or before the time of exportation have been complied with, the goods may be exported to a destination in another Member State, other than Portugal or Spain;

(viii) scheduled goods indicated by the letter "L" are prohibited to be exported to any destination in Libya;

(ix) scheduled goods indicated by the letter "Z" are prohibited to be exported to any destination in South Africa or Namibia;

(x) all goods in relation to the export of which from any country an international import certificate has been issued and which have been imported into the United Kingdom are prohibited to be exported to any destination;

(xi) specialised components of any of the apparatus, appliances or equipment falling within a description in Group 1 of Part II of Schedule 1 hereto, whether or not such components are specified in the description, are prohibited to be exported to any destination in South Africa or Namibia;

(xii) goods of a description specified in Group C of Part I of Schedule 1 hereto are prohibited to be exported to any destination in the United States of America or the Commonwealth of Puerto Rico;

(xiii) technological documents, other than documents generally available to the public, and other than applications for the grant of patents (or any other forms of protection for inventions) or for the registration of designs, in either case under the law of the United Kingdom or of any other country or under any treaty or international convention, and documents necessary to enable such applications to be filed, or made and pursued, the information contained in which relates to any goods specified in Groups 1 to 3 of Part II of Schedule 1 hereto or to any goods, technologies or processes specified in Group 4 of Part II of Schedule 1 hereto are prohibited to be exported to any destination in any country specified in paragraph (iv) above;

Community steel products

3. The prohibition in article 2 (xii) of this Order shall not apply to any exportation to any destination in the United States of America or the Commonwealth of Puerto Rico in accordance with a European Community export licence issued by the competent authority of a Member State in conformity with the provisions of Commission Decision 2873/82/ECSC(**6**) or Commission Regulation (EEC) No. 2874/82(**7**) or Commission Regulation (EEC) No. 61/85(**8**).

(**6**) O.J. No. L307, 1.11.1982, p.36, amended by Commission Decisions 2149/84/ECSC (O.J. No. L202, 31.7.84, p.1) and 978/86/ECSC (O.J. No. L91, 7.4.86, p.49).

(**7**) O.J. No. L307, 1.11.1982, p.56, amended by Commission Regulations (EEC) 2150/84 (O.J. No. L202, 31.7.84, p.23) and 977/86 (O.J. No. L91, 7.4.86, p.1).

Exceptions

4. Nothing in article 2 of this Order shall be taken to prohibit the exportation of–**Licensed exports and permitted ships' stores**

(a) any goods under the authority of a licence granted by the Secretary of State, or the shipment of any goods as ships' stores with the permission of the proper officer of Customs and Excise at the port of departure for use on board the ship, provided that all conditions attaching to the said licence or the said permission are complied with;**Channel Islands**

(b) any goods other than goods of a description included in Group B of Part I of Schedule 1 hereto or in Group 1 of Part II of the said Schedule, to any destination in the Channel Islands;**Samples**

(c) trade samples of any goods, except goods of a description included in Groups 1 and 2 of Part II of Schedule 1 hereto, if the samples have no saleable value;**Aircraft**

(d) (i) any aircraft which is being exported after temporary importation into the United Kingdom, provided that there has been no change of ownership or registration since such importation;

(ii) any aircraft engaged on a scheduled journey;**Cocoa**

(e) cocoa beans, whole or broken, raw or roasted, and the following cocoa products namely cocoa paste (in bulk or block) whether or not defatted, cocoa butter (fat and oil) and cocoa powder not containing added sugar or other sweetening matter to any destination if there is produced to the proper officer of Customs and Excise at the place of export the appropriate certificate prescribed for this purpose by the economic and control rules of the International Cocoa Agreement 1986(**9**) which were adopted by the International Cocoa Council on 23rd January 1987;**Firearms and ammunition**

(f) firearms and ammunition to any destination other than a destination in South Africa or in Namibia, not being goods of a description included in Group B of Part I of Schedule 1 hereto, authorised to be held by a valid firearm certificate or shot gun certificate granted or having effect as if granted under the Firearms Act 1968(**10**) or by a valid firearm certificate granted in Northern Ireland under the Firearms (Northern Ireland) Order 1981(**11**) or granted in the Isle of Man under the Firearms Act 1947 (an Act of Tynwald)(**12**) and forming part of the personal effects of the holder, if the certificate is produced by the holder, or his duly authorised agent, with the firearms and ammunition to the proper officer of Customs and Excise at the place of export;**Hovercraft**

(g) hovercraft engaged on a scheduled journey;**Live animals**

(h) (i) any live animal if the place of export is Great Britain;

(ii) live bovine animals, live swine and live sheep from Northern Ireland to the Republic of Ireland;**Ships**

(i) (i) any ship registered or constructed outside the United Kingdom which is being exported after temporary importation into the United Kingdom;

(ii) any ship which is departing from the United Kingdom on trials;

(iii) any ship proceeding on a normal commercial sailing.

(**8**) O.J. No. L9, 10.1.1985, p.19, amended by Commission Regulation (EEC) No. 979/86 (O.J. No. L91, 7.4.86, p.96).
(**9**) Cmnd 9905.
(**10**) 1968 c. 27.
(**11**) S.I. 1981/155 (N.I. 2).
(**12**) Acts of Tynwald 1947 p.586.

Customs powers to demand evidence of destination which goods reach

5. Any exporter or any shipper of goods which have been exported from the United Kingdom shall, if so required by the Commissioners, furnish within such time as they may allow proof to their satisfaction that the goods have reached either–

(i) a destination to which they were authorised to be exported by a licence granted for the purposes of this Order, or

(ii) a destination to which their exportation was not prohibited by this Order;

and, if he fails to do so, he shall be liable to a customs penalty not exceeding two thousand pounds unless he proves that he did not consent to or connive at the goods reaching any destination other than such a destination as aforesaid.

Offences in connection with applications for licences, etc.

6. If for the purpose of obtaining any international import certificate or of obtaining any licence or permission under this Order for the exportation or shipment as ships' stores of any goods or of obtaining from the Secretary of State a European Community export licence as referred to in article 3 of this Order any person makes any statement or furnishes any document or information which to his knowledge is false in a material particular or recklessly makes any statement or furnishes any document or information which is false in a material particular he shall be guilty of an offence and liable on summary conviction to a fine not exceeding two thousand pounds and on conviction on indictment to a fine or imprisonment for a term not exceeding 2 years, or to both; and any licence or permission or European Community export licence which may have been granted for the exportation or shipment as ships' stores of any goods, in connection with the application for which the false statement was made or the false document or information furnished, shall be void as from the time it was granted.

Declaration as to goods: powers of search

7.—(1) Any person who, on any occasion, is about to leave the United Kingdom shall, if on that occasion he is required to do so by an officer of Customs and Excise–

(a) declare whether or not he has with him any goods the export of which from the United Kingdom is subject to any prohibition or restriction under this Order; and

(b) produce any such goods as aforesaid which he has with him;

and such officer, and any person acting under his directions, may search that person for the purpose of ascertaining whether he has with him any such goods as aforesaid:

Provided that no person shall be searched in pursuance of this paragraph except by a person of the same sex.

(2) Any person who without reasonable excuse refuses to make a declaration, fails to produce any goods or refuses to allow himself to be searched in accordance with the foregoing provisions of this article shall be guilty of an offence and liable to a customs penalty not exceeding one thousand pounds.

(3) Any person who under the provisions of this article makes a declaration which to his knowledge is false in a material particular or recklessly makes any declaration which is false in a material particular shall be guilty of an offence and liable on summary conviction to a customs penalty not exceeding two thousand pounds and on conviction on indictment to a customs penalty of any amount or imprisonment for a term not exceeding two years, or to both.

Overlapping descriptions

8. Where any goods fall within more than one description specified in Schedule 1 hereto and at least one description is specified in Group B of Part I or in Part II and the goods are indicated in that Schedule by more than one of the letters specified in article 2 those goods shall be deemed to fall only within the prohibition in the paragraph first-mentioned in article 2 relating to the goods.

Modification and revocation of licences, etc.

9.—(1) Any international import certificate or licence granted by the Secretary of State in pursuance of article 2(x) or 4(a) or having effect as if so granted may be modified or revoked by him at any time.

(2) Any permission granted by the proper officer of Customs and Excise for the shipment of any goods as ships' stores may be modified or revoked by such officer at any time.

Revocations etc.

10. The Arms Export Prohibition Orders 1931–37(**13**) are hereby suspended and the Orders specified in Schedule 2 hereto are hereby revoked.

Alan Clarke,
Minister for Trade,
Department of Trade and Industry

26th November 1987.

(**13**) S.R. & O. 1931/413, 1937/525.

SCHEDULE 1 Article 1(2)

INDEX TO SCHEDULE 1

PART I

PART I

Group A

GOODS SPECIFIED BY REFERENCE TO HEADINGS AND SUB-HEADINGS OF THE COMBINED NOMENCLATURE ("CN")

CN Heading and Sub-heading No.	Description of Goods	
0102	Live bovine animals	A
0103	Live swine	A
010410	Sheep	A
1801	Cocoa beans, whole or broken, raw or roasted	E
ex1803	Cocoa paste (in bulk or block), whether or not defatted	E

CN Heading and Sub-heading No.	Description of Goods	
1804	Cocoa butter, fat and oil	E
ex1805	Cocoa powder, not containing added sugar or other sweetening matter, otherwise than in retail packs each of less than 3.5 kg	E
262030	Ash and residues, (other than from the manufacture of iron or steel), containing metals or metallic compounds–	E(S)
	containing mainly copper	
ex 7118	Coins of silver alloy of the United Kingdom minted before 1947, but not more than 100 years old at the date of exportation, exported in a quantity exceeding 10 in number	A
720410	—Waste and scrap metal of cast iron (ECSC)	E(PS)
	—Waste and scrap of alloy steel:	E(PS)
720421	—Of Stainless Steel (ECSC)	E(PS)
720429	—Other (ECSC)	E(PS)
720430	—Waste and scrap of tinned iron or steel (ECSC)	E(PS)
720441	—Turnings, shavings, chips, milling waste, sawdust, filings, trimmings and stampings, whether or not in bundles (ECSC)	E(PS)
720449	—Other (ECSC)	E(PS)
720450.10	—Remelting scrap ingots:	
	—Of alloy steel (ECSC)	E(PS)
7404	Copper waste and scrap	E(S)
7602	Aluminium waste and scrap	T
—7802	Lead waste and scrap	T

Group B

PHOTOGRAPHIC MATERIAL, ANTIQUES, COLLECTORS' ITEMS ETC.

Any photographic positive or negative produced more than 60 years before the date of exportation or any album or other assemblage containing such photographs, the value of which, as required by the Commissioners to be declared, is £400 or more, except any photographic positive or negative or album exported by, and being the personal property of, the manufacturer or producer thereof, or the spouse, widow or widower of that person	A
Any goods manufactured or produced more than 50 years before the date of exportation	A

except

(1) photographic positives and negatives, and albums or assemblages thereof;

(2) postage stamps and other articles of philatelic interest;

(3) birth, marriage or death certificates or other documents relating to the personal affairs of the exporter or the spouse of the exporter;

(4) letters or other writings written by or to the exporter or the spouse of the exporter; and

(5) any goods exported by, and being the personal property of, the manufacturer or producer thereof, or the spouse, widow or widower of that person.

Group C

STEEL PRODUCTS PROHIBITED TO BE EXPORTED TO THE UNITED STATES OF AMERICA OR THE COMMONWEALTH OF PUERTO RICO

The products specified in Annex I to the following Community instruments on the restriction of exports of certain steel products to the United States of America,

Commission Decision No. 2872/82/ECSC(**14**) (as amended by Commission Decision No. 3713/85/ECSC(**15**) and Commission Decision 2827/86/ECSC(**16**))

Council Regulation (EEC) No. 2870/82(**17**) (as amended by Council Regulation (EEC) No. 3709/85(**18**) and Council Regulation 2823/86(**19**)) and

Council Regulation (EEC) No. 60/85(**20**).

PART II

Note The goods in this Part are for convenience specified by reference to the classification system used by the Department of Trade and Industry for export control purposes.

(**14**) O.J. No. L307, 1.11.82, p.27.
(**15**) O.J. No. L355, 31.12.85, p.155.
(**16**) O.J. No. L262, 13.9.86, p.12.
(**17**) O.J. No. L307, 1.11.82, p.3
(**18**) O.J. No. L355, 31.12.85, p.55. See also Commission communication 86/C44/05 (O.J. C44, 26.2.86, p.4).
(**19**) O.J. L262, 13.9.86, p.1.
(**20**) O.J. No. L9, 10.1.85, p.13, amended by Council Regulation (EEC) No. 3711/85 (O.J. No. L355, 31.12.85, p.100) and corrected by O.J. No. L115, 3.5.86, p.31.

GROUP 1

Note Goods specified in the heads of this Group may also be specified in Groups 3E, 3F and 3G of this Part of this Schedule.**Military aircraft, Arms and related material, Ammunition, Military Stores and Appliances, and Security and Para-military Police Equipment**

ML1, ML2, ML3, ML16	Arms and ammunition and specially designed components and software therefor, the following– Small arms, machine guns, rifled and smooth bore guns and specially designed components therefor, the following– (a) carbines, pistols (including machine pistols), revolvers, rifles and smooth bore guns, except air weapons (other than those declared by the Firearms (Dangerous Air Weapons) Rules 1969 to be specially dangerous)	A
	(b) (b) machine guns and mountings therefor	A
	(2) Large calibre armament or weapons and projectors and military smoke producing appliances, and specially designed components and software therefor, the following– (a) cannon, guns, howitzers, military flame throwers, mortars, recoilless rifles, projectile launchers, rocket launchers and tank destroyers	A
	(b) (b) military smoke, gas and pyrotechnic projectors and appliances specially designed to produce	A

	smoke for military purposes	
	(3) Ammunition, including projectiles, for any of the weapons mentioned in heads (1) or (2) of this entry, and specially designed components and software therefor	A
	(4) Forgings, castings and semi-finished products specially designed for any of the foregoing specified in heads (1) to (3) above (inclusive)	A
ML4, ML16	Bombs, mines, missiles, rockets, torpedoes, demolition charges, pyrotechnic flare signals, apparatus designed for use therewith, and specially designed components and software therefor, the following– Bombs, torpedoes, grenades (including smoke grenades), smoke canisters, rockets, mines, missiles (guided or unguided), depth charges, fire bombs, incendiary bombs, military demolition charges, devices and kits; and pyrotechnic flare signals for military use, cartridges therefor and simulators thereof	A
	(2) Apparatus and devices specially designed for the handling, control, activation, refuelling, launching, laying, sweeping, discharging, detonation, detection or disruption of items mentioned in head (1) of this entry or of booby traps or of explosive devices	A
	(3) Military fuel thickeners specifically formulated for the purpose of producing materials which, when added to petroleum products, provide	A

	a gel-type incendiary material for use in bombs, projectiles, flame-throwers or other implements of war	
	(4) Forgings, castings and semi-finished products specially designed for any of the foregoing specified in heads (1) to (3) above inclusive	A
ML5	Fire-control equipment and range finders, and specially designed components, accessories and software therefor, the following–	
	(1) Fire-control, gun-laying, night-sighting, missile-tracking and guidance equipment	A
	(2) Range, position and height-finders, and spotting instruments, specially designed for military purposes	A
	(3) Aiming devices, electronic, gyroscopic, acoustic and optical, specially designed for military purposes	A
	(4) Bomb sights, bombing computers, gun sights and periscopes, specially designed for military purposes	A
	(5) Television sighting units specially designed for military use	A
ML6,ML16	Tanks and vehicles specially designed for military purposes, engines therefor, and specially designed components and software therefor, the following–	
	(1) Tanks, and self-propelled guns	A
	(2) Military type armed or armoured vehicles and vehicles fitted with mountings for arms	A
	(3) Armoured railway trains	A
	(4) Military half tracks	A

	(5) Military type recovery vehicles	A
	(6) Gun carriers and tractors specially designed for towing artillery	A
	(7) Trailers specially designed to carry ammunition	A
	(8) Amphibious and deep water fording military vehicles	A
	(9) Military mobile repair shops specially designed to service military equipment	A
	(10) Other vehicles specially designed for military use	A
	(11) Engines specially designed or essentially modified for military use, for the propulsion of the vehicles specified in heads (1) to (10) above (inclusive)	A
	(12) Pneumatic tyre casings, other than tractor and farm implement types, of a kind specially constructed to be bullet proof or to run when deflated	A
	(13) Forgings, castings and semi-finished products specially designed for any of the foregoing specified in heads (1) to (12) above (inclusive)	A
ML7	Toxicological agents, noxious chemicals and tear gas and related equipment, and specially designed components and software therefor, the following– Biological, chemical and radioactive materials adapted for use in war to produce casualties in men or animals or to damage crops	A
	(2) Noxious chemicals, the following– (a) Bromobenzyl cyanide	A

(b)	(b) *o* Chlorobenzylidenemalononitrile (*o* Chlorobenzalmalononitrile)	A
(c)	(c) *mono* Chloromethyl chloroformate	A
(d)	(d) 2-Chlorotriethylamine	A
(e)	(e) Dibenzoxazepine	A
(f)	(f) Dibromodimethyl ether	A
(g)	(g) Dichlorodimethyl ether	A
(h)	(h) 2:2'–Dichlorotriethylamine	A
(i)	(i) Diphenylaminechloroarsine	A
(j)	(j) Diphenylchoroarsine	A
(k)	(k) Diphenylcyanoarsine	A
(l)	(l) Ethyl NN-dimethylphosphoramidocyanidate	A
(m)	(m) Ethyldibromoarsine	A
(n)	(n) Ethyldichloroarsine	A
(o)	(o) Lewisite (chlorovinyldichloroarsine and dichlorodivinylchloroarsine	A
(p)	(p) Methyldichloroarsine	A
(q)	(q) Mustard gas (dichlorodiethyl sulphide)	A
(r)	(r) Phenylcarbylamine chloride (phenylaminocarbonyl chloride)	A
(s)	(s) Phenylacyl chloride (*w*-Chloroacetophenone)	A
(t)	(t) Phenyldibromoarsine	A
(u)	(u) Phenyldichloroarsine	A
(v)	(v) Pinacolyl methylphosphonofluoridate	A

	(w) (w) *iso* Propyl methylphosphonofluoridate	A
	(x) (x) 2:2':2" Trichlorotriethylamine	A
	(3) Equipment specially designed for the dissemination of the materials specified in heads (1) and (2) above	A
	(4) Equipment and materials specially designed for defence against and decontamination from the materials specified in heads (1) and (2) above, and for their detection and identification	A
ML8	Explosives, propellants and related substances, the following–	
	(1) Explosives as defined in section 3 of the Explosives Act 1875, except those specially designed for toys, novelty goods and display fireworks	A
	(2) Military propellants and fuels not elsewhere specified	A
	(3) Military pyrotechnics	A
	(4) Additives, precursors and stabilisers, and specially designed software, for the materials specified in heads (1) to (3) above (inclusive)	A
ML9	Naval equipment and specially designed components, accessories, attachments and software therefor, the following–	
	(1) Diesel engines of 1,500 brake horse power and over with rotary speed of 700 rev/min or over, specially designed for submarines	A
	(2) Electric motors over 1,000 brake horse power, quick reversing type, liquid cooled and totally enclosed, specially designed for submarines	A

	(3) Hull penetrators and connectors specially designed for military purposes and enabling interaction with equipment external to a vessel	A
	(4) Magnetic pressure and acoustic underwater detection devices specially designed for military use, and controls therefor	A
	(5) Non-magnetic diesel engines capable of developing 50 brake horse power and over, specially designed for military purposes	A
	(6) Submarine and torpedo nets	A
ML9	Ships of war, designed for offensive or defensive action (surface or under-water) whether or not converted to non-military use, and specially designed components, accessories, attachments and software therefor	A
ML10	Military aircraft and helicopters, of the piloted or pilotless type, aircraft or helicopter engines and aircraft or helicopter equipment and associated equipment, the following–	
	(1) Combat aircraft and helicopters and other aircraft and helicopters specially designed for military purposes and any other aircraft and helicopters having special structural features for transporting and airdropping troops, military equipment and supplies	A
	(2) Aircraft engines specially designed or adapted for use with aircraft or helicopters specified in head (1) of this entry	A
	(3) Airborne equipment specially designed for use with	A

aircraft, helicopters or engines specified in heads (1) and (2) of this entry	
(4) Apparatus and appliances specially designed for use in or with aircraft and helicopters, the following–	
(a) (a) pressurised breathing equipment and partial pressure suits	A
(b) (b) anti-g suits	A
(c) (c) military crash helmets	A
(d) (d) military parachutes	A
(e) (e) liquid oxygen converters used for aircraft, helicopters and missiles	A
(f) (f) catapults and cartridge actuated devices used in emergency escape of personnel from aircraft and helicopters	A
(5) Supply-dropping apparatus for use with aircraft specified in head (1) of this entry	A
(6) Pressure refuellers, pressure refuelling equipment, equipment specially designed to facilitate operations in confined areas and ground equipment, not elsewhere specified, developed for aircraft, helicopters or engines specified in heads (1) or (2) of this entry	A
(7) Specially designed components and software for aircraft, helicopters, engines or equipment specified in heads (1) to (5) above (inclusive)	A

ML11	Electronic equipment specially designed for military use and specially designed components and software therefor	A
ML12	Photographic and electro-optical imaging equipment, and specially designed components and software therefor, the following–	
	(1) Cameras, the following–	
	(a) (a) air reconnaissance cameras and associated equipment, designed for military purposes	A
	(b) (b) other cameras and electro-optical imaging devices designed for military purposes	A
	(c) (c) specialised equipment for the cameras and devices specified in sub-head (b) above designed to make the recorded information usable for military purposes	A
	(2) Film processing and printing machines designed for military purposes	A
ML13	Special armoured equipment and specially designed components therefor, the following–	
	(1) Armoured plate	A
	(2) Combinations and constructions of metallic or non-metallic materials specially designed to provide ballistic protection for military systems	A
	(3) Military helmets	A
	(4) Body armour, bullet-proof or bullet-resistant clothing and flak suits	A

ML14	Specialised military training equipment and specially designed components, accessories and software therefor	A
ML15	Military infra-red and thermal imaging equipment and image-intensifier equipment, and specially designed components and software therefor	A
ML17	Construction equipment built to military specifications, specially designed for airborne transport, and specially designed components and software therefor	A
ML17	Searchlight control units and specially designed components and software therefor	A
ML17	Searchlights, power-controlled, designed for military use, and specially designed components and software therefor	A
ML17	Self-contained diving and underwater swimming apparatus and specially designed components and software therefor, the following–	
	(1) Closed and semi-closed circuit (rebreathing) apparatus	A
	(2) Specially designed components for use in the conversion of open circuit apparatus to military use	A
	(3) Articles exclusively designed for military use with self-contained diving and underwater swimming apparatus	A
ML17	Silencers and telescopic sights for firearms and specially designed components and software therefor	A
ML18	Equipment specially designed for the design, examination, development, production, manufacture, testing and	A

	checking of goods specified in this Group and specially designed components and software therefor	
ML19	Environmental chambers capable of pressures below 10u2–u24 Torr, (0.133 microbar) except equipment fitted with industrial machinery not specified in this Schedule, and specially designed components therefor	A
ML20	Cryogenic and superconductive equipment and specially designed components, accessories and software therefor, the following–	
	(1) Equipment specially designed or configured for installation in a vehicle for military ground, marine, airborne or space applications and capable of operating while the vehicle is in motion and of producing or maintaining temperatures below 103 K (–170°C)	A
	(2) Superconductive electrical equipment (rotating machinery and transformers) designed for operation at temperatures below 103 K (–170°C) being equipment specially designed or configured for installation in a vehicle for military ground, marine, airborne or space applications and capable of operating while the vehicle is in motion, except direct-current hybrid homopolar generators having single-pole normal metal armatures which rotate in a magnetic field produced by superconducting windings, provided that such windings are the only superconducting component in the generator	A

ML22	Electrically triggered shutters of the carbon injection or photochromic function type having a shutter speed of less than 100 microseconds and specially designed components and software therefor, except shutters specially designed for high speed cameras	A
ML23	Directed energy weapon systems and specially designed components and software therefor, the following–	
	(1) Laser systems specially designed for the destruction or for effecting abortion of the mission of a target	A
	(2) Particle beam and microwave systems capable of the destruction or of effecting abortion of the mission of a target	A
ML24	Software not elsewhere specified, the following–	
	(1) Software specially designed for the modelling, simulation or evaluation of military weapons systems	A
	(2) Software for determining the effects of conventional, nuclear, chemical or biological warfare weapons	A
—	Security and para-military police equipment, the following–	
	(1) Acoustic devices represented by the manufacturers or suppliers thereof as suitable for riot control purposes, and specialised components therefor	A
	(2) Anti-riot shields and components therefor	A
	(3) Leg-irons, shackles (excluding handcuffs) and	A

	gangchains, specially designed for restraining human beings	
	(4) Portable anti-riot devices for administering an electric shock or an incapacitating substance, and specialised components therefor	A
	(5) Water cannon and components therefor	A

GROUP 2

ATOMIC ENERGY MINERALS AND MATERIALS, AND NUCLEAR FACILITIES, EQUIPMENT AND APPLIANCES

Note 1:Goods specified in the heads of this Group may also be specified in Group 3 of this Part of this Schedule.

Note 2:The definitions applying to crude or semi-fabricated forms are those given under Group 3H.

GROUP 2A

Atomic Energy Minerals and Materials

A1, A13	Nuclear materials, the following–	
	(1) Special and other fissile materials, the following–	A
	(a) plutonium, all istopes, alloys, compounds and any material containing any of the foregoing	
	(b) (b) uranium 233, uranium enriched in the isotopes 235 or 233, alloys, compounds and any material containing any of the foregoing	A
	(c) (c) americium –242m, curium –245 and –247, and californium –249 and –251, and any material containing the foregoing	A
	In this entry “Uranium enriched in the isotopes 235 or 233” is defined as uranium containing	

	the isotopes 235 or 233, or both, in an amount such that the abundance ratio of the sum of these isotopes to the isotope 238 is more than the ratio of the isotope 235 to the isotope 238 occurring in nature.	
A2	Source material, the following–	
	Natural and depleted uranium, in any form, or incorporated in any substance in which the concentration of uranium exceeds 0.05%	A
	(Note) (Note) "Natural uranium" is defined as uranium containing the mixtures of isotopes occurring in nature; "Depleted uranium" is defined as uranium depleted in the isotope 235 below that occurring in nature.	
—	Source material, the following–	
	Thorium, in any form, or incorporated in any substance in which the concentration of thorium exceeds 0.05%	A
A3	Deuterium, heavy water, deuterated paraffins and other organic and inorganic compounds, mixtures and solutions containing deuterium, in which the isotopic ratio of deuterium to hydrogen exceeds 1:5,000	A
A4	Zirconium in which the ratio of hafnium content to zirconium content is less than one part to five hundred parts by weight, the following–	

	(1) Zirconium and alloys containing more than 50% zirconium, in crude or semi-fabricated forms	A
	(2) Zirconium compounds, except zirconium oxide thermally stabilised with calcium oxide or magnesium oxide or both	A
	(3) Manufactures wholly of any of the foregoing	A
A5	Nickel powder having a nickel content of 99% or more and a mean particle size of less than 100 micrometers, whether compacted or not	A
A6	Graphite, nuclear grade, having a purity level less than 5 parts per million boron equivalent and with a density greater than 1.5 g/cmu23	A
A7	Lithium, the following–	
	(1) Lithium and alloys containing 50% or more of lithium, in crude or semi-fabricated forms	A
	(2) Lithium and alloys, mixtures, concentrates and compounds, containing lithium enriched in the lithium-6 isotope	A
	(3) Hydrides in which lithium, whether normal, depleted or enriched in the lithium-6 isotope, is compounded with hydrogen or its isotopes or complexed with other metals or aluminium hydride	A
	(4) Substances not specified above containing lithium enriched in the lithium-6 isotope	A
A8	Hafnium, the following–	
	(1) Hafnium and alloys containing more than 60% of	A

	hafnium, in crude or semi-fabricated forms	
	(2) Hafnium compounds containing more than 60% of hafnium	A
	(3) Manufactures of any of the foregoing	A
A9	Beryllium, the following–	
	(1) Beryllium and alloys containing more than 50% of beryllium, in crude or semi-fabricated forms	A
	(2) Beryllium compounds	A
	(3) Manufactures of any of the foregoing except metal windows for medical X-ray machines	A
—	Fluorine	A
—	Chlorine trifluoride	A
A12	Tritium, compounds and mixtures containing tritium, in which the ratio of tritium to hydrogen by atoms exceeds 1 part in 1,000, and products containing one or more of the foregoing	A
	except	
	(1) labelled compounds not exceeding 100 curies per shipment (In this entry "labelled compounds" means compounds in which one of the atoms is a different isotope from that found normally);	
	(2) luminous paint, self luminous products, gas and aerosol detectors, electron tubes, lightning or static electricity gradient meters, devices designed for the ionisation of air including static elimination devices, ion generating tubes, detector cells of gas chromatography devices, calibration standards, or apparatus and instruments not elsewhere specified in this	

	Schedule incorporating such products or devices, provided that each product or device contains not more than 40 curies of tritium in any chemical or physical form; and	
	(3) compounds and mixtures of tritium, where the separation of the constituents cannot result in the evolution of an isotopic mixture of hydrogen in which the ratio of tritium to hydrogen by atoms exceeds 1 part in 1,000.	
A13	Neptunium 237 in any form for nuclear heat sources, ...	A
A14	Specially designed or prepared materials for the separation of isotopes of natural uranium, and depleted uranium, and special and other fissile materials referred to in heads A1, A2 and A3 of this Group including specially designed chemical exchange resins	A
—	Specially designed or prepared materials for the separation of isotopes of thorium, including specially designed chemical exchange resins	A
	(For isotopic separation plants, see the entry in Group 2B relating thereto).	
—	Calcium containing both less than 100 parts per million by weight of impurities other than magnesium and less than 10 parts per million by weight of boron	A
—	Alloys containing a higher percentage of magnesium than of any other element and 10% or more of lithium	A

GROUP 2B

Nuclear Facilities, Equipment and Appliances

B1	Plants for the separation of isotopes of source material and special and other fissile materials, and specially designed or prepared equipment and components therefor, including–	
	(1) Valves wholly made of or lined with nickel, nickel alloy, phosphor bronze, stainless steel, aluminium or aluminium alloy, corrosion resistant to uranium hexafluoride (UFd26) or hydrogen fluoride (HF), 0.5 cm or greater in diameter with bellows seal	A
	(2) Units capable of separating isotopes of natural uranium, depleted uranium and special or other fissile materials, such as–	
	(a) (a) Gas centrifuges	A
	(b) (b) Jet nozzle separation units	A
	(c) (c) Vortex separation units	A
	(d) (d) Laser isotopic separation units	A
	(e) (e) Chemical exchange separation units	A
	(f) (f)Electromagnetic separation units	A
	(g) (g) Plasma separation units	A
	(h) (h) Gaseous diffusion separation units	A
	(3) Blowers and compressors (turbo, centrifugal and axial flow types) wholly made of or lined	A

	with nickel, nickel alloy, phosphor bronze, stainless steel, aluminium or aluminium alloy, corrosion resistant to uranium hexafluoride (UFd26) or hydrogen fluoride (HF) and having a capacity of 1,700 litres (1.7 mu23) per minute or greater, including compressor seals, except blowers and compressors not so defined	
	(4) Heat exchangers made of aluminium, copper, nickel or nickel alloys, separately or together, and heat exchangers incorporating tubing clad with aluminium, copper, nickel or nickel alloys, separately or together, and in which the other parts are made wholly of the foregoing metals, separately or together, designed to operate at sub-atmospheric pressure with a leak rate of less than 10 pascal (0.1 millibar) per hour under a pressure differential of 10u25 pascal (1 bar) except heat exchangers not so defined	A
	(5) Gaseous diffusion barriers	A
	(6) Gaseous diffuser housings	A
	For specially designed or prepared materials for the separation of isotopes, see the entry in Group 2A relating thereto.	
B2	Plants for the reprocessing of irradiated nuclear fuel and equipment and components specially designed or prepared therefor, or capable of being adapted for use therein, including–	A
	(1) Fuel element chopping or shredding machines	A
	(2) Criticality safe tanks (e.g. small diameter, annular or slab tanks)	A

	(3) Countercurrent solvent extractors and ion exchange processing equipment	A	
	(4) Process control equipment or instrumentation specially designed or prepared for monitoring or controlling the reprocessing or irradiated source and special and other fissile materials	A	
			(For process control equipment for lithium, see the entry in this Group relating thereto.)
B3	Nuclear reactors, i.e. reactors capable of operation so as to maintain a controlled, self-sustaining fission chain reaction, and equipment and components specially designed or prepared for use in connection with a nuclear reactor, including–		
	(1) Pressure vessels, i.e. metal or other vessels as complete units or as major shop-fabricated parts therefor	A	
	(2) Fuel element handling equipment, including reactor fuel charging and discharging equipment	A	
	(3) Control rods, including the neutron absorbing part and the support or suspension structures therefor, and control rod guide tubes	A	
	(4) Electronic controls for controlling the power levels in nuclear reactors, including reactor control rod drive mechanisms and radiation detection and measuring instruments to determine neutron flux levels	A	
	(5) Pressure tubes	A	
	(6) Coolant pumps	A	
	(7) Internals specially designed or prepared for the operation of a nuclear	A	

	reactor, including core support structures, thermal shields, baffles, core gridplates, diffuser plates	
	(8) Heat exchangers	A
B4	Plants specially designed for the fabrication of nuclear reactor fuel elements and specially designed equipment therefor	A
B5	Plants for the production or concentration of heavy water, deuterium, or deuterium compounds, and specially designed or prepared equipment and components therefor	A
B6	Plants for the production of uranium hexafluoride (UFd26) and specially designed or prepared equipment (including UFd26 purification equipment) and components therefor	A
C1	Neutron generator systems, including tubes, designed for operation without an external vacuum system and utilising electrostatic acceleration to induce a tritium-deuterium nuclear reaction	A
C2	Power generating or propulsion equipment specially designed or adapted for use with military, space, marine or mobile nuclear reactors	A
C3	Electrolytic cells for the production of fluorine, with a production capacity greater than 250 g of fluorine per hour	A
C4	Equipment specially designed for the separation of isotopes of lithium	A
	(For plants for the separation of isotopes other than lithium, see the entry for such plants in this Group.)	

C5	Equipment specially designed for the production or recovery of tritium	A
C6	Frequency changers (converters or inverters) capable of a multi-phase electrical output of between 600–2,000 Hz and specially designed components therefor for use in gas centrifuge plants	A
—	Equipment specially designed for the manufacture or assembly of gas centrifuges capable of the enrichment or separation of isotopes and specially designed parts, components and equipment therefor	A
	(For gas centrifuge plants, see the entry for plants for separation of isotopes in this Group.)	
—	Mass spectrometers and mass spectrometer sources designed for measuring the isotopic composition of uranium hexafluoride (UFd26) gas, uranium and uranyl compounds	A
—	Pressure gauges capable of measuring pressures to 100 Torr (13332.2 newtons per square metre) or less having sensing elements of nickel, nickel alloy, phosphor bronze, stainless steel, aluminium or aluminium alloy, corrosion resistant to uranium hexafluoride (UFd26) or hydrogen fluoride (HF); and such sensing elements.	A
—	Process control equipment or instrumentation specially designed or prepared for monitoring or controlling the reprocessing of irradiated lithium	A

GROUP 3

STRATEGIC GOODS NOT SPECIFIED IN GROUPS 1 AND 2

GROUP 3A

Metal Working Machinery and Associated Equipment

IL1075	Machines, spin-forming and flow-forming, specially designed or adapted for use with numerical or computer controls and specially designed components and software therefor	A
IL1080	Specially designed equipment, tooling and fixtures for the manufacture or measuring of gas turbine blades or vanes, the following–	
	(1) Blade or vane aerofoil or root automatic measuring equipment	A
	(2) Precision vacuum investment coating equipment, including core-making equipment	A
	(3) Small-hole drilling equipment for producing holes having depths more than four times their diameter and less than 0.76 mm in diameter	A
	(4) Directional solidification casting equipment and directional recrystallisation equipment	A
	(5) Segmented cast blade or vane bonding equipment	A
	(6) Integral blade-and-disc casting equipment	A
	(7) Blade or vane casting equipment, except furnaces, molten-metal baths and iron-plating baths	A
	(8) Ceramic blade or vane moulding and finishing machines	A

	(9) Moulds, cores and tooling for the manufacture and finishing of–	
	(a) (a) cast hollow turbine blades or vanes	A
	(b) (b) turbine blades or vanes produced by powder compaction	A
	(10) Composite metal turbine blade or vane moulding and finishing machines	A
	(11) Inertial blade or vane welding machines	A
	(12) Specially designed components and accessories for the equipment specified in heads (1) to (11) above (inclusive), and specially designed software for the use of the equipment, components and accessories	A
(See also the entry in Group 4 relating to technology for the use of certain blade or vane machines not specified in this entry.)		
IL1081	Equipment, tools, dies, moulds and fixtures specially designed or modified for the manufacture or inspection of aircraft, airframe structures and aircraft fasteners, the following–	
	(1) Equipment, tools, dies, moulds and fixtures for–	
	(a) (a) hydraulic stretch-forming–	
	(i) of which the machine motions or forces are digitally controlled or controlled by electrical analogue devices; or	A
	(ii) which are capable of thermal-conditioning the workpiece	A

	(b) (b) milling aircraft skins or spars	A
	(2) Tools, dies, moulds and fixtures for–	
	(a) (a) diffusion bonding	A
	(b) (b) superplastic forming	A
	(c) (c) hot die forging	A
	(d) (d) metal powder compaction by vacuum hot pressing, high pressure extrusion or isostatic pressing	A
	(e) (e) direct-acting hydraulic pressing of aluminium alloys and titanium alloys	A
	(f) (f) manufacturing, inspecting, inserting or securing specially designed high-strength aircraft fasteners	A
	(3) Specially designed components and accessories for the equipment, tools, dies, moulds or fixtures specified in heads (1) and (2) above, and specially designed software for the use of the equipment, components and accessories	A
IL1086	Equipment, tools, dies, moulds, fixtures and gauges specially designed or modified for the manufacture or inspection of aircraft and aircraft-derived gas turbine engines the following–	
	(1) Equipment, tools, dies, moulds, fixtures and gauges for–	
	(a) (a) automated production inspection	A

	(b) (b) automated welding	A
	(2) Tools, dies, moulds, fixtures and gauges for–	
	(a) (a) solid-state joining by inertial welding or thermal bonding	A
	(b) (b) manufacture and inspection of high-performance gas turbine bearings	A
	(c) (c) rolling specially configured rings such as nacelle rings	A
	(d) (d) forming and finishing turbine discs	A
	(3) Compressor or turbine disc broaching machines	A
	(4) Specially designed components and accessories for the equipment, tools, dies, moulds, fixtures and gauges specified in heads (1) to (3) above (inclusive), and specially designed software for the use of the equipment, components and accessories	A
IL1088	Machines, gear making or gear finishing, the following–	
	(1) Bevel gear making machines, the following–	
	(a) (a) gear grinding machines (non-generating type)	A
	(b) (b) other machines capable of the production of bevel gears having a diametral pitch finer than 48 (a module finer than 0.5 mm) and meeting a quality	A

	standard better than Admiralty Class I	
	(2) Machines capable of the production of gears meeting a quality standard better than British Standard 436:190 Grade 2	A
IL1091 IL1093	Machine tools and numerical control systems, the following–	
	(1) Machine tools and dimensional inspection machines equipped or capable of being equipped with numerical control systems (as specified in head (2) below)	A
	except	
	(a) (a) boring mills, milling machines and machining centres having all of the following characteristics–	
	(i) not more than three axes capable of simultaneously co-ordinated contouring motion or not more than three linear axes plus one rotary axis, but no tilting axis capable of simultaneously co-ordinated contouring motion;	
	(ii) maximum slide travel in any axis equal to or less than 3,000 mm;	
	(iii) spindle drive motor power of not more than 35 kW;	
	(iv) single working spindle;	
	(v) axial and radial axis motion measured at the spindle axis in one revolution of the spindle equal to or greater than D × 2 × 10u2–u25 mm TIR (peak to peak) where D	

is the spindle diameter in millimetres;

(vi) incremental positioning accuracy equal to or greater (coarser) than .266 0.002 mm in any 200 mm of travel; and

(vii) overall positioning accuracy in any axis equal to or greater (coarser) than–

(a) .266 0.01 mm for machines with total length of axis travel of not greater than 300 mm;

(b) .266 (0.01 + (0.0025/300 × (L-300))) mm for machines with a total length of axis travel of greater than 300 mm and not greater than 3,300 mm;

(c) .266 0.035 mm for machines with a total length of axis travel greater than 3,300 mm;

(b) (b) machine tools, other than those specified in sub-head (a) above and dimensional inspection machines having both of the following characteristics–

(i) radial-axis motion measured at the spindle axis equal to or greater than 0.0008 mm TIR (peak to peak) in one revolution of the spindle (for lathes, turning machines, contour grinding machines and similar machinery); and

(ii) meeting the requirements specified in sub-heads (a) (i), (vi) and (vii) above.

(c) (c) dimensional inspection machines, having all of the following characteristics–

(i) a linear positioning accuracy equal to or less than–

(a) .266 (3 + L/300) micrometre for L shorter than or equal to 3,300 mm;

(b) .266 14 micrometre for L longer than 3,300 mm;

(ii) a rotary accuracy of equal to or less than 5 seconds in every 90 degrees;*and*

(iii) meeting the requirements of (a)(i) above;

(Note also the entry in Group 3D relating to machine tools for generating optical quality surfaces.)

(2) Units for numerically controlling simultaneously co-ordinated (contouring and continuous path) movements of machines in two or more axes A

except those having all of the following characteristics–

(a) (a) no more than two contouring interpolating axes capable of simultaneous co-ordination;

(b) (b) minimum programmable increment equal to or greater than 0.001 mm;

(c) (c) interfaces limited as follows–

(i) no integral interface designed to meet ANSI/IEEE standard 488–1978, IEC publication 625–1, or any equivalent standard;

(ii) no more than two interfaces meeting EIA standard RS–232–C or any equivalent standard;

(d) (d) on-line (real-time) modification of the tool path, feed rate and spindle data limited to the following–

(i) cutter diameter compensation normal to the centreline path;

(ii) automatic acceleration and deceleration for starting, cornering and stopping;

(iii) axis transducer compensation including lead screw pitch compensation;

(iv) constant surface speed with or without limits;

(v) spindle growth compensation;

(vi) manual feed rate and spindle speed override;

(vii) fixed and repetitive cycles;

(viii) tool and fixture offset;

(ix) part programme tape editing, excluding source programme language and centreline location data (CLDATA);

(x) tool length compensation;

(xi) part programme storage;

(xii) variable pitch threading;

(xiii) inch/metric conversion; and

(xiv) feed rate override based on spark voltage for electrical discharge machines;

(e) (e) word size not greater than 16 bits (excluding parity bit(s));

(f) (f) software/firmware, including that of any programmable unit or device furnished, not exceeding the control unit functions specified in sub-heads (a) to (e) above (inclusive) and restricted as follows–

(i) furnishing only the following application programmes, capable of execution without further compilation, assembly, interpretation or processing (other than control unit parameter initialisation) and memory storage loading, and each supplied as an entity and not in modular form–

(a) an operating programme allowing the unit to perform its normal functions;

(b) one or more diagnostic programmes to verify control or machine performance and permit localisation of hardware malfunctions;

(c) a translator programme enabling the end user to programme the control-to-machine interface;

(ii) programme documentation for application programmes not containing the following–

(a) listing of programme instructions, other than that necessary for diagnostics for routine hardware maintenance;

(b) description of programme organisation or function beyond that required for programme use and for maintenance of hardware with which the programmes operate;

(c) flow charts, logic diagrams or the algorithms employed, other than those necessary for use of diagnostics for routine hardware maintenance;

(d) any reference to specific memory storage locations, other than those necessary for diagnostics for routine hardware maintenance;

(e) any other information about the design or function of the software which could assist in the analysis or modification of all or part of it.

(3) Direct numerical control systems (DNC) consisting of a dedicated stored-programme computer acting as a host computer and controlling, on-line or off-line, one or more of the numerically controlled machine tools or inspection machines specified in head (1) above, related software therefor and interface and communication equipment for data transfer between the host computer memory, the interpolation functions and the numerically controlled machine tools ... ... A

(4) Spindle assemblies, consisting of spindles and bearings as a minimal assembly, except those assemblies with axial and radial axis motion measured along the spindle axis in one revolution of the spindle equal to or greater (coarser) than the following ... ... A

(a) (a) 0.0008 mm TIR (peak-to-peak) for lathes and turning machines; or

(b) (b) D × 2 × 10u2–u25 mm TIR (peak-to-peak) where D is the spindle diameter in millimetres, for milling machines, boring mills, jig grinders and machining centres.

(5) Lead screws, including ball nut screws, except those having all of the following characteristics ... ... A

(a) (a) accuracy equal to or greater (coarser) than 0.004 mm/300 mm;

(b) (b) overall accuracy equal to or greater (coarser) than (0.0025 + 5 × 10u2–u26 × L) mm where L is the effective length in millimetres of the screw; and

(c) (c) concentricity of the centre line of the journal bearing surface and the centre line of the major diameter of the screw equal to or greater (coarser) than 0.005 mm TIR (peak-to-peak) at a distance of 3 times the diameter of the screw or less from the journal bearing surface.

(6) Linear and rotary position feedback units including inductive type devices, graduated scales and laser systems ... ... A

except

(a) (a) linear type units having an accuracy equal to or greater (coarser) than (0.0004 + 13 × 10u2–u26 × L) mm for L equal to or less than 100 mm and (0.0015 + 2 × 10u2–u26 × L) mm for L greater than 100 mm, where L is the effective length in millimetres of the linear measurement; and

(b) (b) rotary types having an accuracy equal to or greater (coarser) than 2 seconds of arc.

(7) Linear induction motors, used as drives for slides, A

	having all of the following characteristics:	
	(a) (a) stroke greater than 200 mm;	
	(b) (b) nominal force rating greater than 45 N; and	
	(c) (c) minimum controlled incremental movement less than 0.001 mm.	
	(8) Specially designed sub-assemblies and software capable of upgrading the capabilities of numerical control units and machine tools so that they fall within the descriptions in heads (1) to (3) above (inclusive)	A
—	Machines, internal grinding (except hand-held drills) of the kind incorporating or specially designed for the utilisation of grinding heads designed or rated for operation at speeds in excess of 120,000 revolutions per minute	A

GROUP 3B

Note. Goods specified in the heads of this Group may also be specified in Group 2 of this Part of this Schedule.

Chemical and Petroleum Equipment

IL1110,IL1145	Chemical plant and equipment, the following–	
	(1) Equipment for the production of liquid fluorine, and specially designed components therefor	A
	(2) Containers, jacketed only, specially designed for the storage and/or transportation of liquid fluorine	A
IL1129,IL1131	Pumps, the following–	

(1) Vacuum pump systems and specially designed components, controls and accessories therefor, the following–		
(a)	(a) cryopump systems in which the circulation of cooled or liquefied gas is used to achieve a vacuum, static or dynamic, by lowering the temperature of the environment, designed to operate at temperatures lower than –200°C measured at atmospheric pressure	A
(b)	(b) vacuum pump systems capable of evacuating a chamber of volume greater than 1 litre to pressures below 10u2–u28 Torr (1.3 x 10u2–u26 Pascals) while the temperature in the chamber is maintained above 800°C	A
(2) Other pumps having either of the following characteristics:		
(a)	(a) designed to move molten metals by electromagnetic forces; or	A
(b)	(b) all flow contact surfaces made of materials containing 90% or more, separately or combined, of tantalum, titanium or zirconium, except materials containing more than 97%, but less than 99.7%, titanium	A

IL1133	Pipe valves, cocks and pressure regulators, having all flow contact surfaces made of materials containing 90% or more, separately or combined, of tantalum, titanium or zirconium, except materials containing more than 97%, but less than 99.7% titanium	A
IL1142	Tubing, the following–	
	(1) Unreinforced, heat-shrinkable tubing having an inner diameter of less than 28.57 mm, before shrinkage, and made of, lined with or covered with any of the substances included in sub-head (2)(c) below	A
	(2) Reinforced tubing designed for operating pressures of 210.92 kg/cmu22 or greater, whether or not specially processed to make flow surfaces electrically conductive and made of, lined with or covered with any of the substances included in sub-heads (a), (b) or (c) below; and connectors fittings therefore:	A
	(a) (a) coagulated dispersion grades of polytetrafluoroethylene;	
	(b) (b) copolymers of tetrafluoroethylene and hexafluoropropylene;	
	(c) (c) copolymers and terpolymers composed of any combination of the monomers tetrafluoroethylene, chlorotrifluoroethylene, vinylidene fluoride, hexafluoropropylene and bromotrifluoroethylene, except the copolymers of tetrafluoroethylene	

	and hexafluropropylene.	

GROUP 3C

Electrical and Power-Generating Equipment

IL1203	Furnaces, electric, the following–	
	(1) Consumable electrode vacuum arc furnaces with a capacity in excess of 20,000 Kg	A
	(2) Skull type vacuum arc furnaces	A
	(3) Vacuum induction furnaces with a capacity greater than 2, 275 kg designed to operate at pressures lower than 6.67 Pa (0.0667 mbar) at temperatures higher than 1, 373 K (1,100°C) from which molten metal may be poured into a mould within the same vacuum chamber without breaking the vacuum	A
	(4) Induction furnaces having both of the following characteristcs:	A
	(a) (a) a diameter inside the induction coil of 155 mm or greater; and	
	(b) (b) designed to heat a workpiece with a diameter of 130 mm or more to a temperature greater than 2,273 K (2,000°C).	
	(5) Specially designed components and controls for the furnaces specified in heads (1) to (4) above (inclusive) and specially designed software for the use of such furnaces, components or controls	A

except susceptors made of graphite not elsewhere specified.

(Note exception (1) in the entry in Group 3D relating to equipment specially designed for the production of certain nickel-cobalt-or iron-base alloys.)

IL1205 Electro-chemical, semiconductor and radioactive devices for the direct conversion of chemical, solar or nuclear energy to electrical energy, the following–

(1) Electro-chemical devices of the following types–

(a) (a) fuel cells operating at temperatures of 523 K (250°C) or lower, including regenerative cells which generate electric power from consumable components all of which are supplied from outside the cell A

except, save in respect of technological documents relating thereto, those with a maximum output power of more than 10 kW which use gaseous pure hydrogen and oxygen/air reactants, alkaline electrolyte and a catalyst support by carbon either pressed on a metal mesh electrode or attached to a conducting porous plastic.

(b) (b) primary cells and batteries having any of the following characteristics–

(i) reserve (water, electrolyte or thermally activated) batteries possessing a means of activation and A

	having a rated unactivated store life of 3 years or more at an ambient temperature of 297 K (24°C)	
	(ii) utilizing lithium or calcium (including alloys in which lithium and calcium are constituents) as electrodes and having an energy density at a discharge current equal to C/24 hours (where C is the nominal capacity at 297 K (24°C) in ampere hours) greater than 250 watt-hours per Kg at 297 K (24°C) and greater than 80 watt-hours per Kg at 244 K (–29°C)	A
	(iii) using an air electrode with either lithium or aluminium counter-electrodes and having a power output of 5 Kw or more or an energy output of 5 Kw hours or more	A
except, save in respect of technological documents relating thereto, those specially designed for consumer applications in watches, pacemakers, calculators and hearing aids.		
	(c) (c) secondary (rechargeable) cells and batteries having any of the following characteristics after more than 20 charge/discharge cycles at a discharge current equal to C/5 hours (C being the nominal capacity in ampere hours)–	
	(i) utilizing nickel and hydrogen as the active constituents and having an energy density of 55	A

		watt-hours per kg (25 watt-hours per lb) or more at 297 K (24°C)	
	(ii)	utilizing lithium or sodium as electrodes or reactants and having an energy density of 55 watt-hours per kg (25 watt-hours per lb) or more at the rated operating temperature	A
	(d)	(d) molten salt electrolyte cells and batteries which normally operate at temperatures of 773 K (500°C) or lower	A
(2) Photo-voltaic cells, the following–			
	(a)	(a) types with a power output of 14 mW or more per sq cm under 100 mW per sq cm tungsten 2,800 K (2,527°C) illumination	A
	(b)	(b) gallium arsenide type cells, except those having a power output of less than 4 mW per sq cm under 100 mW per sq cm tungsten 2,800 K (2,527°C) illumination	A
	(c)	(c) types with a power output of 450 mW or more per sq cm under 10 W per sq cm silicon carbide at 1,750 K (1,477°C) illumination	A
	(d)	(d) electro-magnetic (including laser) and ionised particle radiation resistant types	A

(3) Power sources based on radioactive materials systems, other than nuclear reactors A

except

(a) (a) those having an output power of less than 0.5 W and a total weight (force) of more than 890 N (90.7 kg);

(b) (b) those having an output of 0.5 W or more and an overall efficiency of 6% or less, save in respect of technological documents relating thereto;

(c) (c) those specially designed and developed for medical use within the human body.

(4) Specially designed components for the equipment specified in heads (1) and (2) above ... ... A

In this entry–

"energy density" is the product of the average power in watts and the duration of the discharge in hours to 80% of the open circuit voltage divided by the total mass of the cell or battery in kilograms;

"overall efficiency" is the value obtained by dividing the electrical output in watts by the thermal input in watts. This efficiency is to be measured at the beginning of life of the equipment; and

the limit of 523 K relates to the fuel cells alone and not to the fuel conditioning equipment whether it is integrated with or ancillary to such cells.

IL1206	Electric arc devices and equipment, the following–		
	(1) Electric arc devices generating a flow of ionised gas in which the arc column is constricted	A	
except			
	(a) (a) devices of less than 235 kW arc power for cutting or;		
	(b) (b) devices of less than 100 kW arc power for welding, melting, plating or spraying.		
	(2) Equipment incorporating electric arc devices with a constricted arc column and capable of movement in programmable incremental steps of less than 0.01 mm.	A	
	(3) Components, accessories, and control or test equipment specially designed for the devices specified in head (1) above, and specially designed software for the use of such devices, equipment, components, accessories or control or test equipment	A	
except plasma torches for industrial gas heating having a non-constricted arc column with an operating pressure of 1 to 15 bar inclusive.			

GROUP 3D

General Industrial Equipment

IL1301	Equipment specially designed for the production of nickel-, cobalt-or iron-base alloys in crude or semi-fabricated forms having strengths superior to the AISI 300 series (as at May 1982) at temperatures higher than +922 K (+649°C)	A	

	under severe environmental conditions	
except		
	(1) Electric arc and induction furnaces (other than vacuum induction furnaces used in the production of powders of the aforesaid alloys), basic oxygen furnaces and re-melting equipment using other techniques for the production of carbon steels, low alloy steels and stainless steels;	
	(2) Degassing equipment used for the production of carbon steels, low alloy steels and stainless steels;	
	(3) Extrusion presses, hot and cold rolling mills and swaging and forging machines;	
	(4) Decarburizing, annealing and pickling equipment;	
	(5) Surface-finishing equipment; and	
	(6) Slitting and cutting equipment.	
(Note as to electric vacuum furnaces, Group 3C above and as to extrusion presses and hot and cold rolling mills, subsequent entries in this Group.)		
IL1305	Metal rolling mills, the following–	
	(1) Isothermal rolling mills, except those capable of operating only at ambient temperatures	A
	(2) Other mills specially designed or redesigned for the rolling of metals and alloys with a melting point exceeding 1,900°C	A
	(3) Specially designed components, accessories and controls for the mills specified	A

	in heads (1) and (2) above, and specially designed software therefor	
(Note exception (3) in the entry in this Group relating to equipment specially designed for the production of certain nickel-, cobalt-or iron-base alloys.)		
IL1312	Presses the following–	
	(1) Isostatic presses having either of the following characteristics–	
	(a) (a) capable of achieving a maximum working pressure of 138 MPa (20,000 p.s.i.) or greater and possessing a chamber cavity with an inside diameter in excess of 406 mm (16 inches); or	A
	(b) (b) having a controlled thermal environment within the closed cavity and possessing a working cavity with an inside diameter of 127 mm (5 inches) or more	A
	(2) Specially designed dies and moulds (except those used in isostatic presses operating at ambient temperatures), components, accessories and control equipment for the presses specified in head (1) (a) and (b) above, and specially designed software for the use of such presses and their control equipment and components	A
In this entry isostatic presses are presses capable of pressurising a closed cavity through various media (gas, liquid, solid particles etc) to create equal pressure in all		

directions within the cavity upon a workpiece or material. (Note exception (3) in the entry in this Group relating to equipment specially designed for the production of certain nickel-, cobalt-or iron-base alloys.)		
IL1352	Nozzles, dies and extruder barrels specially designed for the processing of any of the materials specified in sub-head (2)(b) of the entry in Group 3I relating to fluorocarbon compounds	A
IL1353	Machinery and apparatus specially designed for the manufacture of cable and optical fibres specified in the entry in Group 3F relating to cable and wire	A
IL1354	Equipment designed for the manufacture or testing of printed circuit boards, the following–	
	(1) Equipment specially designed for removal of resists or printed circuit board materials by dry (e.g. plasma) methods	A
	(2) Computer-aided design (CAD) equipment for printed circuit boards, having any of the following functions–	
	(a) (a) generation of artwork design with an interactive capability	A
	(b) (b) generation of test string lists for multi-layer boards	A
	(c) (c) generation of data or programmes for stored-programme controlled printed circuit board drilling equipment	A

	(d) (d) generation of data or programmes for stored-programme controlled printed circuit board shaping and profiling equipment	A
	(e) (e) generation of data for control of the sequencing of processess of the equipment for printed circuit board manufacture covered by head (3) of this entry	A
	(3) High-speed automated continuous panel processors for plating capable of delivering 860 A/mu22 (80A/ftu22) or more of plate current	A
	except processors specially designed for plating tab (edge) connectors.	
	(4) Stored-programme controlled inspection equipment for the detection of defects in printed circuit boards using optical pattern comparison or other machine scanning techniques	A
	(5) Stored-programme controlled electrical test equipment for the identification of open and short circuits on bare printed circuit boards, capable of–	
	(a) (a) continuity testing (4 ohm or less) at a rate of 2,500 or more measurements per second	A
or		
	(b) (b) high voltage testing (50 volts or more) at a rate of 10,000 or	A

more measurements per minute	
(6) Stored-programme controlled multispindle drills and routers having any of the following characteristics–	
(a) (a) absolute positioning accuracy of .26610 micrometers (0.0004 inch) or better	A
(b) (b) minimum time needed for drill bit changes of 5 seconds or less	A
(c) (c) X and Y positioning speeds of 0.125 metres per second (300 inches per minute) or higher for drilling or for routing	A
(7) Stored-programme controlled cyclic voltametric stripping equipment specially designed for printed circuit board plating bath monitoring and analysis	A
(8) Specially designed components and accessories and specially designed software for the equipment specified in heads (1) to (7) above (inclusive)	A
except equipment with controls using any of the following–	
(a) (a) cams and other purely mechanical means;	
(b) (b) switches, including thumbwheel switches;	
(c) (c) plugboards;	
(d) (d) on-off and analogue controllers;	

	(e) (e) diode matrices; or	
	(f) (f) punched paper tape controllers without a capability to compute, manipulate, or store and re-run programme data.	
	In this entry the term "stored-programme-controlled" refers to a control using instructions stored electronically which a processor can execute in order to direct the performance of predetermined functions.	
	(Note head (2) of the entry in Group 3F relating to lasers and laser systems.)	
IL1355	Equipment for the manufacture or testing of electronic components and materials, the following–	
	(1) Equipment specially designed for the manufacture or testing of electron tubes specified in the entries in Group 3F relating to electronic cathode-ray tubes, cold cathode tubes, triggered spark gaps, thyratrons, electron tubes or valves, and of optical elements specified in the entry in Group 3F relating thereto	A
	(2) Equipment specially designed for the manufacture or testing of semiconductor devices, integrated circuits and assemblies, and systems incorporating or having the characteristics of such equipment, the following–	
	(a) (a) equipment for producing polycrystalline silicon specified in the entry in	A

	Group 3I relating to compounds and materials, having a purity of 99.99% or greater in the form of rods (ingots, boules), pellets, sheets, tubes or small particles	
(b)	(b) equipment specially designed for purifying or processing III-V or II-VI semiconductor materials specified in the entry in Group 3I relating to compounds and materials	A
(c)	(c) crystal pullers, furnaces and gas systems, the following–	
(i)	types with specially designed stored-programme-controlled temperature, power input or gas, liquid or vapour flow	A
(ii)	diffusion, oxidation and annealing furnaces for operation at pressures above 1 atmosphere (nominal)	A
(iii)	annealing or re-crystallizing equipment other than constant temperature furnaces employing high rates of energy transfer capable of processing wafers at a rate greater than 50 square centimetres per minute	A
(iv)	plasma-enhanced or photo-enhanced chemical reactor equipment	A
(v)	equipment for automatic control of crystal taper and diameter	A

except taper and diameter control mechanisms using any of the following techniques–

(a) radiation pyrometers;

(b) thermocouples;

(c) RF power sensors; or

(d) mass weighing, without digital or anomaly control permitting the growth of semi-conductors. A

(vi) crystal pullers having any of the following characteristics– ... ...

(a) rechargeable without replacing the crucible containers;

(b) capable of operation at pressures above or below 10u25 pascals (1 atomosphere absolute);

(c) capable of pulling crystals of a diameter greater than 76.2 mm;

(d) specially designed to minimise convection currents in the melt by the use of magnetic fields or multiple crucibles; or

(e) capable of pulling sheet or ribbon crystals.

(vii) vacuum induction-heated zone-refining equipment for operation at a pressure of 0.01 pascal or less A

(d) (d) equipment for epitaxial growth having any of the following characteristics– A

(i) operation at pressures below 10u25 pascals (1 atmosphere absolute);

(ii) stored-programme-controlled;

(iii) rotating vertical-support radiant-heated reactors;

(iv) specially designed for processing bubble memories;

(v) metal-organic chemical vapour deposition reactors; or

(vi) for liquid phase epitaxy.

(e)	(e) molecular beam epitaxial growth equipment	A
(f)	(f) magnetically enhanced sputtering equipment	A
(g)	(g) equipment designed for ion implantation or ion-enhanced or photo-enhanced diffusion	A
(h)	(h) equipment for selective or non-selective removal by dry methods of passivation layers, dielectrics, semiconductor materials, resists or metals	A

except horizontal, cylindrical, plasma etchers without stored-programme-control end-point detection, automatic loading or rotating mechanisms and not having the capability for parallel plate etching as used in semiconductor device manufacture or vacuum sputtering equipment designed to operate in the sputter-etch mode

(i)	(i) equipment for semiconductor device fabrication operating below 10u25 pascals (1 atmosphere absolute) for the chemical vapour deposition of oxides, nitrides, metals, and polysilicon, except reactive-sputtering equipment	A
(j)	(j) electron beam systems (including scanning electron microscopes) capable of mask making or semiconductor device processing and having any of the following characteristics–	A

(i) electrostatic beam deflection;

(ii) shaped, non-Gaussian beam profile;

(iii) beam blanking capability;

(iv) digital-to-analogue conversion accuracy greater than 12 bit;

(v) digital-to-analogue conversion rate greater than 3 MHz; or

(vi) target-to-beam position feed-back control precision of 1 micrometre or finer;

except

(a) electron beam deposition systems; and

(b) scanning electron microscopes having beam blanking capability which are equipped for Auger analysis.

(k)	(k) surface-finishing equipment, specially designed for the processing of semiconductor wafers and having any of the following characteristics–	A

(i) waxless or non-adhesive mounting;

(ii) double-sided simultaneous polishing or lapping;

(iii) capable of polishing and lapping wafers greater than 76.2 mm in diameter; or

(iv) lapping or polishing in two stages on the same machine.

(l)	(l) interconnection equipment which may include common single or multiple vacuum chambers specially designed to permit the integration of equipment specified in this entry into a complete system	A

(3) Masks, mask substrates, Mask-making equipment and image transfer equipment for the manufacture of the devices and components specified in head (2) above, the following–

(a)	(a) finished masks, reticles and designs therefor	A
(b)	(b) hard surface (e.g. chromium, silicon, iron oxide) coated substrates (e.g. glass, quartz, sapphire) for the	A

preparation of masks having dimensions greater than 76.2 mm by 76.2 mm ... ...

(c) (c) computer-aided design (CAD) equipment for transforming schematic or logic diagrams into designs for producing semiconductor devices or intergrated circuits, having any of the following functions– ... ... A

(i) storage of pattern cells for sub-division of integrated circuits;

(ii) scaling, positioning or rotation of pattern cells;

(iii) interactive graphic capabilities;

(iv) design rule and circuit checking; or

(v) circuit layout modification of the arrangement of the elements

(d) (d) mask fabrication machines using photo-optical methods, the following–

(i) step and repeat cameras capable of producing arrays larger than 63.5 mm by 63.5 mm, or capable of producing a single exposure larger than 3.75 mm by 3.75 mm in the focal plane, or capable of producing useful line widths of 3.5 micrometres or less ... ... A

(ii) pattern generators specially designed for the generation or A

	manufacture of masks or the creation of patterns in photosensitive layers and with placement precision finer than 10 micrometres	
(iii)	mask fabrication equipment containing automatic adjustment of focus or adjustment of the mask material into the focal plane	A
(iv)	equipment and holders for altering masks or reticles to remove defects	A
	(e) (e) mask, reticle or pellicle inspection equipment, the following–	
(i)	for comparison with a precision of 0.75 micrometre or finer over an area of 63.5 mm by 63.5 mm or greater	A
(ii)	stored-programme-controlled equipment with a resolution of 0.25 micrometre or finer and with a precision of 0.75 micrometre or finer over a distance in one or two co-ordinates of 63.5 mm or greater	A
(iii)	stored-programme-controlled defect inspection equipment, except conventional scanning electron microscopes not specially designed or instrumented for automatic pattern inspection	A
	(f) (f) align and expose equipment using photo-optical methods, including projection image transfer equipment, capable of	A

performing any of the following functions–

(i) Production of a useful pattern size of less than 5 micrometres;

(ii) alignment with a precision finer than 1 micrometre;

(iii) field coverage greater than 76.2 mm by 76.2 mm;

(iv) wafer backside alignment;

(v) automatic alignment by the sensing of patterns or index marks on the substrate; or

(vi) projection image transfer for the processing of slices (wafers) of 50.8 mm or greater in diameter (in the case of equipment except non contacting (proximity) image transfer equipment).

(g)	(g) electron beam, ion beam, or X-ray equipment for projection image transfer	A
(h)	(h) photo-optical or non-photo-optical step and repeat or partial field equipment for the transfer of the image on to the wafer	A
(i)	(i) mask contact image transfer equipment for imaging a field greater than 76.2 mm by 76.2 mm	A

(4) Stored-programme-controlled inspection equipment for the detection of defects in processed wafers,	A

substrates or chips using optical pattern comparison or other machine scanning techniques, except conventional scanning electron microscopes not specially designed or instrumented for automatic pattern inspection ... ...

(5) Specially designed stored-programme-controlled measuring and analysis equipment, the following–

(a)	(a) specially designed for the measurement of oxygen or carbon content in semi-conductor materials	A
(b)	(b) equipment for concurrent etching and doping profile analysis (employing capacitance-voltage or current-voltage analysis techniques)	A
(c)	(c) equipment for line-width measurement with a resolution of 1.0 micrometre or finer	A
(d)	(d) specially designed flatness measurement instruments capable of measuring deviations from flatness of 10 micrometres or less with a resolution of 1.0 micrometre or finer	A

(6) Equipment for the assembly of integrated circuits specified in head (2) above, the following–

(a)	(a) stored-programme-controlled die (chip) mounters and	A

	bonders with a positioning accuracy finer than 50 micrometres or incremental steps finer than 6.4 micrometres	
(b)	(b) stored-programme-controlled wire bonders and welders for performing consecutive bondror performing consecutive bonding operations	A
(c)	(c) equipment for producing multiple bonds in a single operation, including but not limited to beam lead bonders, chip carrier bonders and tape bonders	A
(d)	(d) semi-automatic or automatic hot cap sealers, in which the cap is heated locally to a higher temperature than the body of the package, specially designed for ceramic microcircuit packages specified in the entry in Group 3F relating to electronic component assemblies and which have a throughput equal to or greater than one package per minute or thermal compression bonders (also known as nail head bonders)	A

except, general purpose resistance type spot welders

(7) Stored-programme-controlled wafer probing	A

equipment having any of the following characteristics– ... ...

(a) (a) positioning accuracy finer than 50 micrometres, or incremental steps finer than 6.4 micrometres;

(b) (b) individual die location read-out (X–Y position information) during testing;

(c) (c) capability of testing devices having more than a total of 24 terminals; or

(d) (d) automatic slice (wafer) alignment.

(8) Test equipment, except test equipment which is not of a general purpose nature and which is specially designed for, and dedicated to, testing assemblies or a class of assemblies for home and entertainment applications or testing electronic components, assemblies, sub-assemblies and microcircuits not specified in the entry in Group 3F relating to electronic component asemblies provided they do not incorporate computing facilities with user-accessible programming capabilities, the following–

(a) (a) stored-programme-controlled equipment specially designed for testing discrete semiconductor devices and unencapsulated dice, capable of performing any of the following functions– A

(i) measurement of time intervals of less than 10 nanoseconds;

(ii) measurement of parameters (such as fd2T, S parameters, noise figure) at frequencies greater than 250 MHz;

(iii) resolution of currents of less than 100 picoamperes;

(iv) measurement of spectral response at wavelengths outside the range from 450 to 950 nanometres.

(b) (b) stored-programme-controlled equipment specially designed for testing integrated circuits and assemblies thereof, capable of performing any of the following functions– A

(i) functional (truth table) testing at a pattern rate greater than 2 MHz;

(ii) resolution of currents of less than 1 nanoampere;

(iii) testing of integrated circuits (not mounted on circuit boards) in packages having more than a total of 24 terminals, except equipment specially designed for and dedicated to the testing of integrated circuits other than those specified in the entry in Group 3F relating to electronic components; or

(iv) measurements of rise times, fall times and edge placement times with a resolution of less than 20 nanoseconds.

(c) (c) equipment specially designed for determining the performance of focal-plane arrays at wavelengths greater than 1,200 nanometres, using stored-programme-controlled measurements or computer-aided evaluation and having any of the following characteristics– ... ... A

(i) using scanning light spot diameters of less than 0.12 mm;

(ii) designed for measuring photosensitive performance parameters and for evaluating frequency response, modulation transfer function, uniformity of responsitivity or noise;

(iii) designed for eavaluating arrays capable of creating images of greater than 32 × 32 line elements.

(d) (d) specially designed for bubble memories ... ... A

(9) Class 10 filters capable of providing an environment of 10 or fewer particles of 0.3 micrometre or more per cubic foot and filter materials therefor A

(10) Pellicles made of polycrystalline silicon as defined in the entry on Group 3I relating thereto ... ... A

(11) Specially designed components, accessories and software for the equipment specified in heads (1) to (10) A

above (inclusive) except quartz crucibles specially designed for equipment specified in head (2) above ... ...

(12) Software for the design of semiconductor devices or microcircuits which–

(a)	(a) performs any of the functions in sub-head 3(c) above	A
(b)	(b) can be used for transient analysis	A
(c)	(c) can be used for logic analysis or logic checking	A
(d)	(d) can be used for automatic routing or cell placement	A
(e)	(e) can be used for the generation of test vectors	A
(f)	(f) can be used for process simulation	A

In this entry–

"assembly" means a number of components (ie circuit elements, discrete components, microcircuits) connected together to perform a specific function or functions, replaceable as an entity (and normally capable of being disassembled);

"discrete semiconductor devices" include diodes, transistors, thyristors, photocells and solar cells;

"integrated" means a device in which a number of passive and active circuit elements are considered as indivisibly associated on or within a continuous structure to

	perform the function of a circuit;	
	"magnetically enhanced" refers to equipment incorporating a cathode assembly having an integral structure for enhancing plasma intensity;	
	"masks" includes those used in electron beam lithography, X-ray lithography, and for ultraviolet lithography as well as the usual ultraviolet and visible photo-lithography; and	
	"stored-programme-controlled" refers to a control using instructions stored electronically which a processor can execute in order to direct the performance of predetermined functions.	
IL1356	Equipment specially designed or incorporating modifications for the continuous coating of polyester base magnetic tape used as a recording medium specified in sub-head (4) of the entry in Group 3G relating to recording and reproducing equipment, and specially designed components therefor	A
	except general purpose continuous coating equipment.	
IL1357	Equipment for the production of fibres specified in the entries in Group 3I relating to fibrous and filamentary materials or their composites, the following–	
	(1) Filament winding machines of which the motions for positioning, wrapping and winding fibres are co-ordinated and programmed in three	A

or more axes, specially designed to fabricate composite structures or laminates from fibrous and filamentary materials; and co-ordinating and programming controls therefor ... ...

(2) Tape-laying machines of which the motions for positioning and laying tape and sheets are co-ordinated and programmed in two or more axes, specially designed for the manufacture of composite airframes and missile structures ... ... A

(3) Interlacing machines, including adapters and modification kits, for weaving, interlacing or braiding fibres or fabricate composite structures, except textile machinery which has not been modified for the above end-uses ... ... A

(4) Specially designed or adapted equipment for the production of fibrous and filamentary materials specified in heads (1) and (2) of the entry in Group 3I relating to fibrous and filamentary materials, the following–

(a) (a) equipment for converting polymeric fibres (such as polyacrylonitrile, rayon, or polycarbosilane) including special provision to strain the fibre during heating A

(b) (b) equipment for the vapour deposition of elements or compounds on heated filamentary substrates ... ... A

(c) (c) equipment for the wet-spinning of refractory ceramics A

	(such as aluminium oxide)	
	(5) Specially designed or adapted equipment for special fibre surface treatment or for producing prepregs and preforms specified in head (3) of the entry in Group 3I relating to fibrous and filamentary materials	A
Equipment covered by this head includes, but is not limited to, rollers, tension stretchers, coating equipment, cutting equipment and clicker dies.		
	(6) Specially designed components and accessories and specially designed software, for equipment specified in heads (1) to (5) above (inclusive)	A
Specially designed or adapted components and accessories for the machines covered by this entry include, but are not limited to, moulds, mandrels, dies, fixtures and tooling for the preform pressing, curing, casting, sintering or bonding of composite structures, laminates and manufactures thereof covered by the entry therefor in Group 3I.		
IL1358	Equipment specially designed for the manufacture or testing of devices and assemblies included in heads (2) to (5) (inclusive) of the entry in Group 3G relating to materials composed of crystals having spinel, hexagonal, orthorhombic or garnet crystal structures, and thin film devices and for the manufacture or testing of magnetic recording media, other than tape, specified in head (4) of the entry in Group	

3G relating to recording or reproducing equipment, the following–

(1) Equipment for the manufacture of single and multi-aperture forms specified in heads (2) to (4) (inclusive) of the entry in Group 3G relating to materials composed of crystals, and single aperture forms of ferrites having a maximum dimension less than 0.76 mm, the following–

(a)	(a) automatic presses for the production of the specified forms	A
(b)	(b) press dies for the production of the specified forms	A
(c)	(c) automatic equipment for the monitoring, grading, sorting, exercising or testing of the specified forms	A

(2) Equipment for the manufacture of thin film devices and associated equipment, the following–

(a)	(a) equipment for the manufacture of thin film memory storage or switching devices having square hysteresis loops	A
(b)	(b) automatic equipment for the monitoring, grading, sorting, exercising or testing of thin film (including plated wire and plated rods) memory storage or switching devices	A

(3) Automatic equipment for monitoring, exercising or testing assemblies of any A

	devices specified in heads (2) to (4) (inclusive) of the entry in Group 3G relating to materials composed of crystals	
	(4) Equipment which incorporates specially designed modifications for the application of magnetic coating to flexible disk recording media with a packing density exceeding 2460 bit per cm (6250 bit per inch)	A
except general purpose coating equipment.		
	(5) Equipment specially designed for the application of magnetic coating to non-flexible (rigid) disk type recording media specified in head (4) of the entry in Group 3G relating to recording or reproducing equipment	A
	(6) Stored-programme-controlled equipment for monitoring, grading, exercising or testing recording media other than tape specified in head (4) of the entry in Group 3G relating to recording or reproducing equipment	A
	(7) Specially designed components and software for the equipment specified in heads (1) to (5) (inclusive)	A
IL1359	Specially designed tooling and fixtures for the manufacture of fibre-optic connectors and couplers specified in head 2(f) of the entry in Group 3F relating to cable and wire	A
IL1360	Stored-programme-controlled equipment capable of automatic X-ray orientation and angle correction of double-rotated stress-compensated quartz crystals and specified in the entry in Group 3G relating to quartz crystals having piezo-electric qualities, with a	A

	tolerance of 10 seconds of arc maintained simultaneously in both angles of rotation	
IL1361	Test facilities and equipment for the design or development of aircraft or gas turbine aero-engines, the following–	
	(1) Supersonic (Mach 1.4 to Mach 5), hypersonic (Mach 5 to Mach 15) and hypervelocity (above Mach 15) wind tunnels, except those specially designed for educational purposes and having a test section size (measured internally) of less than 25 cm	A
	(2) Devices for simulating flow-environments of Mach 5 and above, including but not limited to hot shot tunnels, plasma arc tunnels, shock tubes, shock tunnels, gas tunnels and light gas guns	A
	(3) Wind tunnels and devices, other than two-dimensional sections, having unique capabilities for simulating Reynolds number flow in excess of 25 × 10u26 at transonic velocities	A
	(4) Automated control systems, instrumentation (including sensors) and automated data-acquisition equipment, specially designed for use with wind tunnels and devices specified in heads (1) to (3) above (inclusive)	A
	(5) Models, specially designed for use with wind tunnels, of aircraft, helicopters, airfoils, spacecraft, space launch vehicles or rockets specified in the entries in Groups 1 and 3E relating thereto or of surface-effect vehicles specified in head (2) of the entry in Group 3E relating to ships	A

(6) Specially designed electromagnetic interference and electromagnetic pulse simulators	A
(7) Specially designed test facilities and equipment for the development of gas turbine aero-engines and components, the following–	
(a) (a) special test facilities capable of applying dynamic flight loads, measuring performance or simulating the design operating environments for rotating assemblies or aero-engines	A
(b) (b) test facilities, test rigs and simulators for measuring combustion system and hot gas flow path performance, heat transfer and durability for static assemblies and aero-engine components	A
(c) (c) specially designed test rigs, equipment or modified gas turbine engines which are used for development of gas turbine aero-engine internal flow systems (gas path seals, air-oil seals and disc cavity flow fields)	A
(8) Specially designed components, accessories and software for the facilities and equipment specified in heads (1) to (7) above (inclusive)	A

IL1362 Vibration test equipment and ancillary equipment therefor, the following–

(1) Vibration test equipment using digital-control techniques and specially designed ancillary equipment and software therefor ... ... A

except

(a) (a) mechanical and pneumatic exciters (thrusters);

(b) (b) other individual exciters (thrusters) with a maximum thrust of less than 100 kN;

(c) (c) vibrometers;

(d) (d) analogue equipment; and

(e) (e) other ancillary equipment unless falling within a description in an entry in Groups 3F or 3G.

(2) High intensity acoustic test equipment having either of the following characteristics–

(a) (a) capable of producing an overall sound pressure level of 140 dB or greater (referenced to 2 × 10u2–u25 Nmu22 A

or

(b) (b) having a rated output of 4 kW or greater ... ... A

and specially designed ancillary equipment and software therefor ... ... A

except

(i) analogue equipment; and

	(ii) other ancillary equipment unless falling within a description in an entry in Groups 3F or 3G.	
	(3) Ground vibration (including modal survey) test equipment which uses digital-control techniques, and specially designed ancillary equipment and software therefor	A
	except	
	(a) (a) analogue equipment; and	
	(b) (b) other ancillary equipment unless falling within a description in an entry in Groups 3F or 3G.	
IL1363	Specially designed water tunnel equipment, components, accessories and data bases for the design and development of vessels, the following–	
	(1) Automated control systems, instrumentation (including sensors) and data acquisition equipment specially designed for water tunnels	A
	(2) Automated equipment to control air pressure acting on the surface of the water in the test section during the operation of the water tunnel	A
	(3) Components and accessories for water tunnels, the following–	
	(a) (a) balance and support systems	A
	(b) (b) automated flow or noise measuring devices	A
	(c) (c) models of hydrofoil vessels, surface-effect vehicles and specially	A

	designed equipment and components specified in heads (1), (2), (4) of the entry in Group 3E relating to ships, for use in water tunnels	
	(4) Data bases generated by use of equipment specified in heads (1) to (3) above (inclusive)	A
	(5) Specially designed software for the equipment, components, accessories and data bases specified in this entry	A
IL1364	Machinery and equipment for the manufacture of hydrofoil vessel and surface-effect vehicle structures and components, the following–	
	(1) Specially designed equipment for manufacturing anisotropic, orthotropic or sandwich structures specified in sub-head (12)(c) of the entry in Group 3E relating to ships	A
	(2) Specially designed equipment for the production and testing of flexible materials for skirts, seals, air curtains, bags and fingers for surface-effect vehicles	A
	(3) Specially designed equipment for the production of water-screw propellers specified in head (13) of the entry in Group 3E relating to ships	A
	(4) Specially designed equipment for the production, dynamic balancing and automated testing and inspection of lift fans for surface-effect vehicles	A
	(5) Specially designed equipment for the production of water-jet propulsion pumps rated at 3,000 hp or more, or	A

	multi-pump system equivalents thereof	
	(6) Specially designed equipment for the production, dynamic balancing and automatic testing of sectored disc and concentric-drum rotors for DC homopolar machines	A
	(7) Specially designed components and accessories for the equipment specified in heads (1) to (6) above (inclusive)	A
IL1365	Equipment specially designed for in-service monitoring of acoustic emissions in airborne vehicles, or in under-water vehicles specified in the entry in Group 3E relating to deep submergence vehicles, capable of discriminating acoustic emissions related to crack growth from innocuous noise sources and capable of spatial location of the crack, and specially designed components, accessories and software therefor	A
IL1370	Machine tools for generating optical quality surfaces and specially designed components, accessories and software therefor, the following–	
	(1) Turning machines using a single point cutting tool and having all of the following characteristics	A
	(a) (a) slide positioning accuracy finer than 0.0005 mm per 300 mm of travel, TIR (peak-to-peak);	
	(b) (b) slide positioning repeatability finer than 0.00025 mm per 300 mm of travel, TIR (peak-to-peak);	

(c) (c) spindle runout (radial and axial) less than 0.0004 mm TIR (peak-to-peak);

(d) (d) angular deviation of the slide movement (yaw, pitch and roll) less than 2 seconds of arc (peak-to-peak) over full travel; and

(e) (e) slide perpendicularity less than 0.001 mm per 300 mm of travel, TIR (peak-to-peak).

In this entry evaluation of performance shall be made under conditions yielding the most accurate values, including but not limited to the incorporation of control systems which permit mechanical, electronic or software compensation.

(2) Fly cutting machines having both of the following characteristics ... ... A

(a) (a) spindle run-out (radial and axial) less than 0.0004 mm TIR (peak-to-peak);

(b) (b) angular deviation of slide movement (yaw, pitch and roll) less than 2 seconds of arc (peak-to-peak) over full travel.

(3) Specially designed components, the following–

(a) (a) spindle assemblies, consisting of spindles and bearings as a minimum assembly, except those A assemblies with axial and radial axis motion measured along the spindle axis in one revolution of the spindle equal to or greater than 0.0008 mm TIR (peak-to-peak) ... ...

(b) (b) linear induction motors used as drives for slides having all of the following characteristics– ... ... A

(i) stroke greater than 200 mm;

(ii) nominal force rating greater than 45 N; and

(iii) minimum controlled incremental movement less than 0.001 mm.

(4) Specially designed accessories, the following–

single point diamond cutting tool inserts having all of the following characteristics– ... ... A

(a) (a) flawless and chip-free cutting edge when magnified 400 times in any direction;

(b) (b) cutting radius between 0.1 mm and 5 mm; and

(c) (c) cutting radius out-of-roundness less than 0.002 mm TIR (peak-to-peak).

IL1371 Anti-friction bearings and components therefor, the following–

(1) Ball and roller bearings having an inner bore diameter of 10 mm or less and having tolerances specified in Table 2

(EP5) of British Standard 292: 1969, or better and either of the following characteristics–

(a) (a) made of any material ... ... A

except

(i) low carbon steel containing not more than 0.4% of carbon and no other elements other than those present as impurities or in such low quantities as not to modify the basic characteristics of the steel;

(ii) high carbon chromium steel types Steel-534A99 and 535A99 as specified in British Standard 970: Part 2: 1970, or equivalent types normally used in the manufacture of ball or roller bearings;

(iii) nickel-molybdenum steel type Steel-665M17 as specified in British Standard 970: Part 3: 1971, or equivalent types normally used in the manufacture of ball or roller bearings; and

(iv) stainless steel type AISI-440C (SAE-51440C) or equivalent types normally used in the manufacutre of ball or roller bearings; or

(b) (b) processed by heat treatment for the purpose of stabilising such bearings for use at normal temperatures over 150°C ... ... A

(2) Ball and roller bearings (except separable ball bearings A

	and thrust ball bearings) having an inner bore diameter exceeding 10 mm and having tolerances specified in Table 3 (EP7) of British Standard 292: 1969, or better, and either of the characteristics in sub-heads (1)(a) or (1)(b) of this entry	
	(3) Ball and roller bearings having tolerances better than those specified in Table 3 (EP7) of British Standard 292: 1969	A
	(4) Gas-lubricated foil bearings	A
	(5) Components of ball and roller bearings, usable only for bearings specified in heads (1) to (3) above (inclusive), the following:	
	outer rings, inner rings, retainers, balls, rollers and sub-assemblies	A
	This entry also covers bearings having tolerances specified in imperial measures which are equivalent to the metric tolerances specified in British Standard 292: 1969.	
	This entry does not cover hollow bearings.	
IL1385	Specially designed production equipment for compasses, gyroscopes (gyros), acclerometers and inertial equipment specified in the entry in Group 3E relating to compasses, gyroscopes (gyros), accelerometers and inertial equipment	A
IL1391	Robots, robot controllers and robot end-effectors, the following–	
	(1) Robots having any of the following characteristics:	
	(a) (a) capable of employing feedback	A

information on-line (real-time) from one or more sensors to generate programmes or modify programmed instructions on numerical programme data ... ...

except those using information derived only from sensors used to measure–

(i) the velocity, position (other than inertial position measuring systems), drive motor current, voltage, fluid or gas pressure or temperature of the robot;

(ii) through-the-arc current (or voltage) for weld seam tracking; or

(iii) binary or scalar values for–

(a) position, via photo-electric, inductive or capacitive proximity sensors;

(b) tool drive motor voltage or current or hydraulic/pneumatic pressure for determination of force or torque; and

(c) external safety functions.

(b) (b) specially designed to comply with national safety standards applicable to explosive munitions environments ... ... A

(c) (c) incorporating means of protecting hydraulic lines against externally induced punctures A

	caused by ballistic fragments and designed to use hydraulic fluids with flash points higher than 839 K (566°C)	
(d)	(d) specially designed for under water use	A
(e)	(e) operable at altitudes exceeding 30,000 metres	A
(f)	(f) specially designed for outdoor applications and meeting military specifications therefor	A
(g)	(g) specially designed or rated for operating in an electromagnetic pulse (EMP) environment	A
(h)	(h) specially designed or rated as radiation-hardened beyond that necessary to withstand normal industrial (other than nuclear industry) ionising radiation	A
(i)	(i) equipped with robot manipulator arms which contain titanium-based alloys specified in the entry in Group 3H relating thereto or fibrous and filamentary materials specified in the entry in Group 3I relating thereto	A
(j)	(j) equipped with precision measuring devices specified in the entry in Group 3F relating to precision	A

	linear and angular measuring systems	
(k)	(k) specially designed to move autonomously its entire structure through three-dimensional space in a simultaneously coordinated manner except systems in which the robot moves on a fixed track	A

(2) Electronic controllers having any of the following characteristics:

(a)	(a) controllers specially designed to be part of a robot specified in sub-heads (b) to (h) inclusive, (j) or (k) of head (l) above	A
(b)	(b) minimum programmable increment less (finer) than 0.001 mm per linear axis	A
(c)	(c) having more than one integral interface which meets or exceeds ANSI/IEEE standard 488-1978, IEC publication 625-1 or any equivalent standard for parallel data exchange	A
(d)	(d) capable of being programmed by means other than lead-through, key-in or teach-pendant techniques	A
(e)	(e) word size exceeds 16 bit	A

	(excluding parity bits)	
(f)	(f) incorporating interpolation algorithms for an order of interpolation higher than linear or circular	A
(g)	(g) permitting on-line (real-time) generation or modification of the programmed path, velocity and functions other than the following–	A

(i) manual velocity override;

(ii) fixed linear or rotary axis offset;

(iii) manual robot path editing (including manual path compensation) excluding source language used to programme automatically the robot path, velocity or function;

(iv) branching to pre-programmed modification of the robot path, velocity or function;

(v) fixed cycles;

(vi) key-in or teach-in modifications.

(3) End-effectors having any of the following characteristics:

(a)	(a) equipped with one or more sensors, except sensors used to measure the parameters or values specified in sub-heads (a)(i), (ii) or (iii) of head (1) above;	A

	(b)	(b) having integrated computer-aided data processing	A
except those using sensors used to measure the parameters or values specified in sub-heads (a) (i), (ii) or (iii) of head (1) above;			
	(c)	(c) equipped with an integral interface which meets or exceeds ANSI/IEEE Standard 488-1978, IEC publication 625-1 or any equivalent standard for parallel data exchange	A
	(d)	(d) having any of the characteristics specified in sub-heads (b) to (h) inclusive or (j) of head (l) above	A
	(4) Specially designed components and specially designed software for the equipment specified in heads (1) to (3) above (inclusive)		A

In this entry–

“robot” means a manipulation mechanism which is reprogrammable, multifunctional and capable of positioning or orientating material, parts, tools or special devices through variable movements in three-dimensional space. It incorporates two or more closed or open loop servo-devices (including stepping motors) and is reprogrammed by means of the teach/playback method, an electronic computer or a programmable logic controller;

	"end-effectors" include grippers, active tool units (being devices for applying motive power, process energy or sensing to the workpiece) and any other tooling that is attached to the baseplate on the end of the robot's manipulator arms; and "sensor" means a detector of a physical phenomenon, the output of which (after conversion into a signal that can be interpreted by a controller) is able to generate programmes or modified programmed instructions or numerical programme data, and includes sensors with machine vision, infrared imaging, acoustical imaging, tactile feel, inertial position measuring, optical or acoustic ranging or force or torque measuring capabilities.	
IL1399	Software for automatically controlled industrial systems to produce assemblies or discrete parts (except software in machine executable form for industrial sectors other than nuclear, aerospace, shipbuilding, heavy vehicles, machine building, microelectronics and electronics), possessing all of the following characteristics– (1) Specially designed for automatically controlled industrial systems which include at least eight pieces of any combination of items of the following equipment– (a) (a) a machine tool or dimensional inspection machine specified in the entries in Group 3 relating to machine tools and numerical control systems and	A

machine tools for generating optical quality surfaces,

(b) (b) a robot specified in the entry in Group 3D relating thereto;

(c) (c) a digitally-controlled spin-forming or flow-forming machine specified in the entry in Group 3A relating thereto;

(d) (d) digitally-controlled equipment specified in the entries in Group 3A relating to equipment, tools, dies, moulds, fixtures and gauges for the manufacture or inspection of aircraft, aircraft manufactures, aircraft engines, gas turbine blades or vanes and gear making machines;

(e) (e) a digitally-controlled electric arc device specified in the entry in Group 3C relating to plasma arc equipment;

(f) (f) digitally-controlled equipment specified in the entries in Group 3D relating to equipment for the manufacture or testing of printed circuit boards, electronic components and materials;

(g) (g) digitally-controlled equipment specified in the entry in Group 3D relating to equipment for the production of fibrous and filamentary materials;

(h) (h) digitally-controlled equipment specified in the entry in Group 3F relating to electronic measuring, calibrating, counting and testing equipment;

(i) (i) a digitally-controlled measuring system as specified in the entry in Group 3F relating to precision linear and angular measuring systems;

(2) Capable of integrating in a hierarchical manner, while having access to data which may be stored outside the supervisory digital computer, the manufacturing process with (i) design functions or (ii) planning and scheduling functions; and

(3) Automatically generating or verifying the manufacturing data and instructions, including selection of equipment and sequences of manufacturing operations for the manufacturing processes from design and manufacturing data, or automatically reconfiguring the automatically controlled industrial system through reselecting equipment and sequences of manufacturing operation by real-time processing of data pertaining to anticipated but unscheduled events (except software which only provides rescheduling of functionally identical equipment within flexible

	manufacturing units using prestored part programmes and a prestored strategy for the distribution of the part programmes).	
	In this entry–	
	"automatically controlled industrial system" is a combination of one or more flexible manufacturing units and a supervisory digital computer for coordination of the independent sequences of computer instructions to, from and within the flexible manufacturing units;	
	"flexible manufacturing unit" is an entity which consists of a combination of a digital computer including its own main storage and its own related equipment and at least one of the machines specified in head (1) above of this entry.	
	(See also the entry in Group 4 relating to technology for the design of automatically controlled industrial systems.)	

GROUP 3E

Aircraft, Spacecraft, Compasses, Gyroscopic Apparatus, Marine Equipment and Ships (other than Warships and Naval Equipment)

IL1416	Ships, surface-effect vehicles, water-screw propellers, and specially designed components, the following–	
	(1) Hydrofoil vessels with automatically controlled foil systems and capable of a speed of more than 40 knots in rough water (sea state five)	S,I
	(2) Surface-effect vehicles, namely hovercraft, air cushion vehicles of both the sidewall and skirted varieties and all variations of vehicles using	A

the wing-in-ground effect for positive lift	
(3) Small waterplane area twin hull (SWATH) vessels having underwater hulls whose cross-sectional area varies along the longitudinal axis between points two major diameters from the bow and two major diameters from the stern	A
(4) Ships, sea going, including sea going fishing vessels and coasters, designed for speeds of over 26 knots when fully loaded	S,I
(5) Ships with hulls and propulsion machinery made wholly or primarily of non-magnetic materials	S,I
(6) Ships with decks and platforms specially strengthed to receive weapons	S,I,L
(7) Ships fitted with any of the following–	
(a) (a) apparatus and equipment specified in Group 1	S,I
(b) (b) apparatus and equipment specified in the entries in Group 3 relating to–	
(i) marine or terrestrial acoustic or ultrasonic systems for detecting or locating underwater or subterranean objects or features;	S,I
(ii) communication, detection and tracking equipment;	S,I
(iii) navigation, direction finding, radar equipment; or	S,I
(iv) compasses and gyroscopic apparatus; or	
(c) (c) degaussing equipment	S,I

(8) Ships having special structural features for landing personnel and/or vehicles on a beach	I
(9) Ships capable of supporting helicopter operations and maintenance	I
(10) Ships capable of submerging	I
(11) Ships not elsewhere specified in this Part of this Schedule of below 100 tons GRT including inflatable craft in an inflated or uninflated state, except lightvessels, fire floats and dredgers	I
(12) Specially designed components for ships and surface effect vehicles specified in heads (1) to (11) above (inclusive), the following–	
(a) (a) advanced hull forms incorporating any of the following–	
(i) stepped hulls for hydrofoil vessels;	A
(ii) hulls for air cushion vehicles with trapezoidal platforms;	A
(iii) hulls for surface-effect vehicles with catamaran-like walls; or	A
(iv) hulls for wing-in-ground effect vehicles	A
(b) (b) fully submerged subcavitating or super-cavitating hydrofoils	A
(c) (c) lightweight structural components for hydrofoil vessels, SWATH vessels and surface-effect vehicles, constructed using anisotropic,	A

	orthotropic or sandwich construction methods	
(d)	(d) flexible skirts, seals and fingers for surface-effect vehicles	A
(e)	(e) systems for automatically controlling the stability of hydrofoil vessels, SWATH vessels or surface-effect vehicles	A
(f)	(f) power transmission shaft systems incorporating composite material components, for hydrofoil vessels and surface-effect vehicles	A
(g)	(g) lightweight, high capacity (K factor greater than 150) gearing (planetary, cross-connect and multiple input/output gears and bearings) for hydrofoil vessels and surface-effect vehicles	A
(h)	(h) water-cooled electrical propulsion machinery (motor and generator), including sectored-disc and concentric-drum motors for DC homopolar machines, for hydrofoil vessels and surface-effect vehicles	A
(i)	(i)superconducting electrical propulsion machinery for hydrofoil vessels, SWATH vessels	A

	and surface-effect vehicles	
(j)	(j) lift fans for surface-effect vehicles, rated at more than 400 hp	A
(k)	(k) water-jet propulsor systems rated at 3,000 input hp or more for hydrofoil vessels and surface-effect vehicles	A
(l)	(l) moisture and particulate separator systems capable of removing 99.9% of particles larger than two micrometres in diameter with a maxium pressure loss of 1.6 kPa (16 millibar), for gas turbine engine air inlets for hydrofoil vessels, SWATH vessels and surface-effect vehicles	A
(m)	(m) underwater hulls and struts for SWATH vessels	A
	(13) Water-screw propellers, the following–	
(a)	(a) supercavitating propellers rated at more than 10,000 hp	A
(b)	(b) contrarotating propellers rated at more than 20,000 hp	A
(c)	(c) controllable-pitch propellers rated at more than 20,000 hp	A
(d)	(d) ventilated, base-ventilated and super-ventilated propellers	A

IL1417	Submersible systems, including those incorporated in a submersible vehicle, the following–	
	(1) Automatically controlled atmosphere-regeneration systems specially designed or modified for submersible vehicles which, in a single chemical reaction cycle, ensure carbon dioxide removal and oxygen renewal	A
	(2) Systems specially designed or modified for the automated control of the motion of a submersible vehicle using navigation data and having closed-loop servo-control(s) having any of the following characteristics–	
	(a) (a) capable of moving the vehicle to within ten metres of a predetermined point in the water column;	A
	(b) (b) capable of maintaining the position of the vehicle within ten metres of a predetermined point in the water column; or	A
	(c) (c) capable of maintaining the position of the vehicle within ten metres while following a cable on or under the sea bed	A
	(3) Underwater vision systems, the following–	
	(a) (a) television systems (consisting of camera, lights, monitor and signal transmission equipment) specially designed or modified	A

for remote operation with a submersible vehicle, with a limiting resolution, when measured in air, greater than 500 lines using IEEE standard 208/1960 or any equivalent standard

In this sub-head "limiting resolution" is a measure of resolution expressed in terms of the maximum number of lines per picture height discriminated on a test chart.

(b) (b) systems specially designed or modified for remote operation with a submersible vehicle employing techniques to minimize the effects of backscatter, such as range-gated illuminators ... ... A

(4) Remotely controlled articulated manipulators specially designed or modified for use with submersible vehicles and having any of the following characteristics–

(a) (a) systems which control the manipulator using information from sensors which measure force or torque applied to an external object, distance from an external object, or tactile sense between the manipulator and an external object A

(b) (b) controlled by proportional master-slave techniques A or by using a dedicated stored-programme computer; or ... ...

(c) (c) capable of exerting a force of 250 Newtons or more or a torque of 250 Newton-metres or more and using titanium based alloys or fibrous and filamentary composite materials in their structural members ... ... A

(Note also the entry in Group 3D relating to robots.)

(5) Photographic cameras and associated equipment specially designed or modified for use under water, having a film format of 35 mm or larger and any of the following characteristics–

(a) (a) film advancement of more than 5 frames per second ... ... A

(b) (b) annotation of the film with data provided by a source external to the camera A

(c) (c) taking more than 250 full frame exposures without changing the film A

(d) (d) autofocusing specially designed or modified for use under water ... ... A

(e) (e) for operation at depths greater than 1,000 metres ... ... A

(6) Light systems specially designed or modified for use under water, the following–

	(a) (a) Stroboscopic lights	
	(i) with a light output of more than 150 joules per flash; or	A
	(ii) flash rates of more than 5 flashes per second at a light output energy of 10 joules per flash	A
	(b) (b) Lights and associated equipment capable of operation at depths exceeding 1,000 metres	A
IL1418	Deep submergence vehicles, specially designed or modified associated systems, equipment, components and materials therefor, the following–	
	(1) Deep submergence vehicles, whether or not for operation manned or unmanned, tethered or untethered, capable of operating at depths exceeding 1,000 metres	A
	(2) Specially designed or modified associated systems, equipment, components and materials for the vehicles specified in head (1), including but not limited to pressure housings or pressure hulls propulsion motors and thrusters and hull penetrators or connectors	A
IL1425	Floating docks and software therefor, the following–	
	(1) Floating docks specially designed for use at remote locations, without support from shore bases	A
	(2) Floating docks specially equipped to permit the operation, maintenance or repair of nuclear reactors	A

	(3) Floating docks having both of the following characteristics	A
	(a) (a) a lifting capacity of more than 40,000 short tons (36,364 tonnes); and	
	(b) (b) larger than 120 metres in length and 30 metres in width, measured between the pontoons.	
	(4) Specially designed software for computer-controlled pumping and flooding systems for the floating docks specified in heads (1) to (3) above (inclusive) to permit the docking of listing vessels	A
(For technology relating to this entry, see the entry in Group 4 relating thereto.)		
IL1431	Marine gas turbine engines for marine propulsion or shipboard power generation, whether originally designed as such or adapted for such use, and specially designed components therefor	A
IL1460	Aircraft and helicopters, aircraft engines and aircraft and helicopter equipment, the following–	
	(1) Aircraft and helicopters, having a maximum all up weight of 680 Kg or more, incorporating or equipped with equipment specified in Group 1, other than in the entry in that group relating to military aircraft and helicopters, or in the entries in Group 3 relating to navigation, direction finding, radar and airborne communication equipment, or to compasses, gyroscopes,	A

	accelerometers and inertial equipment	
	(2) Specially designed components for aircraft and helicopters specified in head (1) above	A
	(3) Aircraft and helicopters having a maximum all up weight of 680 Kg or more	L,ZL
	(4) Helicopter power transfer systems	A
except those for use in civil helicopters only, the following–		
	(a) (a) those which have been in civil use in bona fide civil helicopters for more than 8 years; and	
	(b) (b) those for replacement in or servicing of specific, previously exported helicopters.	
	(5) Gas turbine engines and auxiliary power units (APUs) for use in aircraft or helicopters	A
except those for use in civil aircraft or helicopters only, the following–		
	(a) (a) jet, turboprop and turboshaft aircraft engines in civil use in bona fide civil aircraft or civil helicopters for more than 8 years; and	
	(b) (b) gas turbine powered aircraft APUs in civil use in bona fide civil aircraft or civil helicopters for more than 8 years.	

	(6) Specially designed components for gas turbine engines, APUs and helicopter power transfer systems specified in heads (4) and (5) above, the following–	
	(a) (a) hot-section components	A
	(b) (b) engine control system components	A
	(c) (c) gas turbine engine or APU rotor system components (including bearings).	A
	(For technology relating to this entry, see the entry in Group 4 relating thereto.)	
IL1465	Spacecraft and launch vehicles, the following–	
	(1) Spacecraft, manned or unmanned, (not including their payloads unless these fall within a description set out elsewhere in this Schedule), except scientific space probes which do not contain equipment specified either in head (3) below or elsewhere in this Schedule	A
	(2) Launch vehicles for spacecraft specified in head (1) above	A
	(3) Propulsion systems, guidance equipment, attitude control equipment; and on-board communication equipment for remote control of the equipment specified in heads (1) and (2) above	A
	(4) Specially designed components for any of the foregoing	A
IL1485	Compasses, gyroscopes (gyros), accelerometers and inertial equipment, the following–	

(1) Accelerometers with a threshold of 0.005 g or less, or a linearity error within 0.25% of full scale output, or both, which are designed for use in inertial navigation systems or in guidance systems, of all types	A
(2) Automatic pilots used for purposes other than aircraft control and specially designed integration software therefor, except marine types for surface vessels	A
(3) Gyro compasses with provision for determining and transmitting ship's level reference data (roll, pitch) in addition to own ship's course data	A
(4) Gyro-astro compasses and other devices which derive position or orientation by means of automatically tracking celestial bodies	A
(5) Gyro-stabilisers used for purposes other than aircraft control, except those for stabilising an entire surface vessel	A
(6) Gyros with a rated free directional drift rate of less than 0.5° (1 Sigma or root mean square) per hour in a 1 g environment	A
(7) Continuous output accelerometers which use servo or force balance techniques and gyros, both specified to function at acceleration levels greater than 100 g	A
(8) Inertial or other equipment using accelerometers specified in heads (1) or (7) above or gyros specified in heads (6) or (7) above, and systems incorporating such equipment and specially	A

	designed integration software therefor	
	(9) Integrated flight instrument systems which include gyro-stabilisers or automatic pilots for aircraft and specially designed integration software therefor	A
except those systems integrated solely for VOR/ILS navigation and approaches.		
	(10) Specially designed testing, calibration and alignment equipment for the equipment specified in heads (1) to (9) above (inclusive)	A
	(11) Specially designed components and software for the equipment specified in heads (1) to (10) above (inclusive)	A

GROUP 3F

Note. Goods specified in the heads of this Group may also be specified in Group 1 of this part of this Schedule.

Electronic Equipment including Communications and Radar

IL1501	Navigation, direction finding, radar and airborne communication equipment, the following–	
	(1) Airborne communication equipment having any of the following characteristics–	
	(a) (a) designed to operate at frequencies greater than 156 MHz	A
	(b) (b) incorporating facilities for–	
	(i) the rapid selection of more than 200 channels per equipment, or	A

(ii)	equipment using frequency synthesis techniques	A
	except conventional equipment operating in the frequency range of 108 to 136 MHz with 720 channels or fewer at not less than 25 kHz spacing;	
( )	( ) rated for continuous operating over a range of ambient temperatures extending from below –55°C to above +55°C	A
	or	
(d)	(d) designed for modulating methods employing any form of digital modulation using time and frequency redundancy such as “Quantized Frequency Modulation” (QFM)	A
	(2) Airborne navigation and direction finding equipment, the following–	
(a)	(a) equipment designed to make use of the Doppler frequency phenomena	A
(b)	(b) equipment utilising the rectilinear propagation of electromagnetic waves having a frequency less than 4 × 10u21u24 Hz (0.75 microns) except standard commercial airborne equipment needed to equip civil aircraft or as normal	A

	standard equipment incorporated in civil aircraft being exported for civil commercial use, provided such equipment is in conformity with ICAO standards and assures no function exceeding those resulting from such standards, is not designed to use satellite-broadcast navigation signals and is not designed to make use of hyperbolic grids at frequencies greater than 3MHz, such as Marker beacons, ILS, VOR (“OMNI”), Omega, Loran A and B;	
(c)	(c) radio altimeters, the following–	
(i)	pulse modulated	A
(ii)	frequency modulated having a displayed electrical output accuracy better than .266 0.914 m over the whole range between 0 and 30.4 m or .266 3% above 30.4 m	A
(iii)	frequency modulated using other than conventional techniques	A
(d)	(d) direction finding equipment, operating at frequencies greater than 5 MHz, except direction finding equipment specially designed for search and rescue purposes and operating under	A

crystal control at a frequency of 121.5 MHz or on alternating frequencies of 121.5 MHz and 243 MHz and personal locator beacons operating on such frequencies including those also having an additional channel selectable for voice mode only

(e)	(e) equipment rated for continuous operation over a range of ambient temperatures extending from below –55°C to above +55°C	A

(3) Airborne radar equipment ... ... A

(4) Ground and marine radar equipment, the following–

(a)	(a) equipment operating at a frequency of less than 1.5 GHz and having a peak output power from the transmitter greater than 2.5 MW	A
(b)	(b) equipment operating at a frequency within the range 1.5 to 3.5 GHz and having a peak output power from the transmitter greater than 1.5 MW	A
(c)	(c) equipment operating at a frequency within the range from 3.5 to 6.0 GHz and having a peak output power from the transmitter greater than 1 MW	A

(d)	(d) equipment operating at a frequency within the range from 6.0 GHz to 10.5 GHz and having a peak output power from the transmitter greater than 500 kW	A
(e)	(e) equipment operating at a frequency of less than 3.5 GHz and having an 80% or better probability of detection for a 10 sq m target at a free space range of 250 nautical miles	A
(f)	(f) equipment operating at a frequency within the range from 3.5 to 10.5 GHz and having an 80% or better probability of detection for a 10 sq m target at a free space range of 100 nautical miles	A
(g)	(g) equipment utilising other than pulse modulation with either a constant or a staggered pulse repetition frequency, in which the carrier frequency of the transmitted signal is not changed deliberately between groups of pulses, from pulse to pulse or within a single pulse, except civil airport radar equipment using a carrier frequency that may change from pulse to pulse between two fixed frequencies	A

		separated in time and in frequency by constant magnitudes	
	(h)	(h) equipment using a Doppler technique other than moving target indicator systems using a conventional double or triple pulse delay line cancellation technique;	A
except equipment designed for aerial navigation surveillance or radar control at civil airports			
	(i)	(i) equipment including any digital signal processing techniques used for automatic target tracking	A
	(j)	(j) equipment including other than signal processing techniques with a facility for electronic tracking	A
	(k)	(k) equipment including other than conventional signal processing techniques	A
	(l)	(l) equipment not specified above operating at a frequency of more than 10.5 GHz or at a frequency not in normal civil use	A
In this head cumulative probability of detection must be determined according to the following parameters–			
	(a)	(a) radial closing velocity of the target 610 m per second;	

	(b) (b) probability of false alarm 10u2–u28;	
	(c) (c) operating factor 3 dB;	
	(d) (d) fluctuation of the target in accordance with Rayleigh distribution.	
	(5) Ground and marine equipment for use with airborne navigation equipment utilising the constant velocity; the rectilinear propagation characteristics of electromagnetic waves having frequency less than 4 x 10u21u24 Hz (0.75 micron)	A
except ground and marine equipment provided the ground equipment is for civil use in association with civil airborne equipment, and		
	(i) is in conformity with ICAO standards and assures no function exceeding those resulting from such standards;	
	(ii) is not designed to make use of hyperbolic grids at frequencies greater than 3 MHz;	
	(6) Ground and marine direction finding equipment operating at frequencies greater than 30 MHz	A
	(7) Ground or marine navigation and geodetic positioning systems designed for use with satellite-provided timing, positioning or navigation information, except equipment restricted to use with TRANSIT satellite systems or other systems not specified in this entry, provided that they	A

do not incorporate equipment specified in head (8) below

(8) Timing receivers whose only function is automatically to provide time derived from satellite signals to within 1 millisecond of Universal Coordinate Time (UCT) or better ... ... A

(9) Specially designed components and software for the apparatus in heads (1) to (8) above (inclusive) and specialised testing or calibrating equipment and training or simulating equipment for the apparatus in heads (2) to (8) above (inclusive) ... ... A

except

(a) (a) Secondary radar equipment specified in heads (3) or (4) above specially designed for civil air traffic identification and control purposes;

(b) (b) Equipment assemblies for civil marine automatic radar plotting aids or electronic relative motion analyzers designed to achieve the requirements published by the International Maritime Organization in accordance with the Safety of Life at Sea (SOLAS) conventions, provided the designed tracking speeds do not exceed relative values of greater than 150 knots (77.1 metres/ second);

	(c) (c) Ground radar of the hand-held or automobile-mounted type used for vehicle speed monitoring by police authorities and operating in the frequency band from 10.5 to 10.55 GHz.	
IL1502	Communication, detection or tracking equipment of a kind using ultra-violet radiation, infra-red radiation or ultrasonic waves, and specially designed software and components therefor, ... except (1) Industrial equipment of a kind using cells not specified in the entry in this Group relating to photosensitive components; (2) Equipment used for industrial and civilian intrusion alarms, traffic and industrial movement control and counting systems, medical applications, industrial inspection, sorting or analysis of the properties of materials, or for simple educational or entertainment purposes; (3) Flame detectors for industrial furnaces; (4) Equipment of a kind using a single detector cell with no scanning of the detector and used for laboratory or industrial non-contact temperature measurement; (5) Instruments capable of measuring radiated power or energy and having a response time constant greater than 10 milliseconds; (6) Equipment designed for measuring radiated power or energy for laboratory, agricultural or industrial	A

	purposes using a single detector cell with no scanning of the detector, and single detector cell assemblies or probes specially designed therefor, having a response time constant greater than 1 microsecond; (7) Infra-red geodetic equipment using a lighting source other than a laser and manually operated, or using a lighting source (other than a laser or a light-emitting diode) remote from the measuring equipment; (8) Equipment of a kind using ultrasonic waves, the following– (a) (a) which operates in contact with a controlled material to be inspected or which is used for industrial cleaning, sorting or materials handling, emulsification or homogenisation; (b) (b) used for underwater communications, designed for operation with amplitude modulation and having a communications range of 500 m or less, a carrier frequency of 40 to 60 kHz, and a carrier power supplied to the transducer of 1 W or less.	
IL1510	Marine or terrestrial acoustic or ultrasonic systems or equipment, using acoustic travel time differences, specially designed for positioning surface vessels or underwater vehicles, or	A

for detecting or locating underwater or subterranean objects or features, and specially designed components of such systems or equipment, including but not limited to hydrophones, transducers, beacons, towed hydrophone arrays, beamformers and geophones, other than moving coil or moving magnet electromagnetic geophones, and specially designed software therefor ... ...

(1) Marine systems or equipment, the following–

(a) (a) active transmitting, or transmitting and receiving systems or equipment, the following:

(i) depth-sounders of a kind used solely for measuring the depth of water or the distance of submerged or buried objects vertically below the equipment;

(ii) horizontally-operated object detection or location systems having all the following characteristics:

(a) a transmitting frequency of 15 kHz or greater;

(b) a sound pressure level less than 250 dB (reference 1 micropascal at 1 metre) for apparatus with an operating frequency of between 15 and 30 kHz and with no decibel limitation for apparatus operating at frequencies of 30 kHz or greater;

(c) a transmission capability limited to .266 10% of the design centre frequency;

(d) a design incapable of withstanding pressure during normal operation at depths greater than 1,000 metres; and

(e) a display range of 5,000 metres or less;

(iii) electronic noise sources designed for vertically directional use only;

(iv) mechanical noise sources;

(v) chemical noise sources;

(b) (b) passive receiving equipment, whether or not related in normal application to separate equipment, the following–

(i) acoustic hydrophones and transducers, having all the following characteristics:

(a) incorporating sensitive elements made of piezoelectric ceramics or crystal and made with a sensitivity no greater than – 192 dB (reference 1 volt per micropascal);

(b) a design incapable of operating at depths greater than 100 metres; and

(c) independently mounted or configured and incapable of assembly by the user into a towed hydrophone array.

(c) (c) systems or equipment positioning surface vessels or underwater vehicles, having all the following characteristics:

(i) their control capability is limited to release and basic transponder capabilities;

(ii) they are not capable of processing responses from more than four beacons in the calculation of a single point, and have neither devices nor software performing correction of velocity-of-propagation errors for point calculation, nor any coherent signal processing means;

(iii) they are capable only of operating within a range of less than 1,000 metres or, if capable of operating beyond a range of more than 1,000 metres, are not capable of achieving positional accuracy of within 20 metres when measured at a range of 1,000 metres;

(iv) transducers, acoustic modules or hydrophones therefor are not designed to withstand pressure during normal operation at depths greater than 1,000 metres; and

(v) beacons therefor are not designed to withstand pressure during normal operation at depths greater than 1,000 metres, do not have

	oscillators with a stability greater than 10u2–u25 over periods of 24 hours, and do not use complex codes or beamformers which have shaded or formed beams. (2) Terrestrial systems or equipment having both of the following characteristics– (a) (a) not reasonably capable of conversion by the user to underwater or marine applications specified in this entry; and (b) (b) not employing geophones or other transducers specified in this entry. In this entry "passive hydrophone sensitivities" are based on sensitivity being defined as 20 times the logarithm to the base 10 of the ratio of rms output voltage to a 1 volt reference, when the hydrophone sensor is placed in a plane wave acoustic field having an rms pressure of 1 micropascal. For example, a hydrophone of – 160 dB (reference 1 volt per micropascal) would yield an output voltage of 10u2–u28 volts in such a field, while one of – 180 dB sensitivity would yield only 10u2–u29 volts output.	
IL1514	Pulse modulators of a kind used for providing electric impulses of peak power exceeding 20 MW or of a duration of less than 0.1 microsecond, or with a duty cycle in excess of 0.005;	A

	and pulse transformer and pulse-forming equipment and delay lines, being components specially designed for such pulse modulators	
IL1516	Radio receivers, the following–	
	(1) Panoramic radio receivers, being receivers which search or scan automatically a part of the electromagnetic spectrum and indicate or identify the received signals, except ancillary equipment for receivers with which the frequency searched does not exceed a bandwidth of 20MHz or does not incorporate a raster or storage display capability	A
	(2) Digitally controlled radio receivers, whether or not computer controlled, which search or scan automatically a part of the electromagnetic spectrum and in which the switching operation takes less than 10 milliseconds and which indicate or identify the received signals	A
	except non-ruggedised digitally controlled pre-set type radio receivers designed for use in civil communications which have 200 selective channels or fewer.	
	(3) Receivers for spread spectrum and frequency agile systems operating within a total transmitted bandwidth which is:	
	(a) (a) 100 or more times greater than the bandwidth of any one information channel; and	
	(b) (b) in excess of 50 kHz	A

	(4) Receivers incorporating digital signal processing, except receivers specially designed for internationally allocated civil frequency bands only and which do not permit user-accessible reprogrammability of the digital signal-processing circuits	A
	(5) Specially designed components, accessories and software for the receivers specified in heads (1) to (4) above (inclusive)	A
IL1517	Radio transmitters (except radio relay communication equipment specified in the entry in this Group relating thereto), the following–	
	(1) Transmitters or transmitter amplifiers designed to operate at output frequencies greater than 960 MHz	A
	(2) Transmitters or transmitter amplifiers designed to provide any of the following features:	
	(a) (a) any system of pulse modulation other than amplitude-, frequency-, or phase-modulated television or telegraphic transmitters or pulse-width modulated sound broadcasting transmitters	A
	(b) (b) rated for operation over a range of ambient temperatures extending from below –40°C to above +60°C	A
	(3) Transmitters for spread spectrum and frequency agile systems having a total transmitted bandwidth which is:	

(a) (a) 100 or more times greater than the bandwidth of any one information channel, and

(b) (b) in excess of 50 kHz ... ... A

(4) Specially designed components for the transmitters specified in heads (1) to (3) above (inclusive)

Except transmitters or transmitter-amplifiers, or systems containing such equipment, or accessories and sub-assemblies therefor, with the following characteristics–

(a) (a) Specially designed for medical applications and operating at ISM frequencies;

(b) (b) Having an output of not more than 10 W, which are specially designed for:

(1) Industrial or civil intrusion detection and alarm;

(2) Industrial and traffic detection, counting, speed measurement, identification and movement control;

(3) Carrying the information from the equipment above, or the information from environmental, air or water, pollution detection or measurement systems.

(c) (c) Transmitters using wideband amplifiers designed for non-frequency – agile civil

	applications, such as television and mobile service.	
IL1518	Telemetering and telecontrol equipment suitable for use with aircraft (piloted or pilotless), missiles (guided or unguided) or space vehicles (guided or unguided) and specially designed test equipment therefor	A
	except equipment specially designed to be used for remote control of toys such as model planes and boats and having electric field strength of no more than 200 microvolts per metre at a distance of 500 metres	
IL1519	Communication transmission equipment (single and multi-channel), including terminal, intermediate amplifier or repeater equipment and multiplex buses, and multiplex equipment used for communications within or between communication or other equipment and systems, by line, cable, optical fibre or radio means, and associated modems and multiplex equipment, the following–	
	(1) Equipment employing analogue transmission techniques with analogue input and output, including but not limited to frequency division multiplex (FDM), designed to deliver, carry or receive baseband frequencies higher than those in sub-heads (a) and (b) below into, or in, a communications system–	
	(a) (a) in the case of equipment suitable for underwater cable, frequencies higher than 300 kHz	A

(b) (b) in all other cases, frequencies higher than 19 MHz	A
(2) Equipment employing digital transmission techniques designed for operation at a total bit rate at the highest level multiplex point exceeding 8.5 Megabits per second and having analogue input and output including, but not limited to, pulse code modulation (PCM) designed for use on communications circuits	A
(3) Data communications equipment employing digital transmission with digital input and output, including telegraphic and data transmission, the following–	
(a) (a) equipment designed for operation at a data signalling rate in bits per second, excluding servicing and administrative channels, numerically exceeding either–	
(i) 9,600 or 320% of the channel (or sub-channel) bandwidth in hertz, when using FDM voice channel; or	A
(ii) 19,200 when using baseband	A
(b) (b) equipment employing an automatic error-detection and correction system in which retransmission is not required for correction and the data signalling rate exceeds 300 bits per second	A

(c)	(c) statistical multiplexers designed for operation at a data signalling rate in bits per second, excluding servicing and administrative channels, numerically exceeding either 4,800 or 160% of the channel (or sub-channel) bandwidth in hertz	A
	(4) Components and accessories and software specially designed for equipment specified in heads (1) to (3) above (inclusive) and test equipment specially designed for the equipment specified in head (2) above	A

except

(a)	(a) Telemetering, telecommand and telesignalling equipment designed for industrial purposes, together with data transmission equipment not intended for the transmission of written or printed text, and specially designed components, accessories and test equipment therefor. By telemetering, telecommand and telesignalling equipment is meant sensing heads for the conversion of information into electrical information, the systems used for	

its long-distance transmission, the processes used to translate electrical information into coded data (telemetering), into control signals (telecommand), and into display signals (telesignalling);

(b) (b) Facsimile equipment other than that specified in the entry relating to cryptographic equipment;

(c) (c) Equipment employing exclusively the direct current transmission technique;

(d) (d) Electronic measuring equipment suitable for use with PCM transmission equipment defined in CCITT Recommendation series G.700 to 746 (ITU Geneva) for PCM up to 8.5 Megabits per second.

In this entry–

"data signalling rate" takes into account that, for non-binary modulation systems, "bauds" and "bits per second" are not equal. Bits for coding, checking and synchronisation should be included in the calculation of "bits per second"; and

"bandwidth", for data communications equipment designed to operate in one voice channel, is 3,100 Hz and for voice frequency telegraph systems designed to International Telegraph and Telephone Consultative Committee (CCITT) and International Radio Consultative Committee (CCIR) standards "bandwidth" is the number of channels times the channel spacing.

IL1520	Radio relay communication equipment and specially designed test equipment and software, the following–	
	(1) Radio relay communication equipment designed for use at frequencies exceeding 960 MHz	A

except

(a) (a) Microwave radio links for fixed civil installations operating at fixed frequencies not exceeding 19.7 GHz, employing analogue transmission with a capacity of up to 2,700 voice channels of 4 kHz each or of a television channel of 6 MHz maximum nominal bandwidth and associated sound channels;

(b) (b) Microwave radio links for fixed civil installations operating at fixed frequencies not exceeding 19.7 GHz, employing digital transmission techniques designed for operation at a total bit rate not exceeding 8.5 Mbit per second;

	(c) (c) Ground communication radio equipment for use with temporarily fixed services operated by civilian authorities and designed to be used at fixed frequencies not exceeding 15 GHz with a power output of not more than 5 W;	
	(d) (d) TV-receive-only (TVRO) stations for satellite reception specially designed for use at fixed frequencies meeting ITU standards in civil television or sound radio systems in the following frequency ranges–	
	(i) S-band: 2.5 – 2.69 GHz	
	(ii) C-band: 3.4 – 4.2 GHz	
	(iii) kU-and kA-band: 4.5 – 4.8 GHz, 10.7 – 12.75 GHz	
	(2) Stand-alone radio transmission media simulators and channel estimators, and specially designed software therefor, specially designed for testing equipment specified in head (1) above, except those in which the adjustments are made only manually	A
	(3) Specially designed components and accessories for the equipment specified in heads (1) and (2) above	A
IL1521	Solid-state amplifiers and specially designed components and accessories having any of the following characteristics–	
	(1) Exceeding a maximum output power of 2 kW at	A

operating frequencies between 10 and 35 MHz inclusive ... ...

(2) Exceeding a maximum output power of 50 W at operating frequencies between 35 and 400 MHz; or ... ... A

(3) A product of the maximum output power times the maximum operating frequency of more than 2 × 10u21u20 W.Hz at operating frequencies exceeding 400 MHz A

exceptSolid state amplifiers which:

(a) (a) are specially designed for community television distribution systems; or

(b) (b) have a bandwidth not exceeding 10 MHz.

In this entry–

“bandwidth” means the band of frequencies over which the power amplification does not drop to less than one-half of its maximum value.

IL1522 Lasers and laser systems and specially designed parts and components therefor (including amplification stages) and any equipment containing lasers or designed to contain lasers, the following–

(1) Lasers and specially designed components and parts therefor, ... A

except, save when specially designed for equipment specified in head (2) below,

(a) (a) argon, krypton or non-tunable dye lasers, having one of the following sets of characteristics–

(i) an output wavelength between 0.2 and 0.8 micrometre, a pulsed output energy not exceeding 0.5 joule per pulse and an average or continuous-wave maximum rated single-or multi-mode output power not exceeding 20 W;*or*

(ii) An output wavelength between 0.8 and 1.0 micrometre, a pulsed output energy not exceeding 0.25 joule per pulse and an average or continuous-wave maximum rated single-or multi-mode output power not exceeding 10 W;

(b) (b) helium-cadmium, nitrogen, and multi-gas lasers not specified elsewhere in this entry, having both the following characteristics–

(i) an output wavelength shorter than 0.8 micrometre; and

(ii) a pulsed output energy not exceeding 0.5 joule per pulse and an average or continuous wave maximum rated single-or multi-mode output power not exceeding 120 W;

(c) (c) helium-neon lasers with an output wavelength shorter than 0.8 micrometre;

(d) (d) ruby-lasers with both the following characteristics–

(i) an output wavelength shorter than 0.8 micrometre; and

(ii) a pulsed output energy not exceeding 20 joules per pulse;

(e) (e) COd22, CO or CO/COd22 lasers with either of the following characteristics–

(i) an output wavelength in the range of 9 to 11 micrometres and a pulsed output energy not exceeding 2 joules per pulse and a maximum rated average single-or multi-mode output power not exceeding 1.2 kW or a continuous-wave maximum rated single– or multi-mode output power not exceeding 5.0 kW; or

(ii) an output wavelength in the range of 5 to 7 micrometres and having a continuous wave maximum rated single-or multi-mode output power not exceeding 50 W;

(f) (f) Nd: YAG lasers having an output wavelength of 1.064 micrometres and either of the following characteristics–

(i) a pulsed output energy not exceeding 0.5 joules per pulse and a maximum rated average single- or multi-mode output power not exceeding 10 W or a continuous wave maximum rated single-or multi-mode output power not exceeding 50 W; or

(ii) a pulsed output energy not exceeding 10 joules per pulse with a pulse width not less than 50 microseconds and a maximum rated average single-or multi-mode output power not exceeding 50 W;

(g) (g) Nd: Glass lasers having both the following characteristics–

(i) an output wavelength in the range of 1.05 to 1.06 micrometres; and

(ii) a pulsed output energy not exceeding 2 joules per pulse;

(h) (h) tunable CW dye lasers having both the following characteristics–

(i) an output wavelength shorter than 0.8 micrometre; and

(ii) an output not exceeding an average or continuous wave maximum rated single-or multi-mode output power of 1 W;

(i) (i) tunable pulsed lasers (for argon and krypton lasers see (a) above), including dye having all of the following characteristics–

(i) an output wavelength between 0.15 and 0.8 micrometre;

(ii) a pulse duration not exceeding 100 nanoseconds;

(iii) a pulsed output energy not exceeding 0.5 joule per pulse;*and*

(iv) an average power not exceeding 10 W;

(j) (j) single-element semi-conductor lasers having a wavelength shorter than 1 micrometre and designed for and used in the video and audio reproducers, point of sale price scanners, electronic printers and electronic copiers referred to at sub-heads (2)(m), (n), (s) and (t) below.

(2) Laser systems and equipment containing lasers, and specially designed components therefor ... ... A

except the following systems and equipment containing lasers of the types excluded from head (1) above–

(a) (a) equipment specially designed for industrial and civilian instrusion detection and alarm systems;

(b) (b) equipment specially designed for medical applications;

(c) (c) equipment for educational and laboratory purposes;

(d) (d) equipment specially designed for traffic and industrial movement control and counting systems;

(e) (e) equipment specially designed for the detection of environmental pollution;

(f) (f) optical spectrometers and densitometers;

(g) (g) equipment containing continuous wave helium-neon gas lasers, other than laser measuring systems described in head (3) below;

(h) (h) equipment for cutting or bonding textiles;

(i) (i) equipment for cutting paper;

(j) (j) equipment containing lasers for drilling diamond dies for the wire drawing industry;

(k) (k) electronic scanning equipment with auxiliary electronic screening unit specially designed for printing processes, including such equipment when used for the production of colour separations;

(l) (l) laser-radar (lidar) equipment specially designed for surveying or meteorological observation;

(m) (m) consumer-type reproducers for video or audio discs, employing non-erasable media;

(n) (n) point of sale price scanners;

(o) (o) equipment designed for surveying purposes if it is not capable of measuring range;

(p) (p) equipment specially designed for the marking of components;

(q) (q) specially designed gravure (printing plate) manufacturing equipment;

(r) (r) equipment specially designed for visual entertainment purposes (laser light shows) provided it has no holographic capability;

(s) (s) electronic printers including those capable of being used with digital computers, not exceeding 2000 lines (30 pages) per minute or 300 characters per second;

(t) (t) electronic copiers, including those capable of being used with digital computers, not exceeding 30 pages per minute and which do not include any of the following–

(i) optical character recognition (OCR) equipment which is not specified in Group 3G, head (7);

(ii) digitising equipment which is not specified in Group 3G, head (7);*or*

(iii) image enhancement capability;

	(3) Measuring systems which have both of the following characteristics–	A
	(a) (a) contain a laser;*and*	
	(b) (b) maintain for at least 48 hours over a temperature range .26610K around a standard temperature and at a standard pressure–	
	(i) a resolution over their full scale of .2660.1 micrometre or better*and*	
	(ii) an accuracy of .266 1 part per million or better	
	(4) Particle measuring systems employing helium-neon lasers, designed for measuring particle size and concentration in gases, which have both of the following characteristics	A
	(a) (a) capable of measuring particle sizes of 0.3 micrometre or less;*and*	
	(b) (b) capable of characterising Class 10 clean air or better.	
	In this entry "tunable" means the ability of a laser to produce an output at any wavelength within its tunable range. A line-selectable laser which can operate only on discrete wavelengths is not considered tunable.	
IL1526	Cable, wire and optical fibres, and components and accessories, the following–	
	(1) Cable (including coaxial cable, but excluding oil well logging cable) and wire, coated with or insulated with any of the	A

materials specified in sub-head (1)(b) of the entry in Group 3I relating to fluorocarbon compounds ... ...

(2) Other cable and optical fibres, the following–

(a) (a) underwater communication cable, the following–

(i) reversed-twist, double-armoured cable specially designed for towing or suspending, and communicating with, submerged devices ... ... A

(ii) unarmoured or single-armoured ocean cable having an atenuation of 1.62 dB/km (3.0 dB per nautical mile) or less, measured at a frequency of 600 kHz ... ... A

(b) (b) coaxial cable with an inner diameter of the outer conductor of the core greater than 14 mm, having–

(i) an air dielectric in which the spacing is accomplished by discs, beads, spiral, screw or any other means;

(ii) a foam dielectric and a solid copper or aluminium outer conductor ... ... A

(c) (c) optical-fibre communication cable or optical fibres therefor, having any of the following characteristics–

(i) an attenuation at any operating wavelength of 3 dB/km or less ... ... A

(ii) optical fibres capable of withstanding a "proof A

	test" tensile stress of 1.1 x 10u29 N/mu22	
(iii)	specially designed for underwater use	A
(iv)	specially designed to be insensitive to nuclear radiation	A
	(d) (d) optical fibres for sensing purposes, having any of the following characteristics	A
(i)	specially fabricated either compositionally or structurally, or modified by coating, to be acoustically, thermally, inertially, electro-magnetically or nuclear radiation sensitive	A
(ii)	modified structurally or by coating to have either very low ("beat length" greater than 50 cm) or very high ("beat length" less than 5 cm) birefringence	A
	(e) (e) secure communications cable, coaxial or multi-conductor, protected by mechanical or electrical means from physical damage or intrusion in such manner that communications security is maintained between terminals without the need for additional encoding and scrambling equipment, except cable which is only armoured by a tough outer sheath or screened electro-magnetically	A

	(f) (f) components and accessories specially designed for the optical fibres or cable specified in this head, including fibre-optic bulkhead or hull penetration connectors impervious to leakage at any depth for use in ships or vessels, and multiport fibre-optic couplers except connectors for use with optical fibres or cable with a repeatable coupling loss of 0.5 dB or more. In this entry– "beat length" means the distance over which two orthogonally polarised signals, initially in phase, must pass in order to achieve 2 radians phase difference; and "proof test" consists of on-line or off-line production screen testing that dynamically applies a prescribed tensile stress over a 0.5 to 3 m length of fibre at a running rate of 2 to 5 m per second while passing between capstans approximately 15 cm in diameter. The ambient temperature is a nominal 20°C and relative humidity a nominal 40%.	A
IL1527	Cryptographic equipment and ancillary equipment (such as teleprinters, perforators, vocoders, visual display units) designed to ensure secrecy of information transmitted via communications media (such as telegraphy, telephony,	A

facsimile, video and data communications) or of stored information, specially designed components therefor and software controlling or computers performing the functions of such cryptographic equipment ... ...

except simple cryptographic devices or equipment only ensuring the privacy of communication as follows–

(a) (a) Equipment for voice transmission making use of fixed frequency inversions or fixed band scrambling techniques in which the transposition changes occur not more frequently than once every 10 seconds;

(b) (b) Standard civil facsimile and video equipment designed to ensure the privacy of communications by an analogue transmission using non-standard practices for intended receivers only (video system equipment effecting the transposition of analogue data);

(c) (c) Video systems for pay television and similar restricted audience television including industrial and commercial television equipment using other than standard commercial sweep systems;

This entry includes but is not limited to the following–

(a) (a) video systems which use a digital transmission or digital techniques to modify an analogue transmission for video or facsimile secrecy;

(b) (b) receivers and transmitters for spread spectrum and frequency agile systems which are more precisely defined in the entries in this Group relating to radio receivers and radio transmitters.

IL1529	Electronic equipment for testing, measuring (eg time interval measurement), calibrating or counting, or for microprocessor/microcomputer development, the following–	
	(1) Equipment designed as reference frequency standards for laboratory use and having either of the following characteristics–	
	(a) (a) a long-term drift (ageing) over 24 hours or more of 1 part in 10u21u20 or better; or	A
	(b) (b) a short-term drift (stability) over a period from 1 to 100 seconds of 1 part in 10u21u22 or better	A
	(2) Equipment designed for fixed ground or mobile use and containing a frequency standard or standards having either of the following characteristics–	
	(a) (a) a long-term drift (ageing) over 24 hours or more of 1 part in 10u29 or better; or	A

(b) (b) a short-term drift (stability) over a period from 1 to 100 seconds of 1 part in 10u21u22 or better	A
(3) Instruments designed for use at frequencies exceeding 18 GHz	A
(4) Comb frequency generators designed and rated for use at frequencies exceeding 12.5 GHz	A
(5) Instruments designed for use at frequencies exceeding 1 GHz, the following–	
(a) (a) swept-frequency network analysers, for the automatic measurement of complex equivalent circuit parameters over a range of frequencies	A
(b) (b) specially calibrated microwave instrumentation receivers capable of measuring amplitude and phase simultaneously	A
(c) (c) automatic frequency (heterodyne) converters and transfer oscillators	A
(d) (d) programmable instruments	A
(6) Instruments having both of the following characteristics	A
(a) (a) user-accessible programmability;	
(b) (b) a user-alterable programme	

	and data storage of more than 65,536 bit.	
(7) Test instruments including digital circuit testers; logic state and/or timing analysers; bus analysers; serial data analysers; digital word generators with user-accessible programmability and having any of the following characteristics–		
(a)	(a) specially designed to examine or compare one or more binary coded streams of electrical signals;	A
(b)	(b) a maximum sampling rate of more than 100 MHz;	A
(c)	(c) a maximum of more than 32 channels excluding a maximum of 6 qualifier channels;	A
(d)	(d) a figure of merit of more than 400 where the figure of merit is defined as the product of the maximum sampling rate (in MHz) and the number of input channels (excluding qualifier channels);	A
(e)	(e) a capability of state coupled timing analysis (ie synchronised mode state/timing analysis);	A
(f)	(f) a total acquisition memory for word storage exceeding 32,768 bit with an acquisition memory for bit storage per channel	A

exceeding 1,024 bit;*or* ... ...

(g) (g) a total acquisition memory for word storage exceeding 16,384 bit with an acquisition memory for bit storage per channel exceeding 2,048 bit A

except

(i) logic probes, logic pulsers, digital current tracers (current "sniffers"), signature analysers and other digital circuit testers for observing single events or providing stimuli at single test points;

(ii) logic clips and logic comparators;

(iii) digital word generators capable of operating at a maximum clock rate of 2 MHz or less with word lengths of 8 bit or less;

(8) Microprocessor or microcomputer development instruments or systems including accessories specially designed for microprocessor or microcomputer instruments or systems such as: cross-hosted assemblers, cross-hosted compilers; adapter interfaces for prototypes or emulation probes; debuggers; programmable read-only memory (PROM) programmers; programmable read-only memory (PROM) copiers; so-called "personality" modules capable of developing software or capable of programming microcircuits specified in the entry relating to electronic components in this Group ... ... A

except

microprocessor or microcomputer development instruments or systems which can be used to develop software for, or to programme, a family of microprocessor or microcomputer microcircuits not designed or produced in any country specified in Article 2(iv) where a family consists of microprocessor or microcomputer microcircuits which have the same architecture; the same basic instrument set;*and* the same basic technology, provided–

(a) (a) the instruments or systems can be used only for microprocessor or microcomputer microcircuits having an operand (data) word length of less than or equal to 8 bit and not having an arithmetic logic unit (ALU) wider than 8 bit;*and*

(b) (b) the family contains at least one microprocessor or microcomputer microcircuit which is not specified in the entry relating to electronic components in this Group.

(9) Digital counters, the following–

(a) (a) counters capable of counting successive input signals with less than 5 nanoseconds time difference without prescaling (digital A division) of the input signal; (for counter/timers having a time interval measurement mode, see also head (10) below) ... ...

(b)	(b) counters employing prescaling of the input signal in which the prescaler is capable of resolving successive input signals in less than 1 nanosecond time difference	A
(c)	(c) counters capable of measuring burst frequencies exceeding 100 MHz for a burst duration of less than 5 milliseconds	A

(10) Time interval measuring equipment employing digital techniques, capable of measuring time intervals of less than 5 nanoseconds on a single shot basis ... ... A

(11) Testing equipment rated to maintain specified operating data over a range of ambient temperatures from below –25°C to above +55°C ... ... A

(12) Digital voltage measuring apparatus (with or without electrical outputs) irrespective of the physical units in which calibrated, with a reading speed (from zero to the measured value) faster than 25 accesses per second, except visual quantization apparatus capable of providing an average value, displayed or not, of the results of the measurement and multichannel analysers of all types used in nuclear experimentation and industrial telemeasuring devices in which

a pre-set storage value is used as a basis for measuring, having any of the following characteristics–

(a) (a) a digital resolution over the whole scale greater than 1 part in 200,000 (0.0005%) ... ... A

(b) (b) an accuracy, measured without reference to an external standard, better than 1 part in 50,000 (0.002%) of reading over an ambient temperature range of .2665°C or more, or a stability better than 10u2–u26 of reading over a period of 24 hours or more ... ... A

or

(c) (c) a capability of more than 500 independent measurements per second ... ... A

(13) Transient recorders, utilising analogue-to-digital conversion techniques, capable of storing transients by sequentially sampling single input signals at successive intervals of less than 50 nanoseconds ... ... A

(14) Specially designed software for the equipment in heads (1) to (13) inclusive ... ... A

In this entry–

“user accessible programmability” means that the user has the facility to insert, modify or replace programmes by means other than a physical change in the wiring or interconnections or the setting of function controls including entry of parameters;

"programme" means a sequence of instructions to carry out a process in or convertible into, a form executable by an electronic computer;

"reading speed" does not include changes in range or polarity.

IL1531	Frequency synthesizers (any kind of frequency source or signal generator, regardless of the techniques used, providing a multiplicity of simultaneous or alternative output frequencies, from one or more outputs, controlled by, derived from or disciplined by a lesser number of standard, or master, frequencies) and equipment containing frequency synthesizers, the following–	
	(1) Frequency synthesizers, the following–	
	(a) (a) those containing frequency standards specified in heads (1) or (2) of the entry relating to electronic measuring, calibrating, counting, testing and time interval measuring equipment in this Group	A
	(b) (b) those containing temperature-compensated crystal oscillators specified in head (3) of the entry relating to quartz crystals in this Group	A

(2) Instrument frequency synthesizers and synthesized signal generators, designed for ground use, producing output frequencies whose accuracy and short and long term stability are controlled by, derived from, or disciplined by the input frequency or internal master standard frequency, and having any of the following characteristics:

(a) (a) a maximum synthesized output frequency in excess of 550 MHz	A
(b) (b) any of the following noise characteristics–	
(i) A single sideband (SSB) phase noise better than –120 dBc/Hz when measured at a 20 kHz offset from the carrier frequency;	A
(ii) A single sideband (SSB) phase noise better than –106 dBc/Hz when measured at a 100 Hz offset from the carrier frequency;	A
(iii) An integrated phase noise better than –60 dBc/Hz referred to a 30 kHz band centred on the carrier and excluding the 1 Hz band centred on this carrier; or	A
(iv) An integrated AM phase noise better than –70 dBc/Hz referred to a 30 kHz band centred on the carrier and excluding the 1 Hz band centred on this carrier;	A

except synthsized signal generators that fall under heads (2)(a) or (2)(b)
(i) where the maximum synthesized output

frequency is no more than 1400 MHz or the SSB phase noise is not less than –136 dBc/Hz when measured at an offset of 20 KHz from a carrier frequency of 100 MHz.

(c)	(c) electrically programmable in frequency (in that the output frequency can be controlled or selected by the injection of digitally coded electrical signals from an external control source) with a frequency switching time of less than 10 milliseconds	A
(d)	(d) electrically programmable in phase (in that the phase of the output frequency can be varied relative to the internal or external reference standard, or selected in accordance with an externally supplied code or signal with a speed of switching from one selected phase value to another of less than 10 milliseconds),	A

except those equipments incorporating pre-emphasis networks for frequency modulation.

(e)	(e) having a level of spurious components in the output, measured relative to the selected output frequency, better than	A

		–60 dB harmonic or –92 dB non harmonic;	
	(f)	(f) more than 3 different selected synthesized output frequencies available simultaneously from one or more outputs	A
	(g)	(g) facilities for pulse modulation of the output frequency	A
(3) Airborne communications equipment using frequency synthesizers, the following:			
	(a)	(a) equipment designed to receive or transmit frequencies greater than 156 MHz	A
	(b)	(b) equipment incorporating facilities for the rapid selection more than 200 channels per equipment, except equipments operating in the frequency range of 108 to 136 MHz incorporating facilities for the rapid selection of 720 channels or fewer at not less than 25 kHz channel spacing which have been in normal civil use for at least one year	A
	(c)	(c) equipment with a frequency switching time of less than 10 milliseconds	A
	(d)	(d) frequency synthesizers designed for any of the equipment specified in sub-heads (a) to (c) above (inclusive), whether supplied separately or	A

with such equipment and exceeding the parameters defined for equipment specified in head (2) of this entry ... ...

(4) Digitally-controlled radio receivers, whether or not computer-controlled, which search or scan automatically a part of the electro-magnetic spectrum, using frequency synthesizers, the following–

(a)	(a) digitally-controlled receivers in which the switching operation takes less than 10 milliseconds, except non-ruggedised digitally-controlled pre-set type radio receivers designed for use in civil communications, which have 200 selective channels or fewer	A
(b)	(b) frequency synthesizers designed for the equipment specified in sub-head (a) above, whether supplied separately or with such equipment, and exceeding the parameters defined for equipment specified in head (2) of this entry, except those specially designed for the non-ruggedised receivers specified in sub-head (a) above	A

(5) Radio transmitters incorporating transmitter drive units, exciters and master oscillators using frequency synthesis, the following–

(a)	(a) transmitters having!an output frequency of up to 32 MHz with a frequency resolution of better than 10 Hz and with a frequency switching time of less than 10 milliseconds	A
(b)	(b) transmitters having an output frequency from 32 MHz to 235 MHz with a frequency resolution of better than 250 Hz and with a frequency switching time of less than 10 milliseconds	A
(c)	(c) transmitters having an output frequency greater than 235 MHz	A

except

(i) television broadcasting transmitters having an output frequency from 470 MHz to 960 MHz with a frequency resolution of not better than 1 kHz and where the manually-operated frequency synthesizer incorporated in or driving the transmitter has an output frequency not greater than 120 MHz; and

(ii) FM and AM ground communications equipment for use in the land mobile service and operating in the 420 to 470 MHz band with a power output of 50 W for mobile units and 300 W for fixed units with a frequency resolution of not better than 6.25 kHz and with a frequency

switching time greater than 50 milliseconds;		
(iii) Portable (personal) or mobile radiotelephone for civil use, e.g., for use with commercial civil cellular radiocommunications systems having all of the following characteristics:	A	
(a) Operating in the 420 to 960 MHz range;		
(b) A power output of 10 W or less;*and*		
(c) A "frequency switching time" of 10 ms or more.		
(d) (d) transmitters having more than three different selected synthesized output frequencies available simultaneously from one or more outputs	A	
(e) (e) transmitters with facilities for pulse modulation of the output frequency of the transmitters or of the incorporated frequency synthesizer	A	
(f) (f) frequency synthesizers designed for any of the equipments specified in sub-heads (a) to (e) above (inclusive), whether supplied separately or with such equipment, and exceeding the parameters specified in head (2) of this entry	A	
(6) Specially designed components and accessories for equipment specified in heads (2) to (5) above (inclusive)	A	In this entry frequency switching time means the maximum time (i.e.

delay), when switched from one selected output frequency to another selected output frequency, to reach–

(a) (a) A frequency within 100 Hz of the final frequency; or

(b) (b) An output level within 1.0 dB of the final output level.

IL1532 Precision linear and angular measuring systems, the following–

(1) Contact-type systems and linear voltage differential transformers (LVDT) therefor, the following–

(a) (a) contact-type measuring systems having all the following characteristics– ... ... A

(i) a range equal to or less than 5 mm;

(ii) a linearity equal to or better than .2660.1%; and

(iii) a drift equal to or less than 0.1% per day, at a standard ambient test room temperature .2661 K.

(b) (b) linear voltage differential transformers with no compensation networks and having either of the following characteristics– ... ... A

(i) a range equal to or less than 5 mm; or

(ii) a linearity equal to or better than .2660.2%.

(2) Linear measuring machines, except optical comparators, with two or more A

axes having both the following characteristics– ... ...

(a) (a) a range in any axis greater than 200 mm; and

(b) (b) an accuracy (including any compensation) less (finer) than .266 0.0008 mm per any 300 mm segment of travel.

(3) Angular measuring systems having an "accuracy" equal to or better than .2661 second of arc, except optical instruments using collimated light to detect angular displacements of a mirror ... ... A

(4) Non-contact type measuring systems having either of the following characteristics– ... ... A

(a) (a) an effective probe measurement diameter less than 0.5 mm and a drift less than 0.5% per day, at a standard ambient test room temperature .2661 K; or

(b) (b) a linearity better than 0.3% and a drift of less than 0.5% per day, at a standard ambient test room temperature .2661 K

(5) Contact-type measuring systems specially designed for combined, simultaneous linear-angular inspection of hemishells, having both of the following characteristics– ... ... A

(a) (a) linear accuracy equal to or better than .266 0.005 mm in any 5 mm; and

	(b) (b) angular accuracy equal to or better than .2661 minute in any 90° of arc	
	(6) Specially designed components and specially designed software for equipment specified in heads (1) to (5) above (inclusive)	A
	In this entry– "accuracy" is usually measured in terms of inaccuracy. It is defined as the maximum deviation, positive or negative, of an indicated value from an accepted standard or true value. "linearity" is usually measured in terms of non-linearity. It is defined as the maximum deviation of the actual characteristic (average of upscale and downscale readings), positive or negative, from a straight line so positioned as to equalise and minimise the maximum deviations.	
IL1533	Signal analysers (including spectrum analysers), having any of the following characteristics–	
	(1) Non-programmable and capable of operating at frequencies over 12.5 GHz	A
	(2) Programmable and capable of operating at frequencies over 1.0 GHz	A
	(3) Having a display bandwidth in excess of 125 MHz and capable of operating at frequencies over 2 GHz	A
	(4) Incorporating user accessible programmability and a user alterable programme and	A

a data storage of more than 8,192 bit ... ...

(5) Having either of the following characteristics for analysing frequencies greater than 1 GHz;

(a) (a) including a scanning preselector, or ... ... A

(b) (b) incorporating a tracking signal generator ... ... A

(6) Having an overall display dynamic range of better than 80 dB ... ... A

(7) Employing time compression of the input signal ... ... A

(8) Employing Fast Fourier Transform techniques ... ... A

and specially designed components, accessories and software for the equipment specified in heads (1) to (8) above (inclusive) ... ... A

In this entry Instruments are excepted if their "user accessible programmability" is provided by the "manufacturer" and is limited to–

(a) (a) the replacement of fixed storage devices (eg ROM's)*or*

(b) (b) the selection of preprogrammed functions from a menu.

IL1533 For the purpose of this entry the "manufacturer" is the individual or organisation designing the instrument for the intended application

	(in contrast to an individual or organisation merely programming an instrument at, or in accordance with, a user's request).	
IL1534	Flatbed densitometers, and specially designed components therefor, the following–	
	(1) Flatbed microdensitometers, except cathode-ray types, having any of the following characteristics	A
	(a) (a) a recording or scanning rate exceeding 5,000 data points per second;	
	(b) (b) a "figure of merit" less than 0.1; or	
	(c) (c) an optical density range greater than 0 to 4.	
	(2) Specially designed components for the instruments specified in head (1) above	A
	In this entry "figure of merit" is the product of the density resolution expressed in density units and the spatial resolution expressed in micrometers. Density resolution is measured over the optical density range of the instrument.	
IL1537	Microwave, including millimetric wave, equipment, including parametric amplifiers, capable of operating at frequencies over 1 GHz (other than microwave equipment included in the entries relating to communications, navigation, direction finding and radar equipment; radio transmitters and components; radio relay	

communications equipment; and electronic measuring, calibrating, counting, testing and time interval measuring equipment), the following–

(1) Rigid and flexible waveguides designed for use at frequencies in excess of 18 GHz	A
(2) Waveguides having a bandwidth ratio greater than 1.7:1	A
(3) Waveguide components, the following–	
(a) (a) directional couplers having a bandwidth ratio greater than 1.7:1 and a directivity over the band of 20 dB or more	A
(b) (b) rotary joints capable of transmitting more than one isolated channel or having a bandwidth greater than 5% of the centre mean frequency, except rotary joints used in air traffic control equipment carrying combinations of frequencies suitable for secondary surveillance radar antennae co-mounted on a primary radar antenna and which do not have a bandwidth exceeding 5% of the centre mean frequency	A
(c) (c) magnetic, including gyro-magnetic, waveguide components	A

(d) (d) diode waveguide components, using diodes specified in the entry relating thereto	A
(4) TEM mode devices using magnetic, including gyro-magnetic, properties, or using diodes specified in the entry relating thereto	A
(5) TR and anti-TR tubes and specially designed components therefor, ...	A
except those designed for use in waveguides and having any of the following characteristics, which are in normal use for ground or marine radar–	
(a) (a) operating at a peak power not exceeding 3 MW and at a frequency of 1.5 GHz or less;	
(b) (b) operating at a peak power not exceeding 1.2 MW and at a frequency over the range 1.5 GHz to 6 GHz; and	
(c) (c) operating at a peak power not exceeding 300 kW and at a frequency over the range 6 GHz to 10.5 GHz.	
(6) Assemblies and sub-assemblies in which the isolating base material functions as a dielectric (as used in stripline, microstrip or slotline), except those specifically designed for use in civil television systems to meet ITU standards and using, as an isolation material, paper base phenolics, glass	A

cloth melamine, glass cloth epoxy resin, polyethylene terephthalate or any other isolating material capable of withstanding an operating temperature not exceeding 150°C ... ...

(7) Phased array antennae and sub-assemblies, designed to permit electronic control of beam shaping and pointing, and specially designed components therefor (including but not limited to duplexers, phase shifters and associated high-speed diode switches) ... ... A

except duplexers and phase shifters specifically designed for use in civil television systems or in other civil radar or communication systems not specified in Group 3F.

(8) Other antennae specially designed for operation at frequencies above 30 GHz having a diameter of less than 1 metre, and specially designed components therefor ... ... A

(9) Microwave assemblies or sub-assemblies having circuits fabricated by the same processes as used in integrated circuit technology, that include active circuit elements (see also the entries relating to acoustic wave devices in Group 3G; and electronic components, assemblies, sub-assemblies, and printed circuit boards and microcircuits in this Group) ... ... A

(10) Microwave assemblies or sub-assemblies which contain band pass or band stop filters and which are capable of operating at 3 GHz or greater A

except microwave assemblies, subassembliesc or amplifiers (or combinations thereof) having all of the following characteristics–

(a) (a) Fixed tube at the time of manufacture to operate only within the ITU satellite broadcasting band from 11.7 to 12.5 GHz;

(b) (b) Not capable of being retuned to a new frequency band by the user;*and*

(c) (c) Specially designed for use with, or in, civil television receivers.

(11) Amplifiers (see also the entry relating to solid-state broadband amplifiers in this Group) ... ... A

except microwave assemblies, sub-assemblies or amplifiers (or combinations thereof) having all of the following characteristics–

(a) (a) Fixed tuned at the time of manufacture to operate only within the ITU satellite broadcasting band from 11.7 to 12.5 GHz;

(b) (b) Not capable of being retuned to a new frequency band by the user;*and*

(c) (c) Specially designed for use with, or in, civil television receivers.

	(12) PIN Modulators (see also the entry relating to semi-conductor diodes in this Group)	A
	In this entry "ITU Standards" means the standards for civil television systems designed to International Telecommunication Union recommendations.	
IL1541	Cathode-ray tubes having any of the following characteristics–	
	(1) a resolving power of 32 lines or more per mm using the shrinking raster method of measurement	A
	(2) with travelling wave, or distributed deflection structure, using delay lines or incorporating other techniques to minimise mismatch of fast phenomena signals to the deflection structure; or	A
	(3) incorporating microchannel plate electron multipliers	A
	except	
	cathode-ray tubes, having all of the following characteristics–	
	(a) (a) microchannel-plate electron multipliers with a hole pitch of 25 micro-metres or more;	
	(a) (a) tubes not ruggedised for military use;	
	(c) (c) tubes having a horizontal sweep slower than 200 ns/cm; and	

	(d) (d) the electron gun mounted parallel to the screen surface.	
IL1542	Cold cathode tubes, including Krytrons, whether gas-filled or not, operating in a manner similar to a spark gap, containing three or more electrodes and having all of the following characteristics–	A
	(1) rated for an anode peak voltage of 2,500 V or more;	
	(2) rated for peak currents of 100 A or more;	
	(3) an anode delay time of 10 microseconds or less; and	
	(4) an envelope diameter of less than 25.4 mm.	
IL1543	Triggered spark gaps having an anode delay time of 15 microseconds or less and rated for a peak current of 3,000 A or more, and components specially designed therefor and equipment incorporating such devices	A
IL1544	Semiconductor diodes and dice and wafers therefor (except those specified elsewhere in this Schedule, or those made from germanium, selenium or copper oxide), having any of the following characteristics–	
	(1) Semiconductor diodes designed or rated for use at input or output frequencies above 12.5 GHz	A
	(2) Mixer and detector diodes designed or rated for use at input or output frequencies greater than 3 GHz	A
	except	
	(a) (a) point contact diodes designed or rated for use at input or output frequencies of 12.5 GHz or less;	

(b) (b) Schottky diodes designed or rated for mixer use at input or output frequencies of less than 12.5 GHz and having a noise figure of more than 6.5 dB;

(c) (c) Schottky diodes designed or rated for detector use at input or output frequencies of less than 12.5 GHz and having a minimum rated tangential sensitivity of worse than –45 dBm under unbiased conditions or worse than –50 dBm under biased conditions;

(3) Oscillator and amplifier devices such as Gunn, Impatt, Trapatt, TED and LSA, including those used for the direct conversion of DC to RF power, designed or rated for use at–

(a) (a) output frequencies above 1 GHz, but not exceeding 4 GHz, with a peak power greater than 2 W or a maximum CW power greater than 200 mW, or ... ... A

(b) (b) output frequencies above 4 GHz, but not exceeding 12.5 GHz, with a peak power greater than 1 W or a maximum CW power greater than 100 mW ... ... A

(4) Voltage variable capacitance diodes designed or rated for use at input or output A

	frequencies greater than 1.7 GHz	
	(5) Fast recovery diodes having either of the following characteristics–	
	(a) (a) a rated maximum reverse recovery time of less than 1 nanosecond or rated for a stored charge of less than 25 pico-coulombs, or	A
	(b) (b) both a rated forward rectified current over 5 amperes and a rated maximum reverse recovery time of less than 20 nanoseconds or a rated storage charge of less than 25 pico-coulombs	A
	(6) PIN diodes designed or rated for use at input or output frequencies above 1.7 GHz, with a peak power of more than 5 W or a maximum CW power of more than 500 mW	A
	(7) Non-coherent light-emitting diodes with a peak radiant intensity at a wavelength of greater than 1,000 nanometres	A
	(8) Dice and wafers for the semiconductor diodes specified in heads (1) to (7) above (inclusive)	A
IL1545	Transistors and dice and wafers therefor (except photo-transistors which are specified in the entry in this Group relating to photosensitive components), the following–	
	(1) Transistors using a bulk semiconductor material other than germanium, silicon or gallium arsenide	A

(2) Transistors using silicon as the bulk semiconductor material, the following–

(a)	(a) types having an operating frequency greater than 1.5 GHz	A
(b)	(b) types having an operating frequency of 1.5 MHz or less, and a maximum collector dissipation exceeding 300 W	A
(c)	(c) types having an operating frequency greater than 1.5 MHz and a maximum collector dissipation exceeding 250 W	A
(d)	(d) types having an operating frequency greater than 200 MHz and a product of the operating frequency (in GHz) and the maximum collector dissipation (in W) exceeding 10	A
(e)	(e) majority carrier-type transistors, including but not limited to junction field-effect transistors (FETs) and metal-oxide semiconductor transistors (MOS),*except* field-effect transistors having–	
(i)	A maximum power dissipation of no more than 6 W and an operating frequency not exceeding 1.0 GHz; or	A

(ii)	A maximum power dissipation of no more than 1 W and an operating frequency not exceeding 2.0 GHz	A
	(f) (f) Transistors based upon gallium arsenide and having any of the following characteristics–	
(1)	An operating frequency exceeding 1 GHz	A
(2)	A maximum power dissipation of more than 1 W; or	A
(3)	A noise figure of less than 3 dB	A

In this entry "maximum collector dissipation" means the continuous dissipation measured under the optimum cooling conditions specified by the manufacturer;

"maximum operating frequency" in Hertz means f max = gm2 Ci where gm is the maximum transconductance in Siemens (mho) and Ci is the input capacitance in farads; and

"operating frequency" means the frequency used in measuring output power or power gain (Gpd2E, Gpd2B or Gpd2C). When these parameters are not specified, "operating frequency" means the frequency used in measuring gain bandwidth product "(fd2T)" or noise figure.

IL1547	Thyristors and dice and wafers therefor, the following–	
	(1) Thyristors designed for use in pulse modulators having a rated turn-on time of less than 1 microsecond where the rated peak current exceeds 150 A	A
	(2) Thyristors having a rated turn-off time of less than 1 microsecond	A
	(3) Thyristors having a rated turn-off time of 1 microsecond or more but less than 2.3 microseconds, except those having a rated peak current of 50 A or less and encapsulated in non-hermetically sealed packages	A
	(4) Thyristors having a rated turn-off time of from 2.3 microseconds to 10 microseconds (inclusive) and a figure of merit greater than 100	A
	In this entry “figure of merit” is defined as the product of the repetitive peak off-state voltage (V DRM) in kV and the repetitive peak on-state current (I TRM) in A as shown on the thyristor data sheets.	
	In this entry the “turn-off time” for gate-turn-off thyristors is defined as the sum of the gate controlled delay time Td2Dd2Q and the gate controlled fall time Tfq to reach 10% of the initial on-state current.	
IL1548	Photosensitive components, including linear and focal plane arrays, the following–	
	(1) Photosensitive components (including photodiodes, phototransistors, photothyristors,	

photoconductive cells and similar photosensitive components) having either of the following characteristics–

(a) (a) a peak sensitivity at a wavelength longer than 1,200 nanometres or shorter than 190 nanometres; or ... ... A

(b) (b) a peak sensitivity at a wavelength shorter than 300 nanometres and an efficiency of less than 0.1% relative to peak response at wavelengths longer than 400 nanometres A

except vacuum photodiodes specially designed for use in spectrophotometry having a peak response at a wavelength shorter than 300 nanometres.

(2) Semi-conductor photodiodes and phototransistors with a response time constant of 95 nanoseconds or less measured at the operating temperature for which the time constant reaches a minimum ... ... A

(3) Components specially designed or rated as electromagnetic (including laser) and ionised-particle radiation resistant ... ... A

(4) Linear and focal plane arrays (hybrid or monolithic) having any of the characteristics specified in heads (1) or (2) above, and specially designed components therefor ... ... A

(5) Dice and wafers for the components specified in heads (1) to (4) above (inclusive) A

except

(a) (a) Germanium photo devices with a peak sensitivity at a wavelength shorter than 1,750 nanometres;

(b) (b) Infrared single-element encapsulated photoconductive cells or pyroelectric detectors intended for civil applications and using any of the following–

(i) Evaporated lead sulphide;

(ii) Triglycine sulphate with a surface area of 20 mm or less;

(iii) Lead-lanthanum-zirconium titanate ceramic.

(c) (c) Single-element encapsulated mercury-cadmium-telluride (HgCdTe) uncooled (295 K ambient temperature operation) photo-electromagnetic (pem) or photoconductive (pc) mode photo detectors with a peak sensitivity at a wavelength shorter than 11,000 nanometres.

In this entry “time constant” means the time taken from the application of a light stimulus for the current increment to reach a

	value of 1–1/e times the final value (63% of the final value).	
IL1549	Photomultiplier tubes, the following–	
	(1) Those for which the maximum sensitivity occurs at wavelengths shorter than 300 nanometres	A
	(2) Those having an anode pulse rise time of less than 1 nanosecond	A
	(3) Those containing microchannel plate electron multipliers	A
except photomultiplier tubes specially designed for use in spectrophotometry having a peak sensitivity at a wavelength shorter than 300 nanometres.		
IL1553	X-Ray systems, flash discharge type, including tubes, having all of the following characteristics–	A
	(1) Peak power greater than 500 MW;	
	(2) Output voltage greater than 500 kV; and	
	(3) Pulse width less than 0.2 microsecond.	
IL1555	Electron tubes except commercial standard television/video camera tubes not having fibre optic faceplates, and commercial standard X-ray amplifier tubes, the following–	
	(1) those for image conversion or intensification incorporating any of the following–	
	(a) (a) fibre-optic face-plates specified in head (1) of the entry in this Group	A

	relating to optical elements;	
	(b) (b) microchannel plate electron multipliers; or	A
	(c) (c) gallium arsenide or other epitaxially grown semi-conductor photocathodes specified in head (3) of the entry in this Group relating to optical elements.	A
	(2) those for television/ video cameras having any of the following characteristics–	
	(a) (a) incorporating fibre-optic face-plates specified in head (1) of the entry in this Group relating to optical elements;	A
	(b) (b) incorporating microchannel plate electron multipliers; or	A
	(c) (c) coupled with electronic tubes specified in sub-head (1) of this entry	A
	(3) Ruggedised electron tubes for television/video cameras having a maximum length-to-bulb diameter ratio of 5:1 or less	A
	(4) specially designed components for the electron tubes specified in heads (1) to (3) above (inclusive)	A
IL1556	Optical elements and elements for optical tubes, the following–	
	(1) Non-flexible fused fibre optic plates or bundles, having a fibre pitch (centre to centre spacing) of less than 10 micrometres; a light-absorbing	A

	medium surrounding each fibre or interstitially placed between fibres; and a diameter greater than 13 mm	
	(2) Microchannel plates for electron image amplification, having 15,000 or more hollow tubes per plate; and a hole pitch (centre to centre spacing) of less than 25 micrometres	A
	(3) Semi-transparent photocathodes incorporating epitaxially grown layers of compound semi-conductors, such as gallium arsenide	A
	(4) Diffractive type optical elements specially designed for display screens, having any of the following characteristics–	
	(a) (a) a transmission of more than 90% outside the reflection band and a reflection of more than 75% inside the reflection band, which has less than 15 nanometres bandwidth and is matched to the frequency of the display light source;	A
	(b) (b) a rear projection screen brightness gain of more than 10 times the gain of a Lambertian scatterer with an equivalent area, and less than 10% variation in brightness across the exit aperture; or	A
	(c) (c) specially designed for use in helmet-mounted displays	A
IL1558	Valves and cathodes, the following–	

(1) Valves in which space charge control is utilised as the primary functional parameter, the following–

(a) (a) valves rated for continuous wave operation above 4 GHz at the maximum rated anode dissipation A

(b) (b) valves rated for continuous wave operation within the frequency range 0.3 GHz to 4 GHz and for which (under any condition of cooling) the product of the maximum rated anode dissipation (expressed in W) and the square of the maximum frequency (expressed in GHz) at the maximum rate anode dissipation is greater than 10u24

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except

valves specially designed for television transmitters operating in the frequency range 0.47 GHz to 0.96 GHz and rated for operation without a grid current, for which the product of the rated anode dissipation (expressed in W) and the square of the maximum frequency (expressed in GHz) is not greater than 2 × 10u24;

(c) (c) valves rated only for pulse operation above 1 GHz, with maximum peak pulse output power greater than 45 kW ... ... A

(d) (d) valves rated only for pulse operation between 0.3 and 1 GHz and for which (under any condition of cooling), the product of the peak pulse output power (expressed in W) and the square of the maximum frequency (expressed in GHz) is greater than 4.5 × 10u24	A
(e) (e) valves, specially designed for use as pulse modulators for radar or similar applications, the following–	
(i) having a peak anode voltage rating of 100 kV or more	A
(ii) rated for a peak pulse power of 20 MW or more	A
(see also the entry in this Group relating to pulse modulators);	
(2) Valves which utilise interaction between a beam of electrons and microwave elements and in which the electrons travel in a direction perpendicular to the applied magenetic field, including but not limited to magnetrons, crossed-field amplifier valves and crossed-field oscillator valves	A
except	
(a) (a) fixed frequency and tunable pulsed magnetrons and crossed-field amplifier valves, the following–	

(i) magnetrons designed to operate at frequencies below 3 GHz with a maximum rated peak output power of 5 MW or less;

(ii) magnetrons designed to operate at frequencies of between 3 GHz and 12 GHz if the product of the maximum rated peak output power (expressed in kW) and the frequency (expressed in GHz) is less than 4,200 and the "frequency tuning time" is more than 100 milliseconds; and

(iii) crossed-field amplifier valves designed to operate at frequencies below 4 GHz with a maximum rated peak output power of 1.2 MW or less and a gain of less than 15dB;

In this entry "frequency tuning time" is the time required to change the operating frequency from a starting frequency, through the maximum frequency, through the minimum frequency, and return to the starting frequency, ie one complete tuning cycle.

(b) (b) fixed frequency continuous wave magnetrons designed for medical, industrial heating or cooking purposes, operating at a frequency of 2.375 GHz .266 0.05 GHz, or 2.45 GHz .266 0.05 GHz with a maximum rated output power not exceeding 6 kW, or at a frequency lower than 1 GHz with a maximum rated power output not exceeding 25 kW;

(3) Valves which utilise the interaction between a beam of electrons and microwave elements or cavities and in which the electrons travel in a direction parallel to the applied magnetic field, including but not limited to klystrons and travelling wave tubes, ... A

except

(a) (a) continuous wave valves designed for half an octave or lesser bandwidth (where the highest operating frequency is equal to or less than 1.5 times the lowest operating frequency) and having all the following characteristics–

(i) designed to operate below 20 GHz;

(ii) the product of the rated output power (expressed in W) and the frequency (expressed in GHz) is less than 300;

(iii) no multiple grid electron guns; and

(iv) collectors with no more than two depressed stages;

(b) (b) pulsed valves designed for half an octave or lesser bandwidth having collectors with no more than two depressed stages and having either of the following characteristics–

(i) peak saturated output power not exceeding 1 kW and average power not exceeding 40 W at or below 10 GHz; or

(ii) peak saturated output power not exceeding 100 W and average power not exceeding 20 W at frequencies between 10 and 20 GHz;

(c) (c) pulsed valves designed for fixed frequency operation at frequencies less than 3.5 GHz, having a peak output power of 1.6 MW or less and an operating bandwidth less than one per cent; and

(d) (d) valves used as fixed-frequency or voltage-tunable oscillator valves designed to operate at frequencies below 20 GHz with a maximum output power of less than 3W;

(4) Valves which utilise interaction between an electron beam and microwave elements or cavities but do not require a magnetic field to control or focus the electron beam, except low power reflex oscillator klystrons designed to operate at frequencies below 20 GHz and at a maximum output power of less than 3 W ... ... A

(5) Valves which utilise interaction between a beam of electrons and microwave elements or cavities in which the electrons drift in a direction parallel to the applied magnetic field but also require for their operation a large component A

	of velocity transverse to the direction of the applied magnetic field, including but not limited to gyrotrons, ubitrons and peniotrons	
	(6) Valves designed to withstand on any axis an acceleration of short duration (shock) greater than 1,000 g	A
	(7) Valves designed for operation in ambient temperatures exceeding 200°C	A
	(8) Valves specified in sub-heads (3), (4) or (5) above which are designed to operate with no filament or cathode heating element	A
	(9) Valves which use a modulated beam of electrons striking one more semiconductor diodes to provide power gain (see also the entry in this Group relating to semiconductor diodes)	A
	(10) Cathodes for electronic vacuum tubes, the following–	
	(a) (a) specially designed for tubes specified in sub-heads (1) to (9) above; or	A
	(b) (b) impregnated cathodes capable of producing a current density exceeding 0.5 A/cmu22 at rated operating conditions	A
	(11) specially designed components for the valves specified in this entry	A
	except valves specified in heads (1) and (3) above, specially designed for civil telecasting according to CCIR or OIR standards.	
IL1559	Hydrogen/hydrogen isotope thyratrons of ceramic metal	

	construction, and accessories therefor, having any of the following characteristics–	
	(1) a peak pulse power output of 20 MW or more	A
	(2) a peak anode voltage of more than 25 kV or	A
	(3) a peak current rating of more than 1.5 kA	A
	Note: for thyratrons rated for both single shot (crowbar) and modulator service, the figure for modulator service should be used.	
IL1560	Capacitors designed for or capable of maintaining their rated electrical or mechanical characteristics during their specified operating lifetime, the following–	
	(1) Monolithic ceramic capacitors (other than boundary layered capacitors) using non-ferro-electric strontium titanate (SrTiOd23) dielectric rated for operation over the whole range of ambient temperatures from below –55°C to above + 85°C	A
	(2) Other capacitors rated for operation at ambient temperatures below –55°C or above + 200°C	A
	See also the entry in Group 4 relating to technology for the design and production of tantalum capacitors.	
IL1561	Materials specially designed and manufactured for use as absorbers of electromagnetic waves having frequencies greater than 2 × 10u28 Hz, and less than 3 × 10u21u22 Hz	A
	except the following–	
	(1) Hair type absorbers, whether constructed of natural or synthetic fibres, with non-	

magnetic loading to provide absorption;

(2) Absorbers whose incident surface is non-planar in shape, including pyramids, cones, wedges and convoluted surfaces, and which have no magnetic loss; and

(3) Absorbers whose incident surface is planar and which are either plastic foam materials (flexible or non-flexible) with carbon loading to provide absorption, or organic binders with magnetic material loading which provide resonant absorption performance, being absorbers or binders having both of the following characteristics–

(a) (a) a tensile strength of less than 7 × 10u26 N/mu22 (1,016 psi) and a compressive strength of less than 14 × 10u26 N/mu22 (2,032 psi); and

(b) (b) not capable of withstanding temperatures higher than 176°C.

In this entry, "resonant absorption performance" is defined as less than 5% echo compared with metal over a bandwidth of not more than .26615% of the centre frequency of the incident energy.

IL1564 Electronic component assemblies, modules, printed circuit boards with mounted components, substrates and integrated circuits, including packages therefor, the following–

(1) Substrates for printed circuit boards including ceramic substrates and coated metal substrates (single-sided, double-sided or multilayer), and thin copper foils therefor A

except:

(a) (a) printed circuit boards manufactured from any of the following materials:

(i) paper base phenolics;

(ii) glass cloth melamine;

(iii) glass epoxy resin uncoated or coated with copper foil of a thickness of 18 micrometres (0.00071 inch) or greater;

(iv) polyethylene terephthalate;

(v) any other insulating material having all of the following characteristics–

(a) a maximum continuous rated operating temperature not exceeding 423 K (150°C);

(b) a dissipation factor equal to or greater than 0.009 at 1 MHz

(c) a relative dielectric constant equal to or less than 8 at 1 MHz; and

(d) a coefficient of expansion equal to or greater than .26610u2–u25 K over a temperature range of 273 K to 393 K (0 to 120°C);

(b) (b) ceramic substrates having not more than two layers of interconnections, including the ground plane;

(c) (c) copper foil having a thickness of 18 micrometres (0.00071 inch) or greater.

(2) Ceramic packages for integrated circuits which are designed for hermetically sealed pin or pad grid array, leadless carrier or surface-mounted configurations ... ... A

except those having all of the following characteristics–

(a) (a) single-in-line, dual-in-line or flat-pack configuration;

(b) (b) pin, pad or lead spacings of 2.5 mm or more or 100 mils or more; and

(c) (c) 40 leads or less.

(3) Assemblies, modules and printed circuit boards with mounted components, the following:

(a) (a) those containing substrates for printed circuit boards specified in head (1) above ... ... A

(b) (b) those containing microprocessor, micro-computer or memory microcircuits or other components specified elsewhere in this Group, ... A

except

(i) assemblies incorporating components specified in this Group but which components are capacitors;

(ii) power supply assemblies;

(iii) assemblies, modules and printed circuit boards with mounted components designed for equipment not otherwise specified in this Schedule and which, by nature of their design, performance, lack of user accessible programmability, lack of user-accessible microprogrammability, software, microprogramme control or specialised logic control, are substantially restricted to the particular application for which they have been designed.

For assemblies, modules or printed circuit boards with mounted components which are designed for, or which have the same functional characteristics as electronic computers or related equipment, see IL 1565.

Assemblies, modules or printed circuit boards with mounted components which are designed for, or have the same functional characteristics as, equipment specified in this schedule shall be rated against the parameters of appropriate equipment items. In such cases, however, the relevant temperature parameters have to be changed into below 218 K (–55°C) or above 358 K (85°C).

(4) Microcircuits (monolithic integrated circuits, microprocessor, microcomputer, multichip, hybrid, film or integrated optical types), ... A

except

(a) (a) encapsulated passive networks;

(b) (b) encapsulated integrated circuits (other than those designed or rated as radiation hardened and other than those rated for operation below –40°C or above +85°C) packaged in TO–5 outline cases (7.7 to 9.4 mm diameter) or in non-hermetically sealed cases, the following–

(i) bipolar monolithic integrated circuits having all the following characteristics–

(a) encapsulated in a package having 24 terminals or less;

(b) a basic gate propagation delay time not less than 3 nanoseconds;

(c) designed to perform a single digital logic function or a combination of digital logic functions;

(d) a basic gate power dissipation of no less than 2m W;

(e) a product of the basic gate propagation delay time and the basic gate power dissipation per gate of no less than 30 pJ for types having a basic gate propagation delay time of 3 nanoseconds or more and less than 5 nanoseconds.

(ii) bipolar monlithic integrated circuits, the following:

switches, electronic, externally controlled by inductive, optical or magnetic means, including threshold value switches, with switching times of 0.5 microsecond or more, designed for civil applications.

(iii) complementary metal-oxide semi-conductor (CMOS) monolithic integrated circuits designed for operation as digital logic circuit elements, the following–

gates, inverters, buffers, flip-flops, latches, multivibrators, bilateral switches, display drivers, fixed counters, fixed frequency dividers, storage registers, decoders, voltage translators, encoders, Schmidt-triggers, delay timers, carry generators or clock generators, or any combination of the above digital logic functions, having both of the following characteristics–

(a) encapsulated in a package having 24 terminals or less;

(b) a minimum value of the basic gate propagation delay time under any rated conditions of not less than 10 nanoseconds;

(iv) Positive-channel type or negative-channel type metal oxide semiconductor (PMOS or NMOS) having all of the following characteristics–

(a) specially designed for use as serial digital shift registers;

(b) a maximum clock rate of 10 MHz; and

(c) a maximum number of bit per package of 1024.

(v) silicon microcomputer microcircuits other than bit-slice microcomputer microcircuits, having all of the following characteristics–

(a) a word size to speed ratio of less than or equal to 1.1 bit per microsecond;

(b) a speed-power dissipation product of greater than or equal to 1.2 microjoules;

(c) an on-chip read-only storage (ROM), not including the microprogramme of less than or equal to 4,096 byte;

(d) an on-chip random-access memory (RAM) of less than or equal to 128 byte;

(e) containing no programmable read-only storage (PROM);

(f) an operand (data) word length of less than or equal to 8 bit;

(g) not capable of using off-chip storage for programme storage;

(h) not containing multiplication capabilities, general purpose operating systems or high order languages;

(i) not rated for operation below 253 K (–20°C) or above 348 K (+75°C); and

(j) mask programmed by the manufacturer for a civil application;

(vi) silicon microprocessor microcircuits, other than bit-slice microprocessors, having all of the following characteristics–

(a) a word size to speed ratio of less than or equal to 1.25 bit per microsecond;

(b) a speed-power dissipation product of greater than or equal to 2 microjoules;

(c) containing no on-chip ROM or PROM;

(d) containing on-chip RAM of less than or equal to 1,024 bit;

(e) capable of addressing off-chip memory not greater than 65,536 byte;

(f) an operand (data) word length of less than or equal to 8 bit and not having an arithmetic logic unit (ALU) wider than 8 bit;

(g) not containing multiplication instructions; and

(h) not rated for operation below 253 K (–20°C) or above 348 K (75°C);

In sub-heads (b) (v) and (b) (vi) "speed" in each case means the time to fetch an operand C and another operand D, both from an external storage outside any work register, add these operands and put the result back in storage; and

"speed-power dissipation product" in each case means the product of the speed and the typical value of the power dissipation, at the clock frequency used in the speed calculation;

(vii) storage monolithic integrated circuits or multichip integrated circuits, the following–

(a) Read-only (ROMs), having all of the following characteristics–
(i)Mask programmed by the manufacturer for a civil application prior to shipment;(ii)A maximum of 8,192 bit per package;(iii)A maximum access time of not less than 450 nanoseconds;
(iv)Not rated for operation at an ambient temperature below 253 K (–20°C) or above 348 K (75°C);

(b) Positive-channel type or negative-channel type metal-oxide semiconductor

read-only (PMOS – or NMOS-ROMs), having all of the following characteristics–
(i)Mask programmed by the manufacturer for a civil application prior to shipment;(ii)A maximum of 32,768 bit per package;(iii)A maximum access time of not less than 450 nanoseconds;(iv)Not rated for operation at an ambient temperature below 253 K (–20°C) or above 348 K (75°C);

(c) Positive-channel type or negative-channel type metal-oxide semiconductor read-only (PMOS – or NMOS-ROMs), having all of the following characteristics–
(i)Mask programmed or designed as character generators for a standard character font;(ii)A maximum access time of not less than 250 nanoseconds;(iii)Not rated for operation at an ambient temperature below 253 K (–20°C) or above 348 K (75°C);

(d) Programmable (non-erasable) read-only (PROMs) having all of the following characteristics–
(i)Programmed by the manufacturer for a civil application prior to shipment;(ii)A

maximum of 2,048 bit per package;(iii)A maximum access time of not less than 250 nanoseconds;(iv)Not rated for operation at an ambient temperature below 253 K (–20°C) or above 348 K (75°C);

(e) Programmable (non-erasable) read-only (PROMs) having all of the following characteristics–(i)Programmed by the manufacturer for a civil application prior to shipment;(ii)A maximum of 8,192 bit per package;(iii)A maximum access time of not less than 450 nanoseconds;(iv)Not rated for operation at an ambient temperature below 253 K (–20°C) or above 348 K (75°C);

(f) Bipolar random-access (RAMs), having any of the following pairs of characteristics–(i)A maximum of 64 bit per package and a maximum access time of not less than 30 nanoseconds;(ii)A maximum of 256 bit per package and a maximum access time of not less than 40 nanoseconds;(iii)A maximum of 1,024 bit per package and a maximum access time of not less than 45 nanoseconds;

(g) Metal-oxide semiconductor dynamic random access (MOS-DRAMs), having all of the following characteristics:(i)A maximum of 4,096 bit per package;(ii)A maximum access time of not less than 250 nanoseconds;(iii)Not rated for operation at an ambient temperature below 253 K (–20°C) or above 348 K (75°C);

(h) Metal-oxide semiconductor static randon access (MOS-SRAMs), having both of the following characteristics–(i)A maximum of 1,024 bit per package;(ii)A maximum access time of not less than 450 nanoseconds;

(viii) monolithic or hybrid integrated circuits, the following–

(a) non-reprogrammable circuits, not capable of addressing external memory, specially designed for, and which by virtue of circuit design are normally limited to use in simple calculators which perform a single function in response to a keystroke, and are capable of performing a floating point addition of 13 decimal digits (mantissa only) or less in not less than 20 milliseconds:

(b) non programmable circuits specially designed for, and which by virtue of circuit design are normally limited to use only in simple key programmable calculators having both the following characteristics–(i)capable of executing a sequence of not more than 256 programme steps introduced into a programme memory on the chip by a sequence of keystrokes; and(ii)capable of performing a floating point addition of 13 decimal digits (mantissa only) or less in not less than 20 milliseconds;

(ix) Peripheral positive–channel type or negative–channel type metal-oxide semiconductor (PMOS or NMOS) monolithic integrated circuits or multichip integrated circuits, designed only for:

(a) the support of microprocessor microcircuits which are specified in subhead 4(b)(v) above

and

(b) any of the following functions:(i)Parallel input/output controller (PIO)(ii)Serial input/output controller (SIO)(iii)Dual asynchronous receiver/transmitter

(DART)(iv)Counter-timer circuit (CTC)

(x) amplifier integrated circuits the following–

(a) untuned AC amplifier circuits having a bandwidth of less than 3 MHz and a maximum rated power dissipation of 5 W or less at an ambient temperature of 298 K (25°C);

(b) audio amplifier microcircuits having a maximum rated continuous power output of 50 W or less at an ambient temperature of 298 K (25°C);

(c) operational amplifier microcircuits having all of the following characteristics–

(i)
a typical unity-gain open loop bandwidth of not more than 5 MHz;

(ii)
a typical open-loop voltage gain of not more than 10u26, i.e. 120 dB;

(iii)
either a maximum intrinsic rated input offset voltage of not less than 1 mV, or a maximum input offset voltage drift of not less than 5 microvolts per K (°C);

(iv)
a typical slew rate at unity gain not exceeding 6 V/microsecond provided that, for microcircuits having a typical

slew rate, at unity gain, greater than 2.5 microvolts/second, the typical power dissipation is greater than 10 milliwatts per amplifier;

(v)
isolation amplifier microcircuits;

(vi)
instrumentation amplifier microcircuits having all of the following characteristics–

(a)
a best case rated linearity of not better than .266 0.01% at a gain of 100;

(b)
a maximum gain-bandwidth product not greater than 7.5 (expressed in MHz) and

(c)
a typical slew rate at unity gain not exceeding 3 V/microsecond;

(xi) analogue multiplier or divider integrated circuits having both the following charactersistics–

(a) a best case rated non-linearity of not better than .266 0.5% of full scale; and

(b) a –3 dB small-signal bandwidth of not more than 1 MHz;

(xii) voltage integrated circuits, whether or not rated for operation above + 85°C, the following–

(a) voltage reference circuits having both of the following characteristics–

(i) a rated accuracy of no better than .266 0.1%; and

(ii) a temperature coefficient of voltage not less than 15 x 10u2–u26/K or

(b) voltage comparator microcircuits having both the following characteristics–

(i) a maximum input offset voltage of not less than 2 mV; and

(ii) a typical switching speed of not less than 30 nanoseconds;

(c) linear type voltage regulators having both the following characteristics–

(i) a rated nominal output voltage of 50 V or less; and

(ii) a maximum output current of 2 A or less;

(d) switching type voltage regulators having both the following characteristics–

(i) a rated nominal output voltage of 40 V or less; and

(ii) a maximum output current of 150 mA or less;

(xiii) bipolar microcircuits designed for operation in civil applications as externally controlled (by inductive, magnetic or optical means) electronic switches or as threshold value switches with switching times of 0.5 microsecond or greater;

(xiv) non-coherent light-emitting alphanumeric displays not incorporating a monolithic integrated circuit;

(xv) non-coherent light-emitting alphanumeric displays incorporating a monolithic integrated circuit used for decoding, controlling and/or driving that display, provided that the integrated circuit is not integral with the actual display device;

(xvi) simple encapsulated photo-coupler (transopter) circuits with electrical input and output and which incorporate non-coherent light-emitting diodes;

(xvii) interface integrated circuits, the following–

(a) line drivers and line receivers, having a typical propagation delay time from data input to output of not less than 15 nanoseconds;

(b) peripheral and display drivers having all of the following characteristics–

(i) a maximum rated output current of 500 mA or less;

(ii) a typical propagation delay time from data input to output of

not less than 20 nanoseconds; and
(iii)
a maximum rated output voltage of 80 V or less;

(c) sense amplifiers having both the following characteristics–
(i)
a typical propagation delay time from data input to output of not less than 15 nanoseconds; and
(ii)
a typical input threshold voltage of not less than 10 mV;

(d) storage or clock drivers having all of the following characteristics–
(i)
a maximum rated output current of 500 mA or less;
(ii)
a maximum rated output voltage of 30 V or less; and
(iii)
a typical propagation delay time from data input to output of not less than 20 nanoseconds;

(xviii) voltage-to-frequency converter circuits not employing delta or delta/sigma modulation techniques, having both the following characteristics–

(a) a rated accuracy of not better than .266 0.01% of full scale;

(b) a gain drift not less than .266 50 x

10u2–u26/K at rated frequency;

(xix) Rms-to-dc voltage converter circuits;

(xx) analogue-to-digital and digital-to-analogue converter integrated circuits (other than coder, decoder or coder/decoder (codec) microcircuits specially designed for voice), the following–

(a) analogue-to-digital converter circuits having both the following characteristics–(i)a maximum conversion rate to rated accuracy of no more than 50,00 complete conversions per second, ie a conversion time to maximum resolution of no less than 20 microseconds; and(ii)an accuracy of not better than 0.025% of full scale over the specified operating temperature range;

(b) digital-to-analogue converter circuits having both the following characteristics–
(i)
a maximum settling time to rated linearity of not less than 5 microseconds for "voltage output" and not less than 250 nanoseconds for current output converters; and
(ii)
a non-linearity of not better than .266 0.025% of full scale over the specified

operating temperature range;

(c) analogue-to-digital converters microcircuits specially designed for digital voltmeter applications and permitting characteristics corresponding to those of instruments not specified in head (12) of the entry in this group relating to electronic measuring equipment.

(xxi) Silicon monolithic integrated circuits, microcomputer microcircuits, microprocessor microcircuits, multichip integrated circuits, film type integrated circuits, hybrid integrated circuits or optical integrated circuits having all of the following characteristics–

(a) no user-accessible microprogrammability;*and*

(b) designed or programmed by the manufacturer for any of the following applications only–
(i)
car electronics (eg entertainment, instrumentation, safety, comfort, operations or pollution);
(ii)
home electronics (eg audio and video equipment), appliances, safety, education, comfort, remote controlled toys or amusement;

(iii) timekeeping applications (eg watches or clocks);

(iv) personal communications up to 150 MHz, including amateur radio communication and intercom;

(v) cameras including cine cameras but excluding imaging micro-circuits;*or*

(vi) medical electronic prostheses (eg cardiac pacemakers, hearing aids);

(xxii) timing integrated circuits having both of the following characteristics–

(a) a typical timing error of not less than .266 0.5%; and

(b) a typical rise time of not less than 100 nanoseconds;

(xxiii) sample and hold integrated circuits having both of the following characteristics–

(a) an acquisition time of not less than 10 microseconds; and

(b) a maximum non-linearity error equal to or not worse than .266 0.01% of full scale for a hold time of 1 microsecond;

(5) Unencapsulated silicon based integrated circuits which are not designed or rated as radiation hardened and which are–

(a) (a) bipolar monolithic integrated circuits having all of the following characteristics–

(i) designed to perform a single digital logic function or a combination thereof;

(ii) a basic gate propagation delay time not less than 5 nanoseconds;

(iii) a product of the basic gate propagation delay time (in nanoseconds) and the basic gate power dissipation per gate (in milliwatts) not less than 70 pJ and;

(iv) not more than 24 input/output pads.

(b) (b) bipolar monolithic integrated circuits having all of the following characteristics–

(i) designed for operation in civil applications;

(ii) being electronic switches, externally controlled by inductive, magnetic or optical means;

(iii) being threshold valve switches;

(iv) with switching times of 0.5 micro-seconds or more; and

(v) not more than 24 input/output pads.

(c) (c) Monolithic integrated circuits having all of the following characteristics–

(i) no "user-accessible microprogrammability";

(ii) designed for and by virtue of circuit design limited to use in civil radio or television receivers;

(iii) rated for operation at 11 MHz or less;

(iv) not designed for station scanning applications;

(v) not utilising charge-coupled device (CCD) technology;

(vi) not intended for beam lead bonding;*and*

(vii) if intended for video or luminance amplifiers, having a maximum rated supply voltage not exceeding 30 V;

and a typical bandwidth not exceeding 7.5 MHz;

(d) (d) "Monolithic integrated circuits" having all of the following characteristics–

(i) no "user-accessible microprogrammability";

(ii) not utilising charge-coupled device (CCD) technology;

(iii) not intended for beam lead bonding;*and*

(iv) designed or programmed by the manufacturer for Timekeeping applications (eg watches or clocks) or Cardiac pacemakers or hearing aids;

(e) (e) amplifier monolithic integrated circuits, the following–

(i) audio amplifiers having a maximum rated power output of 25 W or less at a case temperature of 298 K (25°C);

(ii) operational amplifiers, having all of the following characteristics–

(a) a typical unity-gain open-loop bandwidth of not more than 5 MHz;

(b) a typical open-loop voltage gain of not more than 562,000 or 115 dB;

(c) a maximum intrinsic rated input offset voltage of not less than 2.5 mV; and

(d) a typical slew rate at unity gain not exceeding 2.5 volt/microsecond;

(f) (f) voltage monolithic integrated circuits as follows–

(i) voltage comparators, having a maximum input offset voltage of no less than 5 mV and a typical switching speed, ie typical response time of no less than 50 nanoseconds;

(ii) linear type voltage regulators, having a rated nominal output voltage of 40 V or less and a maximum output current of 1 A or less;

(iii) switching type voltage regulators, having a rated nominal output voltage of 40 V or less and a maximum output current of 150 mA or less;

(6) Encapsulated integrated circuits which are not designed or rated as radiation hardened and which are–

(a) (a) not rated for operation at an ambient temperature below 223 K (–40°C) or above 358 K (85°C);

(b) (b) packaged in hermetically sealed ceramic packages specified in subhead (b) above;

(c) (c) containing unencapsulated integrated circuits specified in subhead 5 above;

In this entry–

"assembly" means a number of components (i.e. circuit elements, discrete components, microcircuits) connected together to perform a specific function or functions, replaceable as an entity (and normally capable of being disassembled);

"circuit element" means a single active or passive functional item in an electronic circuit, such as one diode, one transistor, one resistor or one capacitor;

"discrete component" means a separately packaged circuit element with its own external connections;

"film type microcircuit" means an array of circuit elements and metallic interconnections formed by deposition of a thick or thin film on an insulating substrate;

"hybrid microcircuit" means a microcircuit consisting of a combination of film type microcircuits and monolithic integrated circuit elements or combinations of either with discrete components or circuit elements;

"microcircuit" means a device in which a number of passive and active circuit elements are considered as indivisibly associated on or within a continuous structure to perform the function of a circuit;

"microcomputer microcircuit" means an electronic logic unit capable of executing instructions from internal memory on data contained in the internal memory;

"microprocessor microcircuit" means a single package (normally single-chip) electronic logic unit capable of executing from external memory a series of general purpose instructions contained in the external memory;

"module" means an assembly, replaceable as an entity, not normally capable of being disassembled;

"monolithic integrated circuit" means a microcircuit fabricated as a single component consisting of elements formed in or on a single semi-conducting subtrate by diffusion, implantation or deposition;

"multichip integrated circuit" means a microcircuit containing two or more monolithic integrated circuit

	chips bonded to a common substrate; "optical integrated microcircuit" means a microcircuit containing one or more elements designed to function as a photosensor or photoemitter, or to perform optical or electro-optical functions; "prediffused microcircuit" means an arrangement of elements of monolithic integrated circuits, formed within a single semi-conducting substrate, which can be subsequently interconnected or otherwise modified to perform one of a variety of functions; and "related integrated optical microcircuit" means a microcircuit containing one or more elements designed to function as a photosensor or photoemitter, or to perform optical or electro-optical functions.	
—	Burst transmitters and associated receiving equipment (except simple on-line morse or other data signal convertors or standard items of ADP equipment) and specialised assemblies, sub-assemblies and components therefor	A
	In this entry a burst transmitter is any electronic equipment or device for use with radio or other communications systems, whether part of a transmitter or modulation device or ancillary to it, which has a capability to accept and store data (telegraphic, speech or other) and to transmit these at transmission speeds/bit rates which are multiples of the input keying speed/bit rates,	

	the purpose or effect of which is to reduce total message duration time and thus to evade detection by other than the intended recipient.	
—	Electrical or electronic equipment, whether or not separately specified in an entry in this Schedule, in respect of which a certificate has been issued to the knowledge of the exporter by or on behalf of the Secretary of State to the effect that the equipment to which the certificate relates meets or has been modified or designed to meet government standards concerned with the limitation of compromising electromagnetic radiation	A

GROUP 3G

Note. Goods specified in the heads of this Group may also be specified in Group 1 of this Part of this Schedule.

Scientific Instruments and Apparatus, Servo-Mechanisms and Photographic Equipment.

IL1565	Computers, electronic, related equipment, equipment or systems incorporating such computers, and specially designed components and accessories for such computers and related equipment, the following–	
	(1) Analogue or digital computers and related equipment therefor, designed or modified for use in airborne vehicles, missiles or space vehicles and rated for continuous operation at temperatures from below 228 K (–45°C) to above 328 K (+55°C)	A
	(2) Analogue computers other than those specified in head (1) above, and related equipment therefor	A

except those having neither of the following characteristics–

(a) (a) capable of containing more than 20 summers, integrators, multipliers or function generators; nor

(b) (b) having facilities for readily varying the interconnections of the components specified in (a) above.

(3) Digital computers other than those specified in head (1) above, and related equipment therefor, having any of the following characteristics–

(a) (a) designed or modified to limit electro-magnetic radiation to levels below those acceptable for normal civil use ... ... A

(b) (b) ruggedised or radiation-hardened for military use; or A

(c) (c) modified for military use ... ... A

(d) (d) designed or modified for certifiable multi-level security or certifiable user isolation applicable to government classified material or to applications requiring an equivalent level of security.

(4) Equipment or systems incorporating analogue or A

digital computers specified in heads (1) or (3) above ... ...

(5) Hybrid computers, and related equipment therefor, having all the following characteristics–

(a) (a) the analogue section as specified in head (2) above ... ... A

(b) (b) the digital section having an internal fixed or alterable storage of more than 2,048 bit; and ... ... A

(c) (c) incorporating facilities for processing numerical data from the analogue section in the digital section or vice versa ... ... A

(6) Digital computers, or analogue computers specified in heads (1) and (2) above, incorporating equipment for interconnecting analogue computers with digital computers ... ... A

(7) Digital computers, and related equipment therefor, other than those specified in heads (1), (3) and (6) above, whether or not embedded in, incorporated in or associated with equipment or systems, including but not limited to the following–

(a) (a) digital computers and related equipment designed or modified for–

(i) signal processing ... ... A

(ii) image enhancement ... ... A

(iii) local area networks ... ... A

(iv) multi-data-stream processing	A
(v) combined recognition, understanding and interpretation of image, continuous (connected) speech or connected word text, other than signal processing or image enhancement	A
(vi) real time processing of sensor data–	A
(a) concerning events occurring outside the computer using facility; and	
(b) provided by equipment specified in the entries in Group 3F relating to navigation, direction finding, radar and airborne communication equipment; communication, detection or tracking equipment; marine or terrestrial acoustic or ultrasonic systems; or telemetering and telecontrol equipment	
(vii) microprocessor or microcomputer development systems	A
(viii) fault tolerance	A
(ix) user-accessible microprogrammability	A
(x) data (message) switching	A
(xi) stored-programme-controlled circuit switching	A
(xii) wide-area networks	A
(b) (b) digital computers and related equipment therefor having both	

of the following characteristics–

(i) size, weight, power consumption and reliability or other characteristics, such as bubble memory, allowing easy application in mobile tactical military systems; and ... ... A

(ii) ruggedised above the level required for a normal commercial (office) environment but not necessarily to that specified in head (3)(b) above ... ... A

except

(i) digital computers or related equipment therefor embedded in other equipment or systems and having all of the following characteristics–

(a) being designed and used for non-strategic applications;

(b) by nature of design or performance restricted to the particular application for which they have been designed;

(c) not being the principal element of the other equipment or systems in which they are embedded;

(d) not being embedded in equipment or systems described elsewhere in this Schedule;

(e) the total processing data rate of any one embedded digital computer not exceeding 43 million bit per second;

(f) the sum of the total processing data rate of each embedded digital computer not exceeding 100 million bit per second; and

(g) the embedded digital computers or related equipment therefor not including either–(i)equipment or systems specified in head (3) of the entry in Group 3F relating to communication transmission equipment or in the entry in this group relating to stored-programme-controlled communication switching equipment; or(ii)equipment specified in head (7)(a) above, other than for–(a)signal processing or image enhancement when lacking user-accessible programmability and when embedded in medical imaging equipment; or(b)local area networks implemented by using integral interfaces designed to meet ANSI/IEEE Standard 488-1978 or IEC Publication 625–1;

(h) not including specified related equipment other than input/output control unit-disc drive combinations having all of the following characteristics–(i)a total connected net capacity not exceeding 200 million bits(ii)a total transfer rate not exceeding 5.5 million bit per second(iii)no more than one independent drive and(iv)a total access rate not exceeding 40 accesses per second

(ii) digital computers or related equipment therefor incorporated in other equipment or systems and having all of the following charcteristics–

(a) not being the principal element of the other equipment or systems in which they are incorporated;

(b) not being incorporated in equipment or systems specified elsewhere in this Schedule;

(c) the total processing data rate of any one incorporated digital computer not exceeding 15 million bit per second;

(d) the total internal storage available to the user not exceeding 9.8 million bit; and

(e) the incorporated digital computers or related equipment therefor not including–(i)related equipment specified elsewhere in this Schedule; (ii)equipment or systems specified in head (3) of the entry in Group 3F relating to communication transmission equipment or in the entry in Group 3F relating to stored-programme-controlled communication switching equipment; (iii)equipment specified in head 7(b) above; or(iv)equipment specified in head 7(a) above, other than for– (a)signal processing or image enhancement when lacking user-accessible programmability and embedded in medical imaging equipment; or(b)local area networks implemented by using integral interfaces designed to meet ANSI/IEEE Standard 488-1978 or IEC Publication 625-1;

(iii) digital computers, other than those specified in heads 7(a) and 7(b) above, and related equipment in the form of complete systems and having all the following characteristics–

(a) shipped as complete systems;

(b) designed for identifiable civil use;

(c) not specially designed for any equipment specified elsewhere in this Schedule;

(d) having a total processing data rate not exceeding 6.5 million bit per second;

(e) having a total internal storage available to the user not exceeding 6.2 million bit;

(f) not incorporating any of the following–(i)a central processing unit implemented with more than two microprocessor or microcomputer microcircuits, other than any dedicated microprocessor or microcomputer microcircuit used solely for display, keyboard or input/output control, or any bit-slice microprocessor microcircuit;(ii)a microprocessor or microcomputer microcircuit with more than 16 bit word length or a bus architecture with more than 16 bit(iii)analogue-to-digital or digital-to-analogue converter microcircuits – (a)exceeding the limits specified in the entry in this Group relating to converters, analogue-to-digital and digital-to-analogue; and(b)other than for direct driven video monitors for normal public television; (iv)specified related equipment other than input/output control unit-disc drive combinations having all of the following characteristics–(a)a total transfer rate not exceeding 5.5 million bit per second;(b)a

total connected net capacity not exceeding 200 million bit;
(c)no more than one independent drive;
and(d)a total access rate not exceeding 40 accesses per second;
(v)related equipment specified elswhere in this Schedule;
or(vi)equipment specified in head (3) of the entry in Group 3F relating to communication transmission equipment or in the entry in this group relating to stored-programme-controlled communication switching equipment;

(iv) peripheral equipment, including that containing embedded microprocessor microcircuits which lack user-accessible-programmability, the following–

(a) card punches and readers;

(b) paper tape punches and readers;

(c) manually operated keyboards and teletype devices;

(d) manually operated graphic tablets having not more than 1,024 resolvable points along any axis;

(e) impact printers;

(f) non-impact printers, other than as specified in heads (2) or (3) of the entry in this Group relating to recording or reproducing equipment, not exceeding–(i)2,000 lines (30 pages) per minute; or(ii)600 characters per second;

(g) plotting equipment, other than as specified in heads (2) or (3) of the entry in this Group relating to recording or reproducing equipment, producing a physical record by ink, photographic, thermal or electrostatic techniques and having–(i)a linear accuracy not better than .2660.004%; and(ii)an active plotting area of not more than 1,700 mm by 1,300 mm;

(h) digitising equipment generating rectilinear coordinate data by manual or semi-automatic tracing of physical records and having–(i)a linear accuracy not better than .2660.004%; and(ii)an active digitising area of not more than 1,700 mm by 1,300 mm;

(i) optical mark recognition (OMR) equipment;

(j) optical character recognition (OCR) equipment which–(i)does not contain signal processing or image enhancement equipment; and(ii)is only for–(a)stylised OCR characters;(b)other internationally standardised stylised character fonts; or(c)other characters limited to non-stylised or hand-printed numerics and up to 10 hand-printed alphabetic or other characters;

(k) cathode-ray tube displays for which circuitry and character-generation devices, external to the tube, limit the capabilities to– (i)alpha-numeric characters in fixed formats;(ii)graphs composed only of the same basic elements as used for alpha-numeric character composition; or(iii)graphic displays for which the sequence of symbols and basic elements of symbols are fixed;

(l) cathode-ray tube graphic displays, other than those containing tubes specified in the entry in Group 3F relating to electronic cathode-ray tubes, limited as follows– (i)the maximum bit transfer rate from the electronic computer to the display not exceeding 9,600 bit per second, other than direct driven video monitors;(ii)not more than 1,024 resolvable elements along any axis; and(iii)not more than 16 shades of grey or colour;

(m) cathode-ray tube graphic displays, other than those containing tubes specified in the entry in Group 3F relating to electronic cathode-ray tubes, provided that they are–(i)part of industrial or medical equipment; and(ii)not specially designed for use with electronic computers;

(n) graphic displays specially designed for signature or security checking having an active display area not exceeding 150 sq cm;

(o) other displays, provided that–(i)circuitry and character-generation devices external to the display device (for example, panel or tube), and the construction of this display device limit its capabilities to–(a)alpha-numeric characters in fixed formats;(b)graphs composed only of the same basic elements as used for alpha-numeric character composition; or(c)graphic displays for which the sequence of symbols and basic elements of symbols are fixed; and(ii)the displays are limited to–(a)a capability for displaying no more than 3 levels (off, intermediate and full on);(b)a minimum character height of not less than 5.5 mm if the area is 1,200 sq cm or less, or not less than 20 mm if the area is more than 1,200 sq cm; and(c)not having circuitry or non-mechanical character-generation devices as an integral part of the display device;

(p) light gun devices or other manual graphic input devices which are–(i)part of displays not specified elsewhere in this Group; and(ii)limited to 1,024 resolvable elements along any axis;

(q) disc drives for non-rigid magnetic media (floppy discs) which do not exceed–(i)a gross capacity of 17 million bit;(ii)a maximum bit transfer rate of 0.52 milion bits per second;(iii)an access rate of 12 accesses per second;

(r) cassette/cartridge tape drives or magnetic tape drives which do not exceed–(i)a maximum bit packing density of 131 bit per mm (3300 bit per inch) per track;(ii)a maximum bit transfer rate of 2.66 million bit per second; or

(v) input/output interface or control units including those containing embedded microprocessor microcircuits which lack user-accessible programmability, the following–

(a) those designed for use with peripheral equipment specified in exception (iv) of this head; or

(b) those designed for use with digital recording equipment specially designed to use magnetic card, tag, label or bank cheque recording media, specified in head (l)(b) of the entry in this Group relating to recording or reproducing equipment.

(For technology relating to this entry, see the entry in Group 4 relating thereto.)

In this entry–

"access rate" of a seek mechanism means the reciprocal of the average access time of the seek mechanism, "average access time" of a seek mechanism means the sum of the average seek time and the latency time, "average seek time" means the sum of the maximum seek time and twice the minimum seek time, "maximum seek time" is for fixed head devices zero or for moving head or moving media devices the rated time to move between the two most widely separated tracks, "minimum seek time" is for fixed head devices zero or for moving head or moving media devices the rated time to move from one track to an adjacent track, and "latency time" means the rotational period divided by twice the number of independent read/write heads per track;

"analogue computer" means equipment which can in the form of one or more continuous variables, accept process and output data;

"associated" with equipment or systems means not feasibly capable either of being removed from such equipment or systems or of being used for other purposes, and not essential to the operation of such equipment or systems;

"communication channel" means the transmission path or circuit including the terminating transmission or receiving equipment (modems) for transferring digital information between distant locations;

"data device" means equipment capable of transmitting or receiving sequences of digital information;

"data (message) switching" means the technique, including but not limited to store-and-forward or packet switching, for:

(a) (a) accepting data groups (including messages, packages, or other digital or telegraphic information groups which are transmitted as a composite whole);

(b) (b) storing (buffering) data groups as necessary;

(c) (c) processing part or all of the data groups, as necessary, for the purpose of control (routing, priority, formatting, code conversion, error control, retransmission or journaling), transmission or multiplexing; and

(d) (d) retransmitting (processed) data groups when transmission or receiving facilities are available;

"digital computer" means equipment which can, in the form of one or more continuous variables, accept data, store data or instructions in fixed or alterable storage devices, process data by means of a stored sequence of instructions which is modifiable and provide output of data;

"embedded" in equipment or systems means not feasibly capable either of being removed from such equipment or systems or of being used for other purposes;

"fault tolerance" means the capability to perform correctly without human intervention after failure of any assembly, so that there is no single point in the system the failure of which could cause catastrophic failure of the system's functioning; and "assembly" means a number of components (circuit elements, discrete components, microcircuits) connected together to perform a specific function or functions, replaceable as an entity (and normally capable of being disassembled);

"hybrid computer" means equipment which can accept data, process data in both analogue and digital representations and provide output of data;

"image digitiser" means a device for directly converting analogue representation of an image into a digital representation;

"image enhancement" means the processing of externally derived information-bearing images by algorithms such as time-compression, filtering, extraction, selection, correlation, convolution or transformations between domains, excluding algorithms using only linear or rotational transformation of a single image, such as translation, feature extraction, registration or false coloration;

"incorporated" in equipment or systems means feasibly capable either of being removed from such equipment or systems or of being used for other purposes, but is essential to the operation of such equipment or systems;

"local area network" means a data communication system which allows an arbitrary number of independent data devices to communicate directly with each other and is confined to a geographical area of moderate size;

"main storage" means the primary storage for data or instructions for rapid access by a central processing unit. It consists of the internal storage of a digital computer and any hierarchical extension thereto, such as cache storage or non-sequentially accessed extended storage;

"maximum bit packing density" means the density of recording specified in accordance with the appropriate ANSI or ISO Standard (e.g. ANSI X3.14–1979, ISO 1862–1975; ANSI X3.22–1973, ISO 1873–1876; ANSI X3.39–1973, ISO 3788–1976; ANSI X3.48–1977, ISO 3407–1976; ANSI X3.56–1977, ISO 4057–1979; ANSI X3.54–1976);

"maximum bit transfer rate"–

(a) (a) of a drum or disc drive is the product of the maximum number of binary digit (bit) positions per unformatted track and the number of tracks which simultaneously can be read or written, divided by the rotational period;

(b) (b) of a magnetic tape drive is the product of the "maximum bit packing density", the number of data bits per character (ANSI) or per row (ISO), and the maximum tape read/write speed;

"microprogramme" means a sequence of elementary instructions maintained in a special storage, the execution of which is initiated by the introduction of its reference instructions into an instruction register;

"most immediate storage" means the portion of the main storage most directly accessible by the central processing unit. For single level main storage, this is the internal storage, and for hierarchical "main storage", this is the cache storage; the instruction stack; or the data stack;

"multi-data-steam processing" means the microprogramme or equipment architecture technique which permits processing two or more data sequences under the control of one or more instruction sequences by means such as parallel processing; or structured arrays of processing elements;

"net capacity" of a drum, disc or cartridge type streamer tape drive, or a bubble memory is the total capacity designed to be accessible to the digital computer excluding error control bits;

"non-volatile storage" means a storage device the contents of which are not lost when power is removed;

"principal element" means a digital computer or related equipment which is either embedded or incorporated in another equipment or system and which in replacement value is more than 35% of the replacement value of the total equipment or system (including the digital computer or related equipment);

"programme" means a sequence of instructions to carry out a process in, or convertible into, a form executable by an electronic computer;

"real time processing" means a processing of data by an electronic computer in response to an external event according to time requirements imposed by the external event;

"related equipment" means the following equipment embedded in, incorporated in or associated with electronic computers – equipment for interconnecting analogue computers with digital computers or for interconnecting digital computers, equipment for interfacing electronic computers to local area networks or to wide area networks, communication control units and other input/output control units, recording or reproducing equipment relating to this entry described in the entry in this group relating to such equipment, displays or other peripheral equipment;

"signal processing" means the processing of externally derived information-bearing signals by algorithms such as time compression, filtering, extraction, selection, correlation, convolution or transformations between domains (such as Fast Fourier Transform or Walsh Transform);

"software" means a collection of one or more programmes or microprogrammes fixed in any tangible medium of expression;

"terminal device" means a data device which does not include process control sensing and actuating devices; and which is capable of accepting or producing a physical record, accepting a manual input, or producing a visual output. Normal groupings of such equipment (such as a combination of paper tape punch/reader and printer), connected to a single data channel or communication channel, are considered as a single terminal device;

"total internal storage available to the user" means the sum of the individual capacities of all internal user-alterable or user-replacement storage devices which may be included in the equipment at the same time and used to store software instructions or data;

"total processing data rate"–

(a) (a) of a single central processing unit, is its processing data rate;

(b) (b) of multiple central processing units which do not share direct access to a common main storage, is the individual processing data rate of each central processing unit, that is each unit is separately treated as a single central processing unit as in (a) above;*or*

(c) (c) of multiple central processing units, which partially or fully share direct access to a common main storage at any level, is the sum of the highest of the individual processing data rates of all central processing units; and 0.75 times the processing data rate of each remaining central processing unit, sharing the same main storage assuming the configuration of equipment, which would maximize this sum of rates;

"processing data rate" is the maximum of either: the "floating point processing data rate" (R_f), or the "fixed point processing data rate" (R_x).

It should be noted that the "processing data rate" of a central processing unit implemented with two or more microprocessor microcircuits, not including any dedicated microprocessor microcircuit used solely for display, keyboard or input/output control, is the sum of the individual "processing data rates" of all these microprocessor microcircuits;

"floating point processing data rate" (R_f) is the sum of:

(1) 0.85 times the number of bits in a fixed point instruction (n_{ix}) or 0.85 times the number of bits in a floating point instruction (n_{if}), if no fixed point instructions are implemented;

(2) 0.15 times the number of bits in a floating point instruction (n_{if});

(3) 0.40 times the number of bits in a fixed point operand (n_{ox}) or 0.40 times the number of bits in a floating point operand (n_{of}), if no fixed point instructions are implemented; and

(4) 0.15 times the number of bits in a floating point operand (n_{of});

divided by the sum of

(1) 0.85 times the execution time for a fixed point addition (t_{ax}) or for a floating point addition (t_{af}), if no fixed point instructions are implemented;

(2) 0.09 times the execution time for a floating point addition (t_{af}); and

(3) 0.06 times the execution time for a floating point multiplication (t_{mf}) or for the fastest available subroutine (t_{msub}) to simulate a floating point multiplication instruction, if no floating point multiplication instructions are implemented.

Thus–

$$Rf = \frac{(0.85)n_{ix} + (0.15)n_{if} + (0.40)n_{ox} + (0.15)n_{of}}{(0.85)\,t_{ax} + (0.09)\,t_{af} + (0.06)\,t_{mf}}$$

or if no fixed point instructions are implemented:

$$Rf = \frac{(1.00)\,n_{if} + (0.55)\,n_{of}}{(0.94)\,t_{af} + (0.06)\,t_{mf}}$$

or, if no floating point multiplication instructions are implemented ($t_{mf} = t_{msub}$):

$$Rf = \frac{(0.85)n_{ix} + (0.15)n_{imf} + (0.40)n_{ox} + (0.15)n_{of}}{(0.85)\,t_{ax} + (0.09)\,t_{af} + (0.06)\,t_{msub}}$$

If a “digital computer” has neither floating point addition nor floating point multiplication instructions, then its floating point processing data rate is equal to zero.

"fixed point processing data rate" (R_x) is the sum of:

(1) 0.85 times the number of bits in a fixed point addition instruction (n_{iax});

(2) 0.15 times the number of bits in a fixed point multiplication instruction (n_{imx}); and

(3) 0.55 times the number of bits in a fixed point operand (n_{ox});

divided by the sum of:

(1) 0.85 times the execution time for a fixed point addition (t_{ax}); and

(2) 0.15 times the execution time for a fixed point multiplication (t_{mx}) or for the fastest available subroutine (t_{msub}) to simulate a fixed point multiplication instruction if no fixed point multiplication instructions are implemented.

Thus:

$$Rx = \frac{(0.85)\ n_{iax} + (0.15)\ n_{imx} + (0.55)\ n_{ox}}{(0.85)\ t_{ax} + (0.15)\ t_{mx}}$$

or If no fixed point multiplication instructions are implemented (t_{mx}equals; t_{msub}):

$$Rx = \frac{(0.85)\ n_{iax} + (0.15)\ n_{imx} + (0.55)\ n_{ox}}{(0.85)\ t_{ax} + (0.15)\ t_{msub}}$$

If a "digital computer" has neither fixed point addition nor fixed point multiplication instructions, then its fixed point processing data rate is equal to zero.

"number of bits in a fixed point addition instruction (n_{iax}), fixed point multiplication instruction (n_{imx}), floating point addition instruction (n_{iaf}), or floating point multiplication instruction (n_{imf}) is the appropriate shortest single fixed or floating point instruction length which permits full direct addressing of the main storage. It should be noted that when multiple instructions are required to simulate an appropriate single instruction, the number of bits in the above instructions is defined as 16 bit plus the number of bits (b_{iax}, b_{imx}, b_{iaf}, b_{imf}) which permits full direct addressing of the main storage;"

"number of bits in a fixed point operand" (n_{ox}) is the shortest fixed point operand length, or 16 bit, whichever is greater.

"number of bits in a floating point operand" (n_o) is the shortest floating point operand length or 30 bit, whichever is greater. If the addressing capability of an instruction is expanded by using a base register, then the number of bits in an instruction, fixed or floating point, addition or multiplication is the number of bits in the instruction with the standard address length including the number of bits necessary to use the base register.

"execution time" is

(a) (a) the time certified or published by the manufacturer for the execution of the fastest appropriate instruction, under the following conditions–

(1) no indexing or indirect operations are included;

(2) the instruction is in the most immediate storage;

(3) one operand is in the accumulator or in a location of the most immediate storage, which is acting as the accumulator;

(4) the second operand is in the most immediate storage; and

(5) the result is left in the accumulator or the same location in the most immediate storage, which is acting as the accumulator;

(b) (b) if only the maximum and minimum execution times of the instructions are published, the sum of:

the maximum execution time of an instruction (t_{max}), and twice the minimum execution time of this instruction (t_{min}); divided by three.

Thus:

$$t = \frac{t_{max} + 2 \times t_{min}}{3}$$

(t stands for any of the values t_{ax}, t_{af}, t_{mx} or t_{mf});

(c) (c) for central processing units which simultaneously fetch more than one instruction from one storage location, the average of the execution times when executing instructions fetched from all possible locations within the stored word. If the longest fixed point operand length is smaller than 16 bit, execution time is taken as the time required for the fastest available subroutine to simulate a 16 bit fixed point operation. If the addressing capability of an instruction is expanded by using a base register, then the execution time includes the time for adding the content of the base register to the address part of the instruction;

"total transfer rate"–

(a) (a) of the input/output control unit – drum, disc or cartridge-type streamer tape drive combinations (R_{tdtot}) means the sum of the individual "transfer rates" of all input/output control unit – drum, disc or cartridge-type streamer tape drive combinations (R_{td}) provided with the system which can be sustained simultaneously assuming the configuration of equipment which would maximise this sum of rates. Thus:

$R_{tdtot} = \text{SUM } R_{td}$;

"transfer rate"–

(i) of an input/output control unit – drum or disc drive combination (R_{td}), is the smaller of either the input/output control unit transfer rate (R_{tc}), or the sum of the individual transfer rates of all independent seek mechanisms (R_{ts}).Thus:

$$R_{td} = \min (R_{tc}; \text{SUM } R_{ts})$$

(ii) of an input/output control unit – cartridge-type streamer tape drive combination (R_{tc}) is

(a) with rotational position sensing (rps), the product of the number of independent read/write channels (C) and the greatest "maximum bit transfer rate" ($R_{tsmaxmax}$) of all independent seek mechanisms; or

(b) without rotational position sensing (rps), two-thirds of this product. Thus:

$$R_{tc} = C \times R_{tsmaxmax} \text{ (with rps);}$$

or

$$R_{tc} = \frac{2}{3} \times C \times R_{tsmaxmax} \text{ (without rps)}$$

(iii) of an independent seek mechanism (R_{ts}) is the product of:

the maximum bit transfer rate (R_{tsmax}), and the rotational period (t_r);

divided by the sum of:

the rotational period (t_r), the minimum seek time (t_{smin}); and the latency time (t_l).Thus:

$$R_{ts} = \frac{R_{tsmax} \times t_r}{t_r + t_{smin} + t_l}$$

(b) (b) of the input/output control unit – magnetic tape drive combinations (R_{tttot}) is the sum of the individual transfer rates of all input/output control unit – magnetic tape drive combinations (R_{tt}) provided with the system which can be sustained simultaneously assuming the configuration of equipment which would maximise this sum of rates.

Thus:

$$R_{tttot} = \text{SUM } R_{ttt}$$

"transfer rate" of an input/output control unit – cartridge-type streamer or magnetic tape drive combination (R_{tt}) is the product of the number of independent read/write channels (C) the and greatest maximum bit transfer rate ($R_{ttmaxmax}$) of all tape drives.

Thus:

$$R_{tt} = C \times R_{ttmaxmax}$$

(c) of the input/output or communication control unit – directly connected data channel combinations, is the sum of the individual transfer rates of all data channels provided with the system which can be sustained simultaneously assuming the configuration of equipment which would maximise this sum of rates;

"transfer rate of any data channel" means the sum of the individual bit transfer rates of all the other peripheral devices, excluding terminal devices, which can be sustained simultaneously on the data channel;

"user-accessible microprogrammability" means the facility allowing a user to insert, modify or replace microprogrammes;

"user-accessible programmability" means the facility allowing a user to insert, modify or replace a programme by means other than a physical change in wiring or interconnections or the setting of function controls including entry of parameters; and

"virtual storage" means the storage space that may be regarded as addressable main storage by the user of a computer system in which virtual addresses are mapped into real addresses. (The size of virtual storage is limited by the addressing scheme of the computer system and not by the actual number of main storage locations.)

"wide area network" means a data communciation system which allows an arbitrary number of independent data devices to communicate with each other; may include local area networks; and is designed to interconnect graphically dispersed facilities.

IL1566 Software, the following–

(1) Software of any category, the following–

(a) (a) software designed or modified for any computer that is part of a computer series designed and produced in any country specified in Article 2(iv) of this Order ... ... A

except application software designed for and limited to–

(i) accounting, general ledger, inventory control, payroll, accounts receivable, personnel records, wages calculation or invoice control;

(ii) data and text manipulation including sort/merge, text editing, data entry or word processing;

(iii) data retrieval from established data files for purposes of report generation or inquiry for the functions specified in sub-heads (a)(i) or (a)(ii) above; or

(iv) the non real time processing of pollution sensor data at fixed sites or in civil vehicles for civil environmental monitoring purposes.

(b) (b) software designed or modified for the design, development or production of goods specified, other than as exceptions, elsewhere in this Schedule ... ... A

(c) (c) software designed or modified for:

(i) hybrid computers specified in the entry in this group relating to computers ... ... A

(ii) one or more of the functions described in sub-head 7(a) excepting (x) and (xi) of the entry in this group relating to computers or for digital computers or related equipment designed or modified for such functions ... ... A

except the minimum specially designed software in machine-executable form for digital computers and related equipment therefor specified as exceptions in sub-heads (a) and (b) under head (7) of the entry in this group relating to computers when supplied with the equipment or systems.

(d) (d) software for computer-aided design, manufacture, inspection or test of goods specified, other than as exceptions, A elsewhere in this Schedule ... ...

(e) (e) software designed or modified to provide certifiable multi-level security or certifiable user-isolation applicable to government-classified material or to applications requiring an equivalent level of security, or software to certify such software ... ... A

(2) Categorised software, the following–

(a) (a) development systems–

(i) those employing high-level language and designed for or containing programmes or data bases special to the development or production of–

(a) specially designed software specified, other than as an exception, elsewhere in this Schedule ... ... A

(b) software specified in sub-heads (1)(b) or (1)(c), of this entry, including any subset designed or modified for use as part of such a development system A

(ii) those employing high-level language designed for or containing the software tools and data bases for the development or production of software, such as, or equivalent to, an Ada Programming Support Environment (APSE) or any subset, A superset or derivative of APSE, including any subset of such a development system

(b) (b) programming systems–

(i) cross-hosted compilers and cross-hosted assemblers ... ... A

Note:For "cross-hosted" compilers or "cross-hosted" assemblers which have to be used in conjunction with microprocessor or microcomputer development instruments or systems described in IL1529, see that head.

(ii) compilers or interpreters designed or modified for use as part of a development system specified in sub-head (2)(a) above ... ... A

(iii) dissassemblers, decompilers or other software which convert programmes in object or assembly language into a higher level language A

except simple debugging applications software, such as mapping, tracing, check-point/restart, breakpoint, dumping and the display of the storage contents or their assembly language equivalent.

(c) (c) diagnostic systems or maintence systems designed or modified for use as part of a development system specified in sub-head (2)(a) above ... ...A

(d) (d) operating systems–

(i) those designed or modified specially for digital computers or related equipment exceeding any of the following limits– ... ...A

(a) central processing unit – main storage combinations –(i)total processing data rate of 48 million bit per second;(ii)total connected capacity of main storage of 25.2 million bit; and(iii)virtual storage capability of 512 M Byte;

(b) input/output control unit – drum, disc or cartridge-type streamer tape drive combinations–(i)total transfer rate of 15 million bit per second;(ii)total access rate of 320 accesses per second;(iii)total connected net capacity of 7,000 million bit; and(iv)maximum bit transfer rate of any drum or disc drive of 10.3 million bit per second;

(c) input/output control unit – bubble memory combinations – total conected net capacity of 2.1 million bit;

(d) input/output control unit – magnetic tape drive combinations –
(i)
"total transfer rate" of 5.2 million bit per second;
(ii)

twelve magnetic tape drives;
(iii)
maximum bit transfer rate of any magnetic tape drive of 2.6 million bit per second;
(iv)
maximum bit packing density of 63 bit per mm (1600 bit per inch) per track; and
(v)
maximum tape read/ write speed of 508 cm (200 inch) per second

(ii) those providing on-line transaction data processing which permits integrated teleprocessing and on-line updating of data bases ... ...A

(e) (e) application software–

(i) software for cryptologic or cryptanalytic applications ... ...A

(ii) artificial intelligence software, including software normally classified as expert systems enabling a digital computer to perform functions normally associated with human perception and reasoning or learning ... ...A

(iii) data base management systems which are designed to handle distributed data bases for–

(a) fault tolerance by using techniques such as maintenance of duplicated data bases, or

(b) integrating data at a single site from independent remote data bases ... ...A

(iv) software designed to adapt software resident on one digital computer for use on another digital computer both being of a type specified in the entry in this group relating to computers ... ...A

(For technology relating to this entry, see the entry in Group 4 relating thereto.)

In this entry –

"cross-hosted" refers to programming systems which produce programmes for a model of electronic computer different from that used to run the programming system, having code generators for equipment different from the host computer;

"development system" means software to develop or produce software. This includes software to manage those activities. Examples of a development system are programming support environments, software development environments, and programmer productivity aids;

"programming system" means software to convert a convenient expression of one or more processes (source code or source language) into equipment executable form (object code or object language);

"diagnostic system" means software to isolate or detect software or equipment malfunctions;

"maintenance system" means software to modify software or its associated documentation in order to correct faults, or for other updating purposes, or to maintain equipment;

"operating system" means software to control the operation of a digital computer or of related equipment, or the loading or execution of programmes;

"application software" means software other than a development system, programming system, diagnostic system, maintenance system or operating system;

"specially designed software" is defined as the minimum operating systems, diagnostic systems, maintenance systems and application software necessary to be executed on a particular equipment to perform the function for which it was designed. For other incompatible equipment to perform the same function requires modification of this software or addition of programmes.

"database management system" means application software to manage and maintain a database in one or more prescribed logical structures for use by other application software independent of the specific methods used to store or retrieve the database;

"distributed database" means a database which is physically located and maintained in part or as a whole in two or more interconnected electronic computers or related equipment, so that inquiries from one location can involve database access in other interconnected electronic computers or related equipment;

"high-level language" means a programming language that does not reflect the structure of any one given electronic computer or class of electronic computers;

"on-line updating" means processing in which the contents of a database can be amended within a period of time useful to interact with an external request.

IL1567	Stored-programme-controlled communication switching equipment or systems, specially designed components therefor and specially designed software for the use of such equipment or systems, the following–	
	(1) Communication equipment or systems for data (message) switching, including those for local area network or for wide area network	A
	(2) Communication equipment or systems for stored-programme-controlled circuit switching	A

except

(a) (a) key telephone systems which–

(i) do not provide direct dial access to a group of shared exchange lines or trunk circuits;

(ii) are not designed to be upgraded to private automatic branch exchanges (PABXs);

(iii) the software supplied

(a) is limited to the minimum specially designed software necessary for the installation, operation and maintenance of the equipment or systems and to machine-executable form; and

(b) does not include software specified in the entry in this group relating to cryptographic equipment, in sub-head (1)(e) of the entry in this group relating to software or in the entry in Group 1 relating to electronic equipment specially designed for military use, or software to permit modification of generic software or its associated documentation by the user;

(b) (b) stored-programme-controlled telegraph circuit switching equipment or systems which–

(i) are designed for civil use; and

(ii) provide only the services defined in CCITT Recommendations F.60 to 79, whereby telegraph subscribers can communicate directly and temporarily between themselves using start-stop telegraph equipment operating–

(a) at 300 baud or less; and

(b) with the international telegraph alphabets no 2 or 5;

(iii) the software supplied–

(a) is limited to the minimum specially designed software necessary for the installation, operation and maintenance of the equipment or systems and to machine-executable form; and

(b) does not include software specified in the entry in this group relating to cryptographic equipment, in sub-head (1)(e) of the entry in this group relating to software or in the entry in Group 1 relating to electronic equipment specially designed for military use, or software to permit modification of generic software or its associated documentation by the user; or

(c) (c) stored-programme-controlled telephone circuit switching equipment or systems, provided that–

(i) the equipment or systems are designed for fixed civil use as space division analogue exchanges or time division analogue exchanges, being private automatic branch exchanges (PABXs);

(ii) the equipment or systems do not contain digital computers or related equipment specified in heads (1) and (3), sub-heads (a)(i) to (a)(x) (inclusive) or (a)(xii) of head (7) or sub-head (b) of head (7) of the entry in this group relating to computers;

(iii) communication channels or terminal devices used for administrative and control purposes are fully dedicated to these purposes and do not exceed a total data signalling rate of 9,600 bit per second;

(iv) voice channels are limited to 3,100 Hz as defined in CCITT Recommendation G.151;

(v) the PABXs do not have trunk circuit-to-subscriber line ratios exceeding 35% for PABXs with less than 100 subscriber lines or 20% for PABXs with 100 or more subscriber lines;

(vi) the PABXs do not have the following features–

(a) multi-level call pre-emption, including overriding or seizing of busy subscriber lines, trunk circuits or switches; or

(b) common channel signalling;

(vii) the software supplied–

(a) is limited to the minimum specially designed software necessary for the installation, operation and maintenance of the equipment or systems and to machine-executable form; and

(b) does not include software specified in the entry in this group relating to cryptographic equipment, in sub-head (1)(e) of the entry in Group 3G relating to software or in the entry in Group 1 relating to electronic equipment specially designed for military use, or software to permit modification of generic software or its associated documentation by the user.

In this entry–

"stored-programme-controlled circuit switching" is the technique for establishing, on demand and until released, a direct (space-division switching) or logical (time-division switching) connection betweens circuits based on switching control information derived from any source or circuit and processed according to the stored programme by one or more electronic computers;

"local area network" means a data communication system which allows an arbitrary number of independent data devices to communicate directly with each other and is confined to a geographical area of moderate size, such as an office building, plant, campus or warehouse; and

"wide area network" means a data communication system which allows an arbitrary number of data devices to communicate with each other and is designed to interconnect geographically dispersed

	facilities. It may include local networks.	
	(For technology relating to this entry, see the entry in Group 4 relating thereto.)	
IL1568	Amplifiers, electronic or magnetic, specially designed for use with resolvers, the following–	
	(1) Isolation types having a variation of gain constant (linearity of gain) of 0.2% or better	A
	(2) Summing types having a variation of gain constant (linearity of gain) or an accuracy of summation of 0.2% or better	A
	(3) Types employing solid state Hall effect	A
	(4) Types designed to operate below –55°C or above +125°C	A
	(5) Specially designed components and test equipment (including adapters and couplers) for the equipment specified in heads (1) to (4) above (inclusive)	A
	Converters, analogue-to-digital and digital-to-analogue, other than digital voltage measuring apparatus specified in Group 3F, the following–	
	(1) Electrical-input type analogue-to-digital converters having any of the following characteristics–	
	(a) (a) a conversion rate of more than 200,000 complete conversions per second at rated accuracy;	A
	(b) (b) an accuracy in excess of 1 part in more than 10,000	A

of full scale over the specified operating temperature range; or ... ...

(c) (c) a figure of merit of 10u28 or more (derived from the number of complete conversions per second divided by the accuracy) ... ... A

(2) Electrical-input type digital-to-analogue converters having any of the following characteristics–

(a) (a) a maximum settling time of less than 3 microseconds for voltage output devices and of less than 250 nanoseconds for current output devices; ... ... A

(b) (b) an accuracy in excess of 1 part in more than 10,000 of full scale over the specified operating temperature range; or ... ... A

(c) (c) a figure of merit of more than 2 × 10u29 for voltage output converters or 1 × 10u21u20 for current output converters A

In this head "settling time" means the time required for the output to come within one half bit of the final value when switching between any two levels of the converters and the "figure of merit" is the reciprocal of the product of the maximum settling

	time in seconds and the accuracy.	
	(3) Solid state synchro-to-digital and digital-to-synchro converters and resolver-to-digital or digital-to-resolver converters (including multi-pole resolvers), having a resolution of better than .266 1 part in 5,000 per full synchro revolution for single speed synchro systems or better than .266 1 part in 40,000 for dual speed systems	A
	(4) Mechanical input types, including shaft-position encoders and linear displacement encoders but excluding complex servo-follower systems, the following–	
	(a) (a) rotary types having an accuracy of better than .266 1 part in 40,000 of full scale	A
	(b) (b) linear displacement types having a resolution of better than .266 5 micrometres	A
	(5) Types designed to operate below –55°C or above +125°C	A
	(6) Specially designed components and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (5) above (inclusive)	A
IL1568	Electro-optical devices designed to monitor relative rotation of remote surfaces; and specially designed components and test equipment (including adaptors and couplers) for such equipment	A

IL1568	Induction potentiometers (including function generators and linear synchros), linear and non-linear, having any of the following characteristics–	
	(1) A rated conformity of 0.25% or less, or of 13 minutes of arc or less–	A
	(2) Types employing solid state Hall effect–	A
	(3) Types designed for gimbal mounting; or	A
	(4) Types designed to operate below –55°C or above +125°C–	A
	and specially designed components and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (4) above (inclusive)	A
IL1568	Induction rate (tachometer) generators, synchronous and asynchronous, with a housing diameter of 50.8 mm and smaller and a length (without shaft-ends) of 101.6 mm or less or with a diameter-to-length ratio greater than 2:1, having any of the following characteristics–	
	(1) with a rated linearity of 0.1% or less	A
	(2) being temperature compensated or temperature corrected types	A
	(3) designed to operate below –55°C or above +125°C	A
	and specially designed components and test equipment (including adaptors and couplers) therefor	A
IL1568	Potentiometers, having a rated conformity better than 0.25% for a linear potentiometer	

	or 1% for a non-linear potentiometer, the following–	
	(1) Linear potentiometers having a constant resolution and a rated linearity of better than 0.05% absolute	A
	(2) Non-linear potentiometers having a variable resolution and a rated conformity of–	
	(a) (a) 1% or less when the resolution is inferior to that obtained with a linear potentiometer of the same type and of the same track length; or	A
	(b) (b) 0.5% or less when the resolution is better than or equal to that obtained with a linear potentiometer of the same type and of the same track length	A
	(3) Types designed for gimbal mounting	A
	(4) Types designed to operate below –55°C or above +125°C	A
	(5) Specially designed components and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (4) above (inclusive)	A
IL1568	Semi-conductor Hall field probes and specially designed components and test equipment (including adaptors and couplers) therefor, the following–	
	(1) Types made of indium arsenide-phosphide	A
	(2) Types coated with ceramic or ferritic materials (including tangential field	A

	probes, multipliers, modulators and recorder probes)	
	(3) Types with an open circuit sensitivity greater than $\frac{0.12 \text{ Volt}}{\text{Ampere} \times \text{Kilogauss}}$	A
	In this entry "open circuit sensitivity" is calculated by dividing the open circuit Hall voltage by the product of the control current in A and the nominal value of the control field.	
IL1568	Servo-motors (gear-head or plain) the following–	
	(1) Types designed to operate from power sources of more than 300 Hz, except those designed to operate from power sources of over 300 Hz up to but not exceeding 400 Hz with a temperature range of from –55°C to +125°C	A
	(2) Types designed to have a torque-to-inertia ratio of 50,000 radians per second or greater	A
	(3) Types incorporating special featues to secure internal damping	A
	(4) Types designed to operate below –55°C or above +125°C	A
	(5) Specially designed components and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (4) above (inclusive)	A
IL1568	Synchros, resolvers, microsyns, synchro-tels and inductosyns, having any of the following characteristics–	
	(1) A rated electrical error of 7 minutes of arc or less or of 0.2% or less of maximum output voltage	A

	(2) A rated dynamic accuracy for receiver types of 1° or less, except that for units of size 30 (76.2 mm in diameter) or larger, a rated dynamic accuracy of less than 1°	A
	(3) Multi-speed from single shaft types	A
	(4) Types designed for gimbal mounting	A
	or	
	(5) Types designed to operate below –55°C or above +125°C;	A
	and specially designed components and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (5) above (inclusive)	A
IL1568	Synchronous motors, the following–	
	(1) Types not exceeding size 20 (50.8 mm in diameter) having synchronous speeds in excess of 3,600 r.p.m.	A
	(2) Types designed to operate from power sources of more than 400 Hz	A
	(3) Types designed to operate below –55°C or above +125°C	A
	(4) Specially designed components and test equipment (including adaptors and couplers) for the equipment specified in heads (1) to (3) above (inclusive)	A
IL1568	Torquers, direct current and alternating current (torque motors specially designed for gyros and stabilised platforms); and specialised components and test equipment (including	A

	adaptors and couplers) for such equipment	
IL1570	Thermoelectric materials and devices, the following–	
	(1) Thermoelectric materials with a maximum product of the figure of merit (Z) and the temperature (T in degrees K) in excess of 0.75	A
	(2) Junctions and combinations of junctions using any of the materials specified in head (1) above	A
	(3) Heat absorbing or electric power generating devices incorporating any of the junctions specified in head (2) above	A
	(4) Other power generating devices which generate in excess of 22 W per kg or of 17.7 kW per cubic metre of the devices' basic thermoelectric components	A
	(5) Specially designed components for the equipment specified in heads (3) and (4) above (inclusive)	A
	In this entry–	
	“the figure of merit (Z)” equals Seebeck coefficient squared divided by the product of electrical resistivity and thermal conductivity; and	
	the weight and cubic measurement in head (4) are not intended to encompass the complete device but to include only the thermoelectric elements and assembly and the components for pumping calories.	
IL1571	Magnetometers, magnetometer systems and related equipment, the following–	
	(1) Magnetometers and magnetometer systems having	

or capable of having a sensitivity better than .266 1 gamma (.266 10u2–u25 oersteds), ...A

( ) except magnetometers having sensitivities not better than .266 0.1 gamma (.266 10u2–u26 oersteds) where the reading rate capability is not faster than once per half-second.

(2) Magnetometer test facilities able to control magnetic field values to an accuracy of 1 gamma (.266 10u2–u25 oersteds) or less A

(3) Magnetic compensation systems using digital computers, non-magnetic platforms and calibration systems ... ...A

(4) Specially designed components for the equipment specified in heads (1) to (3) above (inclusive) ... ...A

In this entry "sensitivity" is defined as the visually recognised minimum sinusoidal signal in the frequency range of 0.025 Hz to 1.5 Hz when signal-to-noise ratio is higher than 1.

IL1572 Recording or reproducing equipment and recording media and specially designed components therefor, the following–

(1) Recording or reproducing equipment using magnetic techniques, ...A

except

(a) (a) equipment specially designed for audio programmes on tape or disk, analogue recording or reproducing of video programmes on tape or disk or digital reproducing (ie, play-back only) of video programmes from tape or disk;

(b) (b) equipment specially designed to use magnetic card, tag, label or bank cheque recording media with a magnetic surface area not exceeding 85 cmu22 (13 sq ins);

(c) (c) analogue magnetic tape recorders having all of the following characteristics–

(i) bandwidth at maximum speed not exceeding 300 kHz per track;

(ii) recording density not exceeding 2,000 magnetic flux sine waves per linear cm (5,080 magnetic flux sine waves per linear inch) per track;

(iii) not including recording or reproducing heads designed for use in equipment with characteristics superior to those defined in (i) or (ii) above;

(iv) tape speed not exceeding 155 cm per second (61 inches per second);

(v) number of recording tracks (excluding audio voice track) not exceeding 28;

(vi) start-stop time not less than 25 milliseconds;

(vii) equipped with tape-derived (off-tape) servo speed control and with a time displacement (base) error, measured in accordance with applicable IRIG or EIA documents, of no less than .266 5 microsecond;

(viii) using only direct or FM recording;

(ix) not ruggedised for military use;

(x) not rated for continuous operation in ambient temperatures from below 233 K to above 328 K (from below –40°C to above +55°C); and

(xi) not specially designed for underwater use;

(d) (d) digital recording or reproducing equipment having all of the following characteristics–

(i) cassette/cartridge tape drives or magnetic tape drives which do not exceed–

(a) a maximum bit packing density of 131 bit per mm (3.300 bit per inch) per track; or

(b) a maximum bit transfer rate of 2.66 million bit per second;

(ii) not ruggedised for military use;

(iii) not specially designed for underwater use; and

(iv) not rated for continuous operation in ambient temperatures from below 233 K to above 328 K (from below –40°C to above +55°C);

(2) Recording or reproducing equipment using

laser beams, which produce patterns or images directly on the recording surface or reproduce from such surfacesA

except

(a) (a) when specially designed for the production of audio or video disk masters for the replication of entertainment– or education-type disks;

(b) (b) fascimile equipment such as used for commercial weather imagery and commercial wire photos and text;

(c) (c) consumer-type reproducers for audio or video disks employing non-erasable media;*or*

(d) (d) when specially designed for gravure (printing plate) manufacturing;

(3) Graphics instruments capable of continuous direct recording of sine waves at frequencies exceeding 20 kHzA

(4) Recording media used in equipment specified in (1) or (2) above ... ...A

( ) except

(a) (a) magnetic tape having all of the following characteristics–

(i) specially designed for television recording and reproduction or for instrumentation;

(ii) being a standard commercial product;

(iii) not designed for use in satellite applications;

(iv) in use in quantity for at least two years;

(v) a tape width not exceeding 25.4 mm (1 inch);

(vi) a magnetic coating thickness not less than–

(a) 2.0 micrometres (0.079 mil) if the tape length does not exceed 1,450 m (4,760 feet);*or*

(b) 5.0 micrometres (0.1975 mil) if the tape length does not exceed 6,000 m (19,710 feet);

(vii) a magnetic coating material consisting of doped or undoped gamma-ferric oxide or chromium dioxide;

(viii) a base material consisting only of polyester;

(ix) a rated intrinsic coercivity not exceeding 64 kA/m (804 oersted); and

(x) a retentivity not exceeding 0.16 T (1,600 gauss);

(b) (b) magnetic tape having all of the following characteristics–

(i) specially designed for television recording and reproduction or for instrumentation;

(ii) being a standard commercial product;

(iii) not designed for use in satellite applications;

(iv) in use in quantity for at least two years;

(v) a tape width not exceeding 50.8 mm (2 inches);

(vi) a magnetic coating material consisting of doped or undoped gamma-ferric oxide or chromium dioxide;

(vii) a rated intrinsic coercivity not exceeding 64 kA/m (804 oersted); and

(viii) a tape length not exceeding 1,096m;

(c) (c) video or audio magnetic tape in cassette having all of the following characteristics–

(i) specially designed for television or audio recording and reproduction;

(ii) being a standard commercial product;

(iii) a rated intrinsic coercivity not exceeding 120 kA/m (1,500 oersted);

(iv) a rententivity not exceeding 0.30 T (3,000 gauss);

(v) a tape length not exceeding 550 m; and

(vi) a magnetic coating thickness not less than 2.0 micrometres (0.079 mil);

(d) (d) computer magnetic tape having all of the following characteristics–

(i) designed for digital recording and reproduction;

(iii) a magnetic coating certified for a maximum “packing density” of 2,460 bit per cm (6,250 bit per inch) or 3,560 flux changes per cm (9,042 flux changes per inch) along the length of the tape;

(iii) a magnetic coating thickness not less than 3.6 micrometres (0.142 mil);

(iv) a tape width not exceeding 25.4 mm;

(v) a tape length not exceeding 1,100 m;

(vi) been in civil use for at least two years;

(vii) the base material consists only of polyester;

(e) (e) computer flexible disk cartridges having both of the following characteristics–

(i) designed for digital recording and reproduction and

(ii) not exceeding a gross capacity of 17 million bit;

(f) (f) rigid magnetic disk recording media having all of the following characteristics–

(i) being a standard commercial product;

(ii) non servo-written;

(iii) a packing density not exceeding 866 bit per cm (2,200 bit per inch);

(iv) not exceeding 80 tracks per cm (200 tracks per inch) and

(v) conforming to any of the following specifications–

(a) unrecorded single disk cartridges (front loading (2315-type)) designed to meet ANSI X3.52-1976;

(b) unrecorded single disk cartridges (top loading (5440-type)) designed to meet International Standard ISO 3562-1976;

(c) unrecorded six-disk packs (2311 type) designed to meet ANSI X3.46-1974 or International Standard ISO 2864-1974(E); or

(d) unrecorded eleven-disk packs (2316 type) designed to meet ANSI X3.58-1977 or International Standard ISO 3564-1976;

(5) Specially designed components, software and accessories for the equipment specified in heads (1) to (4) above (inclusive) ... ... A

In this entry–

"Recording media" means all types and forms of specialised media used in recording techniques, including but not limited to tapes, drums, disks and matrices.

"Recording density" for direct recorders means the recording bandwidth divided by the tape speed.

"Recording density" for FM recorders means the sum of the carrier frequency and the deviation divided by the tape speed.

"Packing density" for digital recorders means the number

	of bits per second per track divided by the tape speed.	
IL1573	Superconductive electromagnets and solenoids, of the following types–	
	(1) Those specially designed for gyrotron application having a non-uniform distribution of current-carrying windings, measured along the axis of symmetry, ...	A
	except when rated for magnetic induction of less than 1 tesla and having overall current density in the windings of less than 10,000 A/cmu22.	
	(2) Those specially designed to be fully charged or discharged in less than one minute and having all of the following characteristics–	
	(a) (a) the maximum energy delivered during discharge divided by the duration of the discharge being more than 500 kJ per minute;	A
	(b) (b) the inner diameter of the current-carrying windings being more than 6 cm; and	A
	(c) (c) being rated for magnetic induction of more than 8 tesla or for overall current density in the windings of more than 10,000 A/cmu22	A
	In this entry "overall current density" means the total number of ampere-turns in the coil (that is, the sum	

	of the number of turns multiplied by the maximum current carried by each turn) divided by the total cross-section of the coil (including the superconducting filaments, the metallic matrix in which the superconducting filaments are embedded, the encapsulating material and any cooling channels).	
IL1574	Electronic devices, circuits and systems specially designed for or capable of operation at temperatures below 103K (–170°C) and incorporating components manufactured from superconducting materials which perform functions such as electro-magnetic sensing and amplification, current switching, frequency selection or electromagnetic energy storage at resonant frequencies above 1 MHz, including but not limited to the following–	
	(1) Josephson-effect devices	A
	(2) Dayem bridges	A
	(3) Weak-link devices	A
	(4) Proximity-effect devices	A
	(5) Phase slip devices	A
	(6) SNS (super-normal-super) bridges	A
	(7) SIS (superconductor-insulator-superconductor) devices	A
	(8) Quasiparticle devices and detectors	A
IL1584	Cathode-ray oscilloscopes and specially designed components therefor including associated plug-in units,	

	external amplifiers, pre-amplifiers and sampling devices, having any of the following characteristics–	
	(1) An amplifier or system bandwidth greater than 250 MHz	A
	(2) A horizontal sweep faster than 1 nanosecond per cm with an accuracy (linearity) better than 2%	A
	(3) Incorporating or designed for use with cathode-ray tubes specified in the entry in Group 3F relating to electronic cathode-ray tubes	A
	(4) Ruggedised to meet a military specification	A
	(5) Rated for operation over an ambient temperature range of from below –25°C to above +55°C	A
	(6) Using sampling techniques for the analysis of recurring phenomena which increase the effective bandwidth of an oscilloscope or time domain reflectometer to a frequency greater than 4 GHz	A
	(7) Digital oscilloscope with sequential sampling of the input signal at an interval of less than 50 nanoseconds.	A
	In this entry “bandwidth” means the band of frequencies over which the deflection on the cathode-ray tube does not fall below 70.7% of that at the maximum point measured with a constant input voltage to the amplifier.	
IL1585	Photographic apparatus and film, the following–	
	(1) High speed cinema recording cameras and equipment, the following–	

(a) (a) cameras in which the film is continuously advanced throughout the recording period, and which are capable of recording at framing rates exceeding 13,150 frames per second, using any camera and film combination from the standard 8 mm to the 90 mm size (inclusive)	A
(b) (b) special optical or electronic devices which supplement, replace, or are interchangeable with, standard camera components for the purpose of increasing the number of frames per second	A
(2) High speed cameras in which the film does not move, and which are capable of recording at rates exceeding 1,000,000 frames per second for the full framing height of standard 35 mm wide photographic film, or proportionately higher rates for lesser frame heights, or proportionately lower rates for greater frame heights	A
(3) Cameras incorporating electron tubes specified in sub-head (3)(a) of the entry in Group 3F relating to electronic cathode-ray tubes, vacuum tubes or valves.	A
(4) Streak cameras having writing speeds of 10 mm per microsecond and above	A
(5) Camera shutters with speeds of, or greater than, 50 nanoseconds per operation and specially designed parts,	A

	components and accessories therefor	
	(6) Film, the following–	
	(a) (a) high speed film having–	
	(i) an intensity dynamic ratio of 1,000,000 to 1 or more; or	A
	(ii) a speed of ASA 10,000 (or its equivalent) or better	A
	(b) (b) colour film having a spectral sensitivity extending beyond 7,200 Angstrom or below 2,000 Angstrom	A
	(7) High speed plates having an intensity dynamic range of 1,000,000 to 1 or more	A
IL1586	Acoustic wave devices and specially designed components therefor, the following–	
	(1) Surface acoustic wave and surface skimming (shallow bulk) acoustic wave devices which permit the direct processing of signals, including but not limited to convolvers, correlators (fixed, programmable and memory), oscillators, bandpass filters, delay lines (fixed and tapped) and non-linear devices having any of the following characteristics–	A
	(a) (a) a carrier frequency of greater than 400 MHz;	
	(b) (b) a carrier frequency of 400 MHz or less (except such devices specially designed for domestic and entertainment purposes) having any	

	of the following characteristics– (i) a side-lobe rejection of greater than 45 dB; (ii) a product of the maximum delay time in microseconds and the bandwidth in MHz greater than 100; (iii) a dispersive delay of greater than 10 microseconds; or (iv) an insertion loss of less than 10 dB.	
	(2) Bulk (volume) acoustic wave devices which permit the direct processing of signals at frequencies greater than 1 GHz, including but not limited to fixed delay lines, non-linear and pulse compression devices	A
	(3) Acousto-optic signal-processing devices employing an interaction between acoustic waves (bulk wave or surface wave) and light waves which permit the direct processing of signals or images, including but not limited to spectral analysis, correlation or convolution In this entry “acoustic wave devices” means signal processing devices employing elastic waves in materials including but not limited to lithium niobate, lithium tantalate, bismuth germanium oxide, silicon, quartz, zinc oxide, aluminium oxide (sapphire), gallium arsenide and alpha-aluminium phosphate (berlinite).	A
IL1587	Quartz crystals having peizo-electric qualities, in worked, semi-finished or mounted form including assemblies, the following–	

(1) Filter elements having either of the following characteristics–		
	(a) (a) types designed for operation over a temperature range wider than 125°C; or	A
	(b) (b) types making use of the trapped energy phenomenon and having more than three series or parallel resonances on a single quartz element	A
	except those designed for operation as intermediate frequency filters operating from 10.5 to 11 MHz or from 21 to 22 MHz with 3 dB bandwidths not exceeding 40 kHz, or for operation as single sideband filters operating at from 1 to 10 MHz with 3 dB bandwidths not exceeding 4 kHz.	
(2) Oscillator elements specially designed for temperature-controlled crystal ovens or for temperature-compensated crystal oscillators described in head (3) of this entry and having an average ageing rate of of .26610u2–u29 per day or better		A
(3) Temperature-compensated crystal oscillators having any of the following characteristics–		
	(a) (a) a temperature stability of better than .2660.00015% over their operating temperature range;	A
	(b) (b) an operating temperature range wider than 120°C;	A

		(c) (c) capable of reaching to within 10u2–u27 of normal operating frequency or better in 3 minutes or less from switch-on at an ambient temperature of 25°C;	A
		(d) (d) rated to have an accelaration sensitivity of less than 10u2–u29 of the operating frequency per g (where g = 981 cm/secu22) over a vibration test frequency range from 10 to 2,000 Hz sine wave and with a maximum level of acceleration not exceeding 20 g;	A
		(e) (e) designed to withstand a shock greater than 10,000 g (where g = 981 cm/secu22) over a period of 1 millisecond; or	
		(f) (f) radiation hardened to better than 10u2–u21u20 of the operating frequency per gray (1 rad = 10u2–u22 gray)	A
	In this entry "ageing rate" shall be measured over a longer period at a constant temperature (within .266 2°C) of +60°C or more.		
IL1588		Materials composed of crystals having spinel, hexagonal, orthorhombic or garnet crystal structures, and thin film devices, the following–	
		(1) Monocrystals of ferrites and garnets (synthetic only)	A

(2) Single aperture forms possessing either of the following characteristics–	
(a) (a) switching speed of 0.3 microsecond or faster at the minimum field strength required for switching at 40°C; or	A
(b) (b) a maximum dimension less than 0.45 mm	A
(3) Multi-aperture forms with fewer than 10 apertures possessing either of the following characteristics–	
(a) (a) switching speed of 1 microsecond or faster at the minimum field strength required for switching at 40°C; or	A
(b) (b) a maximum dimension less than 2.54 mm	A
(4) Multi-aperture forms having 10 or more apertures	A
(5) Memory storage or switching devices, the following–	
(a) (a) thin film (including plated wire and plated rods) devices	A
(b) (b) single crystal or amorphous film magnetic bubble devices	A
(c) (c) moving domain devices	A
(d) (d) crosstie devices	A
(6) Magnetic ferrite materials having square loop characteristics, suitable for operating above 1 GHz and	A

	having all of the following characteristics	
	(a) (a) a saturation magnetisation of more than–	
	(i) 0.2 tesla for lithium-based ferrites; or	A
	(ii) 0.3 tesla for other ferrites	A
	(b) (b) a dielectric loss tangent of less than 0.001 measured at a frequency of 1 GHz or higher	A
	(c) (c) a ratio of the remanent magnetisation (Br) to the saturation magnetisation (4 Ms) not less than 0.7	A
	(7) Rod forms possessing either of the following characteristics–	
	(a) (a) a switching speed of 0.3 microsecond or faster at the minimum field strength required for switching at 40°C; or	A
	(b) (b) a minimum dimension less than 0.254 mm	A
	(8) Assemblies of, and devices incorporating, any of the items specified in heads (1) to (7) above (inclusive)	A
IL1595	Gravity meters (gravimeters), gravity gradiometers and specially designed components therefor, except gravity meters for land use having static accuracies of 100 microgal or less and land gravity meters of the Worden type	A

GROUP 3H

Note Goods specified in the heads of this Group may also be specified in Group 2 of this Part of this Schedule.

Metals, Minerals and their Manufactures

	In this Group, the following definitions apply– Crude forms Anodes, balls, bars (including notched bars and wire bars) billets, blocks, blooms, briquettes, cakes, cathodes, crystals, cubes, dice, grains, granules, ingots, lumps, pellets, pigs, powder, rondelles, shot, slabs, slugs, sponge, sticks; Semi-fabricated forms (whether or not coated, plated, drilled or punched)– Wrought or worked material fabricated by rolling, drawing, extruding, forging, impact extruding, pressing, graining, atomising and grinding, i.e. angles, channels, circles, discs, dust, flakes, foil and leaf, forgings, plates, powder, pressings and stampings, ribbons, rings, rods (including bare welding rods, wire rods and rolled wire), sections, shapes, sheets, strip, pipe and tube (including tube rounds, squares and hollows), drawn or extruded wire; (2) Cast material produced by casting in sand, die, metal, plaster or other types of moulds, including high pressure castings, sintered forms and forms made by powder metallurgy.	
IL1603	Seamless tubes and pipes having an outside diameter of 60 mm or more, and seamless fittings therefor, made	A

	of nickel-base superalloys containing the following major alloying elements, by weight: 19% or more of chronium, 7.4% or more of molybdenum, not more than 6% of iron, and 3% or more of niobium (columbium) or of niobium and tantalum combined	
IL1631	Magnetic materials, the following–	
	(1) Magnetic materials in all forms having any of the following characteristics–	
	(a) (a) initial permeability of 0.15 henry/m units (120,000 gauss/oersteds) or more calculated at induction 0 and magentic field strength 0 or the equivalent	A
	(b) (b) remanence 98.5% or more of maximum flux for materials having magnetic permeability	A
	or	
	(c) (c) a composition capable of an energy product of 200,000 joules/mu23 (25 x 10u26 gauss-oersteds) or more	A
	(2) Grain oriented iron alloy sheets or strips having a thickness of 0.1 mm or less	A
	(3) Magnetorestrictive alloys having either of the following characteristics–	
	(a) (a) saturation magnetorestriction more than 5 × 10u2–u24; or	A

	(b) (b) magnetomechanical coupling factor (K) more than 0.8	A
	(4) Amorphous alloy strips having both of the following characteristics–	A
	(a) (a) a composition having 75% or more of iron, cobalt or nickel, and	
	(b) (b) a saturation magentic induction of 1.6 tesla or more, with a strip thickness of 0.020 mm or less or electrical resistivity of 2 × 10u2–u24 ohm-cm or more.	
IL1635	Steels in crude or semi-fabricated forms containing a higher percentage of iron than of any element and not being products obtained by casting with a carbon content of more than 1.5%, the following–	
	(1) Steels containing 10% or more of molybdenum	A
	(2) Steels containing 5% or more of molybdenum together with 14% or more of chromium	A
	(3) Steel alloys containing a combination of the following major alloy elements in the amounts specified, by weight: 4.5 to 5.95% of nickel, 0.3 to 1.0% of chromium, 0.2 to 0.75% of molybdenum, 0.04 to 0.15% of vanadium and less than 0.19% of carbon	A
IL1648	Cobalt-based alloys containing a higher percentage of cobalt than of any other element and one or more of the following constituents in the proportions stated–	

	(1) 5% or more of tantalum; or	A
	(2) 1% or more of thorium, aluminium, yttrium, zirconium or cerium oxides; or.	A
	(3) 0.05% or more of rare earth metals	A
	in crude or semi-fabricated forms.	
IL1649	Niobium (columbium) based alloys containing 60% or more but not more than 99.3% of niobium, or having a combined content of 60% or more but not more than 99.3% of niobium-tantalum, in crude, semi-fabricated or scrap forms	A
IL1658	Molybdenum alloys containing not less than 97.5% or more than 99.9% of molybedenum, in crude or semi-fabricated forms, except wire	A
IL1661	Nickel alloys containing a higher percentage of nickel than of any other element and containing–	
	(1) 11% or more of aluminium and titanium combined; or	A
	(2) 1% or more of oxides of thorium, aluminium, yttrium, zirconium, cerium, or lanthanum; or	A
	(3) 0.05% or more of scandium, yttrium, didymium, cerium, lanthanum, neodymium or praseodymium	A
	in crude or semi-fabricated forms.	
IL1670	Tantalum, the following–	
	(1) Tantalum powder containing less than 200 parts per million of total metallic impurities	A
	(2) Sintered anodes fabricated from tantalum	A

	powder containing less than 200 parts per million of total metallic impurities	
	(3) Tantalum based alloys containing 60% or more of tantalum (except ferro-tantalum or ferro-tantalum-niobium containing 25% or more of iron or other metalloid elements), in crude or semi-fabricated forms or scrap	A
IL1671	Titanium based alloys in crude or semi-fabricated form or scrap, having nominal compositions of 6% aluminium, 2% tin, 4% zirconium, 6% molybdenum and the balance titanium	A
	In this entry the alloying compositions are nominal and may be subject to slight variations.	
IL1672	Aluminides of titanium containing 12% or more of aluminium by weight, and aluminides of nickel, cobalt and iron containing 10% or more of aluminium by weight, in crude or semi-fabricated forms, and scrap thereof	A
IL1674	Vanadium, including scrap, of a purity of 99.7% or higher and alloys containing vanadium, including scrap, of such purity as an alloying agent	A
IL1675	Superconductive materials of all types and processed conductors containing at least one superconducting constituent, designed for operation at temperatures below 103 K (–170°C)	A
	except processed conductors possessing all of the following characteristics–	
	(1) The superconducting constituent, when evaluated in sample length of less than 1 metre, does not remain in	

	the superconducting state when exposed to a magnetic induction in excess of 12 tesla at a temperature of 4.2 K (–268°C);	
	(2) The superconducting constituent or filament has a cross-section area greater than 3.14 × 10u2–u24 mmu22 or, in the case of circular filaments, a diameter greater than 20 micrometres;	
	(3) The superconducting filaments are included in a copper or copper-based matrix; and	
	(4) The conductor is either non-coated or insulated with varnish, glass fibre, polyamide or polyimide.	
—	Aluminium alloys, in which zinc predominates by weight over any other single alloying element in the following forms–	
	tubes, rods, forgings, bars and billets	A
—	Maraging steel alloy capable of ultimate tensile strength of 2.050 × 10u29 N/mu22 (300,000 pounds per square inch) or greater, whether or not finally heat-treated, in crude, semi-fabricated or fabricated form	A

GROUP 3I

Chemicals, Metalloids and Petroleum Products

IL1702	Hydraulic fluids containing as the principal ingredients petroleum (mineral) oils, synthetic hydrocarbon oils, non-fluorinated silicones or fluorocarbons and having all of the following characteristics–	A
	(1) A flash point of more than 477 K (204°C);	

	(2) A pour point of 239 K (–34°C) or lower;	
	(3) A viscosity index of 75 or greater; and	
	(4) Thermally stable at 616 K (+343°C).	
IL1715	Boron, boron compounds, mixtures and alloys, except pharmaceutical preparations packaged for retail sale, the following–	
	(1) Boron element (metal) in all forms	A
	(2) Boron compounds, mixtures and composites containing 5% or more of boron, the following–	
	(a) (a) non-ceramic boron-nitrogen compounds	A
	(b) (b) boron hydrides, except sodium boron hydride, potassium boron hydride, monoborane, diborane and triborane	A
	(c) (c) organoboron compounds including metallo-organoboron compounds	A
—	Boron compounds and mixtures in which the boron –10 isotope comprises more than 20% of the total boron content	A
IL1733	Base materials, non-composite ceramic materials, ceramic-ceramic composite materials and precursor materials for the manufacture of high temperature fine technical ceramic products, the following–	
	(1) Base materials, namely high purity fine powders	

with uniform particle-size distribution, the following–	
single or complex non-composite oxides, borides, carbides or nitrides of silicon, aluminium, boron, zirconium or tantalum	A
except	
(a) (a) single oxides of silicon, boron, aluminium or tantalum;	
(b) (b) single or complex borides of silicon; and	
(c) (c) single or complex borides or carbides of aluminium.	
(2) Non-composite ceramic materials, in crude or semi-fabricated form, having compositions of the base materials specified, other than as exceptions, in head (1) above	A
(3) Granular or fibrous ceramic-ceramic composite materials containing finely dispersed particles or phases of any non-metallic fibrous or whisker-like materials, whether externally introduced or grown in situ during processing, in which the following materials form the host matrix–	
(a) (a) all oxides, includes glasses	A
(b) (b) carbides or nitrides of silicon or boron	A
(c) (c) borides, carbides or nitrides of zirconium, hafnium or tantalum	A
(d) (d) carbon	A

	(e) (e) any combination of these materials	A
	(4) Precursor materials, namely special purpose polymeric or metallo-organic materials for producing any phase or phases of the materials specified in heads (2) or (3) above, the following–	
	(a) (a) polycarbosilanes and polydiorganosilanes, for producing silicon carbide	A
	(b) (b) polysilazanes, for producing silicon nitride	A
	(c) (c) polycarbosilazanes, for producing ceramics with silicon, carbon and nitrogen components	A
	In this entry, "high purity" means that a powder has a total metallic impurity, excluding intentional or desired additions, of less than 1000 ppm for single oxides or single carbides or less than 5000 ppm for complex compounds, single borides or single nitrides; and "fine powders with uniform particle-size distribution" means powders with at least 90% of the particles being not more than 10 micrometres and the average particle size not more than 5 micrometres. (For zircons, these limits are 5 micrometres and 1 micrometre respectively).	
IL1734	Low density, rigid, carbon-bonded fibrous or non-fibrous carbon thermal insulating	A

	materials having all of the following characteristics–	
	(1) a capability of operating at temperatures greater than 2273 K (2000°C);	
	(2) a density greater than 100kg/mu23 and less than 300kg/mu23;	
	(3) a compressive strength of greater than 0.1 MPa and less than 1.0 MPa;	
	(4) a flexural strength of greater than 1.0 MPa; and	
	(5) a carbon content of greater than 99.9% of total solids.	
IL1746	Polymeric materials and manufactures thereof, the following–	
	(1) Polyimides (including maleimides)	A
except the following forms: fully cured polyimide or polyimide-based film, sheet, tape or ribbon having a maximum thickness of 0.25 mm, whether or not coated or laminated with heat-sensitive or pressure-sensitive resinous substance of an adhesive nature, which contain no fibrous reinforcing materials and which have not been coated or laminated with carbon, graphite, metals or magnetic substances.		
	(2) Polybenzimidazoles	A
	(3) Aromatic polyamides, except staple fibres, filament yarns, chopped fibres, spun yarns or threads, having a fibre modulus of 0.022 Newtons per tex or less and a tenacity of 0.970 Newtons per tex or less, and pulp made from those materials	A
	(4) Polybenzothiazoles	A

	(5) Polyoxadiazoles	A
	(6) Polyphosphonitriles	A
	(7) Polystyrylpyridine	A
	(8) Thermoplastic liquid crystal copolyesters, the following–	
	(a) (a) ethylene copolyesters of terephthalic acid and parahydroxybenzoic acid	A
except manufactures thereof having both of the following characteristics–		
	(i) a tensile modulus of less than 15 GPa; and	
	(ii) specially designed for non-aerospace, non-electronic civil applications	
	(b) (b) phenylene or biphenylene copolyesters of terephthalic acid and parahydroxybenzoic acid	A
	(9) Polybenzoxazoles	A
	(10) Aromatic polyether ether ketones	A
	In this entry–	
	"tenacity" is the tensile stress expressed as force per unit linear density of the unstrained specimen, expressed in Newtons per tex;	
	"fibre modulus" is the ratio of change in stress to change in strain between two points on a stress-strain curve, viz the point of zero stress and the point of breaking stress expressed in Newtons per tex; and	

	"tex" is the number of grammes in 1,000 metres of material.	
IL1749	Polycarbonate sheet of a thickness between 1.5 mm and 25.4 mm (inclusive) having no major defects and having all of the following optical characteristics–	A
	(1) Less than 2% haze as determined by method ASTM D1003–	
	(2) An angular deviation, as determined by method ASTM D637–	
	(a) (a) of not more than 12 minutes at any location more than 25.4 mm from the edge of the sheet for sheet thickness of between 1.5 mm and 9.5 mm (inclusive); or	
	(b) (b) of not more than 20 minutes at any location more than 25.4 mm from the edge of the sheet for sheet thickness of more than 9.5 mm and not more than 25.4 mm;	
	(3) A total number of minor optical defects (excluding those within 25.4 mm of the sheet edge)–	
	(a) (a) not exceeding 1 per 0.368 mu22 for sheet of a thickness of 12.7 mm or less;	
	(b) (b) not exceeding 2 per 0.092 mu22 for sheet of a thickness of more than 12.7 mm.	
	In this entry "major defects" means variations in the material which	

cause angular deviations either side of the undeviated position exceeding those specified in head (2) and "minor defects" include any embedded particles, bubbles, scratches or internal inhomogeneity which reduce visibility through the plastic and those localised imperfections which cause a variation in angular deviation of more than 5 minutes within a distance of not more than 508 mm on the screen when tested by method ASTM D637.

IL1754 Fluorinated compounds, materials and manufactures, the following–

(1)

(a) Dibromotetrafluorethane, except dibromotetrafluoroethane having a purity of 99.8% or less and containing at least 25 particles each 200 micrometres or larger per 100 ml ... ... A

(b) Perfluoroalkylamines ... ... A

(2) Polymeric materials and intermediates, unprocessed, the following–

(a) Polychlortrifluoroethylene, oily and waxy modifications only A

(b) Fluoroelastomers composed of at least 95% of a combination of two or more of the monomers tetrafluoroethylene, chlorotrifluoroethylene, vinylidenefluoride,

	hexafluoropropylene and bromotrifluoroethylene, iodotrifluoroethylene, perfluoromethyl-vinylether and perfluoropropoxy-propylvinylether	
(c)	(c) Polybromotrifluoroethylene	A
(d)	(d) Copolymers of vinylidene fluoride having 75% or more beta crystalline structure without stretching	A
(e)	(e) Fluorinated silicone rubber and intermediates for their production containing 10% or more of combined fluorine	A
(3) Greases, lubricants and dielectric, damping and flotation fluids made of at least 85% of any of the materials listed in heads (1) and (2) above;		A
(4) Electric wire and cable coated with or insulated with any of the materials in (2)(b), except oil well logging cable;		A
(5) Seals, gaskets, rods, sheets, sealants or fuel bladders made of more than 50% of any of the materials in (2)(b) specially designed for aerospace and aircraft use;		A
(6) Piezoelectric polymers and copolymers made from vinylidene fluoride having both of the following characteristics–		A
(a)	(a) In sheet or film form; and	
(b)	(b) With a thickness of	

	more than 200 micrometres.	
IL1755	Silicone fluids and greases, the following–	
	(1) Fluorinated silicone fluids, except those with a kinematic viscosity of 5000 centistokes or more measured at 25°C	A
	(2) Silicone and fluorinated silicone lubricating greases capable of operating at temperatures of 180°C or higher and having a drop point of 220°C or higher	A
IL1757	Compounds and Materials, the following–	
	(1) Monocrystalline silicon, except metallurgical grade monocrystalline silicon having a purity not better than 99.97%	A
	(2) Gallium of a purity of 99.9999% or greater and gallium III/V compounds of any purity level, ...	A
	except	
	(a) (a) gallium phosphide; or	
	(b) (b) other gallium III/V compounds having a dislocation density (etch pit density – EPD) greater than 500,000 per cmu22;	
	(3) Indium of a purity greater than 99.9995% and III-V indium compounds containing more than 1% indium	A
	(4) Hetero-epitaxial materials consisting of a monocrystalline insulating sub-strate epitaxially layered with silicon, compounds of gallium or compounds of indium	A

(5) Elemental Cd and Te of purity levels of 99.9995% or greater, and CdTe compounds of a purity level of 99.99% or greater or single crystals of CdTe of any purity level	A
(6) Polycrystalline silicon, except polycrystalline silicon having a purity of 99.99% or less and containing at least 0.5 part in 10u26 each of iron, carbon, boron and phosphorus, plus other impurities	A
(See also the entry in Group 3D relating to equipment for the manufacture of electronic materials.)	
(7) Compounds used in the synthesis of the materials specified in head (6) above, having a purity level based upon the amount the primary constituent of 99.5% or better, or used as the silicon source in the deposition of epitaxial layers of silicon, silicon oxide or silicon nitride	A
This item includes SiCld22Hd22 having a purity level of 97% or more.	
(8) Single crystal sapphire substrates	A
(9) Bd22Od23 with a purity of 99.9% or greater, containing 1,000 parts per million of Hd22O or less, in powder or cast form	A
(10) Monocrystalline germanium with a resistivity greater than 100 ohm. cm.	A
(11) Resist materials having any of the following characteristics:	
(a) (a) negative resists with a spectral response adjusted for	A

		use below 350 nanometres	
	(b)	(b) for use with electron or ion beams with a sensitivity of 100 microcoulombs/cmu22 or better	A
	(c)	(c) positive resists	A
	(d)	(d) for use with X rays with a sensitivity of 500 millijoules/cmu22 or better; or	A
	(e)	(e) specified or optimised for dry development	A
		(12) Single-crystal forms of bismuth germanium oxide having piezo-electric properties and single-crystal forms of lithium niobate, of lithium tantalate and of aluminium phosphate	A
		(13) Metal-organic or hydride compounds of beryllium and magnesium, zinc, cadmium and mercury, aluminium, gallium and indium, phosphorus, arsenic and antimony and selenium and tellurium, having a purity (metal basis) of 99,999% or greater	A
IL1759		Syntactic foam for underwater use, the following–	
		(1) Syntactic foam formulated for applications at depths greater than 1,000 metres	A
		(2) Syntactic foam having a density of 0.561 g/cmu23 (35 lb/cu.ft.) or less	A
		In this entry– “syntactic foam” consists of hollow plastic or glass spheres less than 100 micrometres in diameter uniformly embedded in a resin matrix.	

IL1760	Compounds of tantalum and niobium (columbium), the following–	
	(1) Tantalates and niobates having a purity of 99% or more, except fluorotantalates	A
	(2) Other compounds containing 20% or more of tantalum in which the niobium content with respect of tantalum is less than 1 part per thousand	A
	This entry does not cover single-crystal lithium tantalate for which see the entry in this Group relating to compounds and materials.	
IL1763	Fibrous and filamentary materials suitable for use in composite structures or laminates, the following–	
	(1) having both of the following characteristics–	A
	(a) (a) specific modulus greater than 3.18 × 10u26m (1.25 × 10u28 in);	
	(b) (b) specific tensile strength greater than 7.62 × 10u24m (3 × 10u26 in); or	
	(2) having both of the following characteristics–	A
	(a) (a) specific modulus greater than 2.54 × 10u26m (1 × 10u28 in);	
	(b) (b) melting or sublimation point higher than 1,922 K (1,649°C) in an inert environment;	
	except	
	(i) carbon fibres having a specific modulus less than 5.08 × 10u26m (2 × 10u28 in) and a specific	

tensile strength less than 2.54 × 10u24m (1 × 10u28 in);

(ii) discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3% or more silica, having a specific modulus less than 10 × 10u26m (3.92 × 10u28 inches).

(3) Resin-impregnated fibres (prepregs) and metal-coated fibres (preforms) made with materials specified in heads (1) or (2) above	A
(4) Composite structures, laminates and manufactures thereof made either with an organic matrix or a metal matrix utilising materials specified in heads (1) and (2) above	A

In this entry–

"specific modulus" means Young's modulus in N/mu22 (lb force/sq.in) divided by specific weight in N/mu23 (lb force/cu.in), measured at a temperature of (296 .266 2) K ((23 .266 2)°C) ((73.4 .266 3.6)°F) and a relative humidity of (50 .266 5)%; and

"specific tensile strength" means ultimate tensile strength in N/mu22 (lb force/sq. in) divided by specific weight in N/mu23 (lb force/cu. in) measured at a temperature of (296 .266 2) K ((23 .266 2)°C) ((73.4 .266 3.6)°F) and a relative humidity of (50 .266 5)%.

IL1767	Preforms of glass, or of any other material, specially designed for the fabrication of optical fibres specified in head (2) of the entry in Group 3F relating to cable and wire	A
	In this entry "preforms" are defined as bars, ingots or rods, of glass, plastic or other materials, which have been specially processed for use in the fabrication of optical fibres.	
IL1781	Lubricating oils and greases, synthetic, which are or contain as their principal ingredient, the following–	
	(1) monomeric and polymeric forms of perfluorotriazines, perfluoroaromatic ethers and esters, and perfluoroaliphatic ethers and esters	A
	(2) polyphenyl ethers and thio ethers containing more than three groups of any of the following:	A
	(a) (a) phenyl;	
	(b) (b) alkyl phenyl;	
	(c) (c) phenyl and alkyl phenyl;	
—	Chemicals, the following–	
	(1) Chloreothanol	I
	(2) Dimethylamine	I
	(3) Dimethyl methylphosphonate	A
	(4) Dimethylphosphite	A
	(5) Hydrogen fluoride	A
	(6) Methyl phosphonyl dichloride	A
	(7) Methyl phosphonyl difluoride	A
	(8) Phosphorus oxychloride	A

	(9) Phosphorus trichloride	A
	(10) Potassium fluoride	I
	(11) Thiodiglycol	A
	(12) Trimethylphosphite	A
—	Synthetic rubbers, the following–	
	(1) Polymeric products of butadiene, the following:	
	(a) (a) carboxyl terminated polybutadiene, hydroxyl terminated polybutadiene, thiol terminated polybutadiene and cyclised 1, 2-polybutadiene	A
	(b) (b) mouldable copolymers of butadiene and acrylic acid	A
	(c) (c) mouldable terpolymers of butadiene, acrylonitrile and acrylic acid or any of the homologues of acrylic acid	A
	(2) Carboxyl terminated polyisoprene	A

GROUP 4

GOODS, TECHNOLOGIES AND PROCESSES IN RESPECT OF WHICH THE EXPORT OF TECHNOLOGICAL DOCUMENTS, OTHER THAN DOCUMENTS GENERALLY AVAILABLE TO THE PUBLIC, IS PROHIBITED TO ANY DESTINATION IN ANY COUNTRY SPECIFIED IN ARTICLE 2(iv)

IL1001	Technology for metal-working manufacturing processes and specially designed software, the following–
	(1) Technology for the design of tools, dies and fixtures specially designed for the following processes–
	(a) (a) hot die forging;
	(b) (b) superplastic forming;

(c) (c) diffusion bonding;

(d) (d) metal powder compaction using–

(i) vacuum hot pressing;

(ii) high pressure extrusion;

(iii) isostatic pressing;

(e) (e) direct-acting hydraulic pressing.

(2) Technical data consisting of the following process parameters–

(a) (a) for controlling hot die forging–

(i) temperature;

(ii) strain rate;

(b) (b) for controlling superplastic forming of aluminium alloys, titanium alloys and superalloys–

(i) surface preparation;

(ii) strain rate;

(iii) temperature;

(iv) pressure;

(c) (c) for controlling diffusion bonding of superalloys and titanium alloys–

(i) surface preparation;

(ii) temperature;

(iii) pressure;

(d) (d) for controlling metal powder compaction using vacuum hot pressing, high pressure extrusion or isostatic pressing–

(i) temperature;

(ii) pressure;

(iii) cycle time;

(e) (e) for controlling direct-acting hydraulic pressing of aluminium alloys for titanium alloys–

(i) pressure;

(ii) cycle time;

	(f) (f) for controlling hot isostatic densification of titanium alloys, aluminium alloys and superalloys– (i) temperature; (ii) pressure; (iii) cycle time.
IL1080	Technology, other than installation, operation and maintenance technology, for the use of the following equipment used in the manufacture of gas turbine blades or vanes– (1) Blade or vane belt grinding machines; (2) Blade or vane edge radiusing machines; (3) Blade or vane aerofoil milling or grinding machines; (4) Blade or vane blank preforming machines; (5) Blade or vane rolling machines; (6) Blade or vane aerofoil shaping machines, except metal removing types; (7) Blade or vane root grinding machines; and (8) Blade or vane aerofoil scribing equipment.
IL1372	Technology common to industrial gas turbine engines and gas turbine aircraft engines as specified in head (5) of the entry in Group 3E relating to technology for aircraft and helicopters, and technology common to industrial gas turbine engines and marine gas turbine engines.
IL1399	Technology for the design of automatically controlled industrial systems used with software as specified in the entry in Group 3D relating thereto, whether or not such other equipment or systems are specified.
IL1425	Technology relating to floating docks, the following– (1) That portion of the design of a floating dock specially designed for use at remote locations relating to the incorporation of the following facilities– (a) (a) welding and pipe fitting repair shops;

(b) (b) electrical and electronic repair workshops; and

(c) (c) mechanical repair or metal working machine shops; and

(2) The design, production and use of onboard floating dock facilities which permit the operation, maintenance and repair of nuclear reactors.

IL1460

Technology relating to aircraft and helicopters, the following–

(1) Technology for aircraft and helicopter airframes, for aircraft propellers, and for aircraft and helicopter airframe, aircraft propeller, and helicopter rotor systems components, and specially designed software therefor, the following–

(a) design technology using computer-aided aerodynamic analyses for integration of the fuselage, propulsion system and lifting and control surfaces to optimise aerodynamic performance throughout the flight regime of an aircraft;

(b) technology for the design of active flight control systems, the following–

(i) technology for configuration design for interconnecting multiple microelectronic processing elements (on-board computers) to achieve high-speed data transfer and high-speed data integration for control law implementation;

(ii) technology for control law compensation for sensor location and dynamic airframe loads (compensation for sensor vibration environment and for variation of sensor location from centre of gravity);

(iii) technology for electronic management of systems redundancy and data redundancy for fault detection, fault tolerance and fault isolation;

(iv) technology for design of flight controls which permit in-flight reconfiguration of force and moment controls;

(c) design technology for integration of flight control, navigation and propulsion control data into a flight management system for flight path optimisation;

(d) design technology for protection of avionic and electrical sub-systems against electro-magnetic pulse (EMP) and electromagnetic interference (EMI) hazards from sources external to the aircraft, the following–

(i) technology for design of shielding systems;

(ii) technology for the configuration design of hardened electrical circuits and sub-systems; and

(iii) determination of hardening criteria for the circuits and sub-systems specified in sub-head (d)(ii) above;

(e) technology for the design, production and reconstruction of adhesively bonded airframe structural members designed to withstand operational temperatures in excess of 120°C;

(f) technology for the design and production of propeller blades constructed wholly or partly of composite materials, and specially designed hubs therefor;

(g) technology for the design and production of digital electronic synchrophasers specially designed for propellers, technology for the design of digital electronic controls for propellers and technology for the production of digital electronic controls for the propellers specified in sub-head (f) above; and

(h) technology for the design and production of active laminar flow control lifting surfaces.

(i) technology for the development of helicopter multi-axis fly-by-night or fly-by-wire controllers which combine the functions of at least two

	of the following into one controlling element– (a) Collective controls (b) Cyclic controls (c) Yaw controls (j) technology for the development of circulation controlled anti-torque or directional control systems for helicopters; (k) technology for the development of helicopter rotor blades incorporating variable geometry airfoils; (l) technology for the development of active control of helicopter blades and other surfaces used to generate aerodynamic forces and movements. (2) Technology for helicopter power transfer systems, except data resulting from helicopter power transfer system performance and installation design studies, and fabrication technology or overhaul and refurbishment technology for specific helicopter power transfer systems in civil use in bona fide civil helicopters for more than 8 years. (3) Technology for gas turbine engines and auxiliary power units (APUs) for use in aircraft or helicopters, except data resulting from aircraft performance and installation design studies, and fabrication technology or overhaul and refurbishing technology for specific gas turbine aircraft engines or gas turbine powered aircraft APUs in civil use in bona fide civil aircraft or civil helicopters for more than 12 years.
IL1501	Technology, other than for installation, operation and maintenance, relating to the equipment specified in the exception to head 2(b) of the entry relating to navigation, direction finding, radar and airborne communication equipment.
IL1510	Technology or technical data associated with the design, manufacture or upgrading of an item not specified in IL1510 when such technology or technical data are also relevant to equipment specified in IL1510.
IL1519	Technology, other than for installation, operation or maintenance, relating to

	communication transmission equipment employing digital transmission techniques and designed for operation at a total bit rate at the highest multiplex point exceeding 2.1 Megabits per second.
IL1520	Technology, other than for installation, operation or maintenance, relating to radio relay communication equipment employing quadrature-amplitude-modulation (QAM) techniques.
IL1522	Technology, other than for installation, operation and maintenance, relating to uncooled, unsegmented mirrors with glass or dielectric substrates for use as end reflectors for laser resonators.
IL1537	Technology, other than for installation, operation and maintenance, relating to microwave assemblies, sub-assemblies or amplifiers (or combinations thereof) having all of the following characteristics– (1) Fixed tuned at the time of manufacture to operate only within the ITU satellite broadcasting band from 11.7 to 12.5 GHz; (2) Not capable of being retuned to a new frequency band by the user; and (3) Specially designed for use with or in civil television receivers.
IL1541	Technology for the design or production of cathode-ray tubes incorporating microchannel-plate electron multipliers.
IL1545	Technology unique to transistors based upon gallium arsenide.
IL1555	Technology for image intensifiers or converters incorporating fibre-optic face plates or microchannel-plate electron-multipliers, or electron tubes for cameras incorporating such intensifiers or converters.
IL1558	Technology relating to the equipment specified in the exception to the entry relating to electronic cathode-ray tubes, vacuum tubes and valves, specially designed for civil telecasting.
IL1560	Technology for the deisgn and production of tantalum capacitors rated for operation at ambient temperatures exceeding 125°C, except sintered electrolytic types having a casing made of epoxy resin or which are sealed or coated with epoxy resin.

IL1564	Technology relating to the export of wafer or chip design or processing information inherent in the manufacture of any class of "assembly", "module", "integrated circuit" or "circuit element", specified in this schedule irrespective of any release of devices in any of these classes. This restriction also applies to technology embodied both in the equipment specified in IL1355 and in its use.
IL1565	Technology relating to electronic computers, the following– (1) Technology applicable to the– (a) (a) development, production or installation, operation and maintenance of electronic computers of any kind, except (i) technology which is unique to related equipment specified in sub-heads (b)(iv)(a), (iv)(b), (iv)(c), (iv)(e), (iv)(f), (iv)(l), (iv)(n), (iv)(p), or (iv)(q) of head (7) of the entry in Group 3G relating to computers and does not relate to equipment specified elsewhere in this Schedule; and (ii) development, production or installation, operation and maintenance of equipment or systems specified in head (4) of the entry in Group 3G relating to computers. (2) Technology for the integration of– (a) (a) electronic computers or related equipment specified, other than as exceptions, in the entry in Group 3G relating to computers into other equipment or systems whether or not such other equipment or systems are so specified; or (b) (b) electronic equipment or related equipment not specified. other than as exceptions, in the entry in Group 3G relating to computers into other equipment or systems which are so specified.
IL1566	Technology applicable to the development, production or installation, operation and maintenance of software, whether or not such software is specified in this Schedule,

	except the minimum technical information necessary for the use of software not so specified other than as an exception.
IL1567	Technology applicable to the development, production or installation, operation and maintenance of stored-programme-controlled communication switching equipment or systems, whether or not the equipment or systems are specified in the entry in Group 3G relating thereto, except the minimum technical information necessary for the use of stored-programme-controlled communication switching equipment or systems not so specified, other than as exceptions.
IL1572	Technology, applicable to– (1) The development, production or use of recording or reproducing equipment specified in Group 3G except (a) (a) technology which is unique to equipment specified in the exceptions in sub-heads 1(a), (b), 2 or 3 to IL1572; (b) (b) the minimum technology necessary for the use of equipment which may be exported under the provisions as specified in Group 3G relating to recording or reproducing equipment. (2) Technology for continuous coating of magnetic tape as specified in Group 3G relating to recording media. except (a) (a) technology for the formulation of coating material; (b) (b) technology for the application of coating material to the backing. (3) Technology for the manufacture of flexible disk recording media as specified in Group 3G relating to recording media. except (a) (a) technology for the formulation of coating material;

	(b) (b) technology for the application of coating material to the flexible backing; (4) Technology for the development or production of rigid disk recording media as specified in Group 3G relating to recording media.
IL1584	Technology, other than for maintenance, repair and operation, relating to oscilloscopes not specified in head (1) of the entry in Group 3G relating to oscilloscopes, which– (1) Use cathode-ray tubes specified in head (2) of the entry in Group 3F relating to cathode-ray tubes, or (2) Exceed an amplifier bandwidth of 200 MHz.
IL1587	Technology for quartz crystal elements or assemblies not specified in head (1) of the entry in Group 3G relating to quartz crystals.
IL1595	Technology or technical data associated with the design, manufacture or upgrading of equipment not specified in the entry in Group 3 relating to gravity meters, when such technology or technical data is also relevant to equipment specified in the entry in Group 3 relating to gravity meters.
IL1601	The process of inert gas and vacuum atomising for achieving sphericity and uniform size of particles in metal powders.
IL1602	Pyrolitic deposition technology and specially designed components therefor, the following– (1) Technology for producing pyrolitically derived materials formed on a mould, mandrel or other substrate from precursor gases which decompose in the 1,537 K (1,300°C) to 3,173 K (2,900°C) temperature range at pressures of 133.3 Pa to 19.995 kPa, including the composition of precursor gases, flow rates and process control schedules and parameters; (2) Specially designed nozzles for the processes specified in head (1) above.

SCHEDULE 2

Article 10

The Export of Goods (Control) Order 1985 S.I. 1985/849.

The Export of Goods (Control) (Amendment) Order 1985 S.I. 1985/1085.

The Export of Goods (Control) (Amendment No. 2) Order 1985 S.I. 1985/1293.

The Export of Goods (Control) (Amendment No. 3) Order 1985 S.I. 1985/1294.

The Export of Goods (Control) (Amendment No. 4) Order 1986 S.I. 1986/82.

The Export of Goods (Control) (Amendment No. 5) Order 1986 S.I. 1986/540.

The Export of Goods (Control) (Amendment No. 6) Order 1986 S.I. 1986/1446.

The Export of Goods (Control) (Amendment No. 7) Order 1986 S.I. 1986/1934.

The Export of Goods (Control) (Amendment No. 8) Order 1987 S.I. 1987/215.

The Export of Goods (Control) (Amendment No. 9) Order 1987 S.I. 1987/271.

The Export of Goods (Control) (Amendment No. 10) Order 1987 S.I. 1987/1350.

EXPLANATORY NOTE

(This note is not part of the Order)

This Order revokes and replaces the Export of Goods (Control) Order 1985 and the subsequent amendments thereto. The changes (apart from minor and drafting changes) it effects are as follows–

1. Export control is–

(a) *lifted* on fluorotantalates

(b) *reduced* in scope on airborne, ground and marine navigation equipment, industrial transmitter and amplifier equipment, industrial telemetry and facsimile equipment, gyrotron electromagnets, magnetic materials, high-tensile aluminium alloys, fibrous and filamentary materials, electronic components.

(c) *extended in scope* on ballistic protection materials, plutonium, nuclear reprocessing equipment, tritium production equipment, submersible systems, deep submergence vehicles, diode waveguide components, microwave antennae, electronic integrated circuits, polymeric materials.

(d) *amended in scope* on deuterium, electronic measuring instruments, signal analysers, electronic components, polymeric materials, fluorocarbon compounds, compounds used in the synthesis of ultrafine polycrystalline silicon, resist material, certain ultra-pure metallo-organic and hydride compounds.

(e) *introduced* on neptunium, nuclear separation materials, certain secondary (regenerative) cells, molten salt cells, amorphous alloy strips, certain chemicals; and on specific technologies, in respect of which the export of technological documents is controlled to certain destinations, relating to automatically controlled industrial systems, wafer or chip design or processed information inherent in the manufacture of assemblies, modules, integrated circuits or circuit elements, inert gas and vacuum atomising process, radio relay communications equipment, laser resonators, micro-wave assemblies, sub-assemblies or amplifiers, cathode-ray tubes, gallium arsenide-based transistors, image intensifiers, recording or reproducing equipment, oscilloscopes, quartz-crystal elements, gravity meters.

2. The descriptions of goods subject to export control have been amended in respect of induction furnaces, primary cells, electric arc equipment, electronic circuit assemblies.

3. Frequency changers have been transferred from Group 3C to Group 2B.

4. Copies of the British Standards referred to in these Regulations may be obtained from any of the sales outlets operated by the British Standards Institution (BSI), or by post from the BSI at 3 Linford Wood, Milton Keynes, MK14 6LE. Copies of the economic and control rules of the International Cocoa Agreement can be obtained from the International Cocoa Organisation, 22 Berners Street, London W7.