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Air Vehicle Wing Production: Depth Classification Version of CC.
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[A depth classification version of CC for compound Subjects going with the Host Subject Air Vehicle Wing Production is given. The methodology for the design of freely-faceted scheme for classification has been used. A large number of the isolates constituting the different schedules for the classification of subjects going with each of the different Host Subjects for the production of the different parts and sub-assemblies of an aircraft — such as Wing, Fuselage, Nose cone, Control system, and Landing system — have common array divisions. Eight provisional schedules of such array divisions of isolates relevant to subjects in the field of aircraft production are presented and their use in the formation of isolate numbers illustrated with examples. The schedules of common array divisions given are: Directional relation, Location, Shape of edge, Attributes of surface, Shape (General), Mach Number, Range of dimension, and Material of construction. A provisional schedule of common organ isolates is also given. The Numerical Device is explained. The use of these devices help in conforming to the Canon of Helpful Sequence, the Canon of Consistent Sequence, the Canon of Scheduled Mnemonics, and the Law of Parsimony, in schedule building. In this way, the enumeration of isolates in the schedules has been reduced by about fifty percent. An Alphabetical Index to the schedules and a list of twelve examples of subjects classified according to the scheme for classification are given].

ABBREVIATIONS USED :

(BS) = Basic Subject	[IP1] = Personality Facet,
CC = Colon Classification	Round 1
(HS) = Host Subject	(QI) = Quasi Isolate
(IN) = Isolate Number	(SCC) = Schedule for Common
(MM) = Matter (Method) Isolate	Array Division
(ND) = Numerical Device	

0 Introduction**01 SERIES**

This paper is one of a series demonstrating the construction of a depth classification version of CC for subjects going with the (HS) Aircraft Production Engineering. An aircraft is a composite machine. Many of its component parts are produced separately. The production of an aircraft consists essentially of the proper assembly of the various components. It is, therefore, a convenience if depth classification versions of CC for subjects going with each of the different (HS) such as Wing Production Engineering, Fuselage Production Engineering, Nose Cone Production Engineering, Control Surfaces Production Engineering, Propulsion System Production Engineering, and Landing System Production Engineering, are constructed. For several of the (QI) and isolates of these schedules can be used in the design of the depth classification version of CC for subjects going with the (HS) Aircraft Production Engineering, because any kind any special organ such as those mentioned above may be used as qualifiers in the schedule for a whole aircraft. It will help to conform to the Canon of Helpful Sequence, the Canon of Consistent Sequence, the Canon of Scheduled Mnemonics, and the Law of Parsimony in schedule building. In this paper, a provisional depth classification version of CC for subjects going with the (HS) Air Vehicle Wing Production Engineering is given.

1 Methodology of Design**11 FREELY FACETED CLASSIFICATION**

The methodology for the design and development of a freely faceted scheme for classification has already been described (3, 5). It has been found helpful in the design of several depth versions of CC for subjects going with different (BS). This methodology for design has been used here.

12 SOURCE OF ISOLATES

In addition to comprehensive treatises and micro documents such as articles in periodicals, and technical reports pertaining to aeronautical engineering, the following schemes for classification and thesauri have also been used extensively in the present work.

- 1 ASLIB, AERONAUTICAL GROUP, CLASSIFICATION (Working Party on—). Aero/Space engineering classification. A bibliographic classification on UDC principles on aeronautical and astronautical engineering. (Aircraft, Missiles, Rockets, and Space Vehicles). 1960. (Mimeographed).
- 2 UNIVERSAL DECIMAL CLASSIFICATION for 532.5 and 533.6. Fluid motion, hydrodynamics, and aerodynamics, with alphabetical index. (Incorporating all official amendments upto and including those given in extensions and corrections to the UDC Series, 5, N 1, Feb 1963).

- 3 CLEVERDON (C) and others. ASLIB Cranfield research project. Factors determining performance of indexing systems. 1966. 1-V; Design, Part 2; Appendices.
- 4 ROYAL AIRCRAFT ESTABLISHMENT (Cranfield). [Schedule for aeronautics] (mimeographed).
- 5 NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS, (Washington DC), RESEARCH INFORMATION (Division of—). Index to NACA technical publications, June 1954 to May 1965. v-viii.
- 6 AIR INDIA INTERNATIONAL. [Schedule for Aeronautics]. (1964) (Typed).
- 7 FEDERAL AVIATION AGENCY, LIBRARY SERVICE (Division), INFORMATION RETRIEVAL (Branch). Thesaurus of FAA descriptors. Ed 2. 1965.
- 8 UNITED STATES DEFENCE, (Department of—), NAVAL RESEARCH (Office of—), PROJECT LEX, and ENGINEERS JOINT COUNCIL. Thesaurus of engineering and scientific terms. 1967.
- 9 BS 185:1962-5. BRITISH STANDARDS INSTITUTION. Glossary of aeronautical terms. 1962-5.

13 Depth Versions of CC

The following are some of the depth classification versions of CC for subjects in aeronautical engineering and propulsion systems used or consulted in the preparation of the present schedules.

- 1 RANGANATHAN (T) and NEELAMEGHAN (A). Air vehicle wing production: Depth classification. (Annual seminar, (DRTC). 4;1966; Paper P).
- 2 RANGANATHAN (S R). [An unpublished draft scheme for the classification of subjects going with the (BS) Aeronautics] (c1961).
- 3 RANGANATHAN (T). [Aircraft production engineering: A scheme for depth classification.]. 1967. (Unpublished).
- 4 ANJANEYULU (V). Production engineering of missile: Depth classification. (Annual seminar, (DRTC). 3;1965; Paper K).
- 5 RANGANATHAN (T). Production engineering of gas turbine engine: Depth classification. (Annual seminar, (DRTC). 2;1964; Paper 1-4).
- 6 VASUDEVA RAO (K N). Chemical rocket engine production: Depth classification. (Annual seminar, (DRTC). 4;1966; Paper Q).

2 Host Subject

21 DEFINITION

211 *Air Vehicle*

An air-supported vehicle

212 *Aircraft*

An air-supported heavier-than-air vehicle.

213 *Wing*

In relation to an aircraft, a wing is a flat or a slightly cambered plate. It is symmetrical about a median plane. Compared to its other dimensions, such as length and width, its thickness is very small. The function of the wing is to provide the lifting force enabling the heavier-than-air vehicle to fly.

AIR VEHICLE WING PRODUCTION: DEPTH CLASSIFICATION C31

WING AS (IP1) ISOLATE

In our earlier article (6), the helpfulness of classifying and arranging the documents on Air Vehicle Wing Production Engineering in close juxtaposition to the documents on the production engineering of some of the other components specific to aircraft and also to the documents dealing with the production engineering of the aircraft itself, has been discussed. In CC the Main Subject Engineering has been divided into a few canonical (BS). One such (BS) is "D8 Commodity Production Engineering". It has been found convenient to deem the subject Air Vehicle Wing Production Engineering as going with the (BS) Commodity Production Engineering. The isolate "Wing" can be derived on the basis of the characteristic "By Commodity". Thus, the subject Air Vehicle Wing Production Engineering may be represented by the following (HS):

Commodity Production Engineering (BS), Air vehicle wing [IP1]

3 First Characteristics

The first characteristics — that is, (Q1) in [IP1] — are given in Table 1 in Sec 31. The sequence among the characteristics has been determined using the Group Strategy.

31 TABLE 1. QUASI ISOLATES IN [IP1].

SN	Sector	Quasi Isolate
<i>a</i>	<i>b</i>	<i>c</i>
1	(S — (A))	By Designation of wing
2	(S — (a))	By Predicted life of wing
3-8	(S — Z ())	By Air vehicle in which used
3	(S — ZA)	By Make
4	(S — Za)	By Purpose
5	X	By Speed
6	T	By Altitude
7-8	KZ	By Propulsion system
7	P	By Number
8	L	By Kind
9-23		By Spatial property of wing
9	ZO	By Part of wing affected
10	Z	By Shape of wing
11-17		[Special (Q1) for camber]
11	G	By Thickness/chord ratio
12	F	By Thickness
13	E	By Tip chord
14	D	By Root chord

a	b	c
15	C	By Chord
16	B	By Extent of deviation from chord
17	A	By Position of maximum mean camber from leading edge
18	Z	By Attribute of wing surface
19	Zy	By Shape of edge
20	Za	By Wing area
21	Zw	By Wing span
22	Zv	By Wing width
23	Zt	By Aspect ratio
24-49	(S - Za) (S - A)	By Wing design factor
24-49		Aerodynamic attributes of air foil
24	ZpZ	By Cutout and fitting
25-33		By Wing load factor
25	Zk	By Total wing load
26	Zj	By Ultimate design load
27	Zh	By External airload during normal cruise
28	Zg	By Total wing load during 2-5 g maneuver
29	Zf	By Wing dead weight
30	Ze	By Net shear load to fuselage
31	Zd	By Gust load
32	Zc	By Maneuver load
33	Zb	By Load distribution
34	X	By Nusselt number
35	W	By Prandtl number
36	V	By Reynold's number
37-38	T	By Laminar flow
37	TB	By Full chord flow
38	TA	By Boundary layer
39	S	By Maximum value of C_L/C_D
40	R	By Moment coefficient at zero lift C_{m0}
41	Q	By Ratio C_{Lmax}/C_{Lmix}
42	P	By Minimum drag coefficient C_{Dmin}
43	N	By Maximum lift coefficient C_{Lmax}
44	M	By Maximum lift curve slope ($\times 100$ per degree)
45	L	By Maximum value of C_L/C_{D2} (for ceiling)
46	K	By Ratio C_L/C_D at $C_L = 0.7$ (for climb)
47	J	By Value of C_L for maximum profile drag
48	H	By Value of C_L for maximum C_L/C_D
49	C	By Wing profile drag
50	(S - 9Zf)	By Construction of wing
51-53	v)	By Support to wing box
51	9Z	By Construction of skin
52	9Zw	By Material
53	9Zv	By Thickness
54-56		By Kind of construction
54	9Zh	By Construction of beam
55	9Zg	By Kind of construction
56	9Ze	By Material
57-59		By Thickness
57	9Zc	By Construction of web
		By Number

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a	b	c
58	9Zb	By Material
59	9Za	By Sheet thickness
60-68		By Wing box
60	9S	By Material of top of wing box
61	9N	By Dimension
62-63		By Wing root
62	9K	By t/c
63	9J	By Taper rate
64-65		By Wing tip
64	9F	By t/c
65	9E	By Taper rate
66-67		By Bottom of wing box
66	9C	By Material
67	9B	By Taper ratio
68		By Rib of wing
68	9IA	By Material
69-74	(S — 9a)	By Attributes of leading edge
69-71		By Kind
69	9r	By Mach number
70	9p	By Shape
71	9m	By Slating
72-74		By Construction
72	9k	By Material
73	9d	By Thickness
74	9c	By Bevel-edge angle
75-79	(S — zZa)	By Attributes of trailing edge
75-76		By Kind
75	(S — 0A)	By Mach number
76	(S — 0a)	By Shape
77-78		By Construction
77	zA	By Skin construction
78	zZx	By Angle of trailing edge
79	zZb	By Tab
80-106	(S — zA)	By Attributes of control surfaces
	(S — a)	
	(S — zA)	
80-88		By Flap
80	zX	By Number
81	zV	By Location
82	(zR — zU)	By Kind
83	zP	By Material
84	(zM — zN)	By Length
85-86		By Chord
85	zK	By Kind
86	zJ	By Percentage
87	zG	By Angle of setting
88	zF	By Angle of deflection
89-91		By Hinge
89	zE	By Number
90	zD	By Material
91	zC	By Kind of bearing
92-102	(S — za)	By Aileron
92	zv	By Number per wing
93	zt	By Kind

a	b	c
94	zs	By Material
95	zr	By Chord ratio
96	zn	By Shape
97	zm	By Surface
98	zk	By Shape of edge
99	zj	By Location
100	zg	By Thickness of edge
101-102	zb	By Attributes of hinge
101	zd	By Kind
102	ze	By Material
103-107		By Spoiler
103	x	By Number
104	v	By Kind
105	t	By Material
106	r	By Shape
107	p	By Direction
108-112		By Suction slot
108	k	By Number
109	h	By Shape
110	g	By Direction
111	f	By Spacing
112	e	By Method of operation

4 Design of Schedules

41 ARRAY DIVISION

An examination of the isolates constituting the different schedules for the classification of subjects going with each of the different (HS) for the Production Engineering of the different components of an aircraft, indicated that many of the isolates have common components in array of order 1, or 2 or later orders. Therefore, if schedules of common divisions are prepared, they can be conveniently used for the formation of isolates in the different schedules. This will help in conforming to the Canon of Helpful Sequence, the Canon of Consistent Sequence, the Canon of Scheduled Mnemonics, and the Law of Parsimony, in the design and development of schemes for the depth classification of subjects going with the different (HS) mentioned in Sec 01. With this in view, a few Schedules for array division of Isolates (SCC) have been prepared (See Sec 6). In Table 2 in Sec 411, examples of their use in the formation of (IN) in the scheme for the classification of subjects going with the (HS) Air Vehicle Wing Production Engineering are given.

411 Table 2. Use of the Schedules of Common Array Divisions

SOC	Example of Array Divisions	Example of formation of (IN)			Other causes in the schedule
		1	2	3	
1	<i>Directional relation</i>	8	p	By Direction of spoiler	
	<i>suction slot</i>				
j	Lateral				
j1	Chordwise	g1	p1	Chordwise	
j2	Spanwise	g2	p2	Spanwise	
2	<i>Location</i>	z	Z	By Surface of wing affected	
06	Under	z06	Z06	Under surface	
0H	Upper	z0H	Z0H	Upper surface	
96	Internal	z96			
9B	External	z9B			
3	<i>Shape of edge</i>	0	9p	By Shape of leading edge	zk
c	Sharp	0c	9pc	Sharp	
e	Twisted				
i	Blunt	0j	9pj	Blunt	Zz _e Twisted
i2	Bluffed				Zz _i Blunt
m	Drooped	0m	9pm	Drooped	Zz _{i2} Bluffed
4	<i>Attributes of surface</i>	zm	Z	By Wing surface	
zB	Smooth	zmB	ZzB	Smooth	
zJ	Slotted	zmJ	ZzJ	Slotted	
zM	Drilled	zmM	ZzM	Drilled	

SCC	Example of Airtry Divisions	Example of formation of (IN)			Other cases in the schedule	
		1	2.	3		
5	Shape (General)	h	By Shape of spoiler	Z	By Shape of wing	zn
	0n Triangular	r	By Shape of spoiler	Z0n	Triangular	
	0s2 Rectangular	r0n	Triangular			
	0t Polygon	r0s2	Rectangular			
	0zt Cambered			Z0zt	Cambered	
6	Mach Number	9r	By Mach Number for training edge	X	By Aircraft speed	
	D Transonic	9rD	Transonic	XD	Transonic	
	E Supersonic	9rE	Supersonic	XE	Supersonic	
	G Hypersonic	9rG	Hypersonic	XG	Hypersonic	
7	Dimension	9J	By Wing root taper rate	C	By Wing profile drag	Zp
	D Small, Low	9JD	Low	CD	Low	
	F Medium, Moderate	9JE	Moderate	CE	Medium	
	F Large, High	9JF	High	CF	High	
8	Material of construction	t	By Material of spoiler	9k	By Material of leading edge	zP, 9C, 9S, 9Zb, 9Zg, 9Z0
	C2 Carbon steel	tC2	Carbon steel			
	C5 Manganese steel	tC5	Manganese steel	zC5	Manganese steel	
	C6 Nickel steel					
	F Aluminium alloy	tF	Aluminium alloy	zCR5	Molybdenum alloy	
	R5 Molybdenum alloy					

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In the schedules, a note such as "Division by SCC-3" is given under the appropriate (IN). The use of the schedules of common array divisions in the formation of (IN) has resulted in reducing enumeration of isolates in the schedules by about 50 percent.

42 NUMERICAL DEVICE

In a large number of cases (about fifty in the schedules presented in this paper) an isolate is conveniently divided in the basis of an Unit of Measure. In each of such cases it is convenient to suffix the data for the measure as given in the document to the appropriate (IN) given in the schedule. The component thus added is read as given in the document. If the component added consists of two parts as in the case of a decimal fraction, the digits representing the two parts are connected by an "=" (equal to sign). This is similar to the use of this indicator digit in Alphabetical Device in the case of multinomials (1, 2). This device for the formation of the (IN) is provisionally named as Numerical Device (ND). It has been used extensively in the formation of (IN) during the last four years.

In the present schedules, the units of measure are given in the CGS system, which is taken as the favoured system. However, if the FPS system or any other system is used as the Favoured System, the (ND) can be used in a similar manner. If the (IN) are to be formed on the basis of a less favoured system also, the digit 'B' is to be interpolated between the (IN) given in the schedule and the component digits for the unit of measure added to it.

Example

9c <i>By Thickness</i> (in cm)	C <i>By Length of Chord</i> (in metres)
9c2 2 cm	C2 2 metres
9c3 3 cm	C2=4 2.4 metres
9c3=5 3.5 cm	C3=1 3.1 metres
9c4=1 4.1 cm	CB6=1 6'1"
9cB2 2 inches	CB7=3 7'3"
9cB2=6 2.6 inches	CB7=5=1 7'5.1"

In the schedules, under the appropriate isolates the note "Division by (ND)" is given.

43 COMMON ORGAN ISOLATES

About 1965, while designing schemes for the depth classification of subjects going with the (BS) D8 Commodity Production Engineering, it was found that

1 Certain kinds of "Organ" are common to many commodities; Examples of such common organs are:

Edge, tip, depression, cavity, hole, kink, and connection.

2 A schedule of Common Organ Isolates should be Constructed; and

3 Wherever warranted the organ isolates should be taken from the schedule of Common Organ Isolates.

A provisional list of such organ isolates is given in Sec 7.

44 (MP), (E) AND (2P) ISOLATES

The schedules presented in this paper are largely confined to the isolates in [1P1].

441 (MP) Isolates

A short schedule of aerodynamic properties in relation to air vehicle wing is given. The schedule of Common Property Isolates (4) has also been used in classifying.

442 (E) Isolates

The schedule of Common Energy Isolates (unpublished) has also been used in classifying.

443 (MM) Isolates

A set of (Q1) for the (MM) isolate "I Wind tunnel" associated with the (E) isolate "fR Testing" is given.

The above-mentioned schedules are expected to be developed more fully as and when the depth classification versions of CC for the different subjects in aircraft production mentioned in Sec 01 are worked out.

45 NOTATION

The sectors allocated to the schedules of (1P1) isolates are indicated in column (b) in Table I in Sec 31.

Some of the canonical (BS) going with the Main Subject D Engineering are as follows:

- D Engineering
- D6 Power production
- D7 Service production
- D8 Commodity production

A few of the relevant (1P1) isolates derived on the basis of the characteristic "By Commodity" for subjects going with the (BS) Commodity Production Engineering are as follows:

- 961 Airframe
- 96B Air vehicle wing
- 96C Fuselage

Thus, the Host Class Number for Air Vehicle Wing Production Engineering will be: D8,96B

46 MNEMONICS

To facilitate the use of mnemonics, wherever convenient, letters of the Roman Alphabet have been equated with the digits of the Hindu-Arabic numerals according to the following scheme:

b = B = 1 f = F = 5 k = K = 91 q = P = 95
 c = C = 2 g = G = 6 m = L = 92 r = Q = 96
 d = D = 3 h = H = 7 n = M = 93 s = R = 97
 e = E = 4 j = J = 8 p = N = 94 t = S = 98

5 Index to Schedules

- 24S-T alloy (SCC-8), F2
 75S-T alloy (SCC-8), F7
 Above (SCC-2), 0G
 Abrupt (SCC-3), c1
 Across (SCC-1), j3
 Adjacent (SCC-2), 0h
 Administrative air vehicle [1P], Zw
 Aerodynamics
 [1MP], z1
 irt Design [1P], B
 Aeroelasticity [1MP], 0B
 Aeroisoclinic (SCC-5), 0x
 Aerothermochemistry [1MP], z4
 Afterbody (Org) [1P], m
 Ahead (SCC-2), 0P
 Aileron [1P], za
 Org [1P], 932
 Air
 breathing engine [1P], L1
 flow variable [1MP], 0D
 load in normal cruise [1MP], 0Zh
 [1P], Zh
 vehicle [1P], Z()
 Alfaro flap [1P], zU1
 Along (SCC-1), m2
 Aluminium (SCC-8), E
 alloy (SCC-8), F
 Altitude *irt* Air vehicle [1P], T
 Ambient (SCC-2), 0t
 Angle
 Bevel-edge *irt* Leading edge [1P],
 9c
 of attack [2P1], z
 deflection *irt* Flap [1P], zF
 setting *irt* Flap [1P], zb
 trailing edge [1P], zZA
 Angular (SCC-1), d
 irt Bend (SCC-5) 0g3
 Annular ring (SCC-5), 0zb7
 Anti—
 clockwise (SCC-1), gb
 ice device [1P], Zc
 (Org) [1P], 9D2
 submarine air vehicle [1P], Zh
 Apex (Org) [1P], gj
 Arc (SCC-5), 0e1
 discharge wind tunnel [2P1], Fk
 Area
 rule [1MP], 0k1
 Wing [1P], Zx
 Arrow (SCC-5), 0s35
 Aspect ratio [1P], Z1
 At (SCC-1), m4
 Attack, Angle of [2P1], z
 Automatic suction slot [1P], e6
 Away (SCC-1), m5
 Axial (SCC-1), c
 loading *irt* Wing box [1P] 9Zn1
 Axis (SCC-2), 2
 Axisymmetrical (SCC-5), 011
 Backward (SCC-1), m7
 sweep (SCC-5), 0mH
 Balanced
 aileron [1P], ztD
 flap [1P], zR
 tab [1P], zZd
 Base (Org), [1P], dg
 Beam
 Construction of [1P], 9Zd
 (Org) [1P], 143
 Bearing
 irt Hinge of flap [1P], zB
 (Org) [1P], zk
 Bed (Org) [1P], de
 Behind (SCC-2), 0R
 Below (SCC-2), 02
 Bent (SCC-5), 0g
 Between (SCC-2), 9m
 Bevel edge angle *irt*
 Leading edge [1P], 9c
 Bevelled (SCC-3), v
 Beyond (SCC-2), 0f
 Biconvex (SCC-5), 0zp
 Bisector (SCC-2), 22
 Blind hinge [1P], zd6

- Blow down wind tunnel [2P1], FB
 Bluffed (SCC-3), j1
 Blunt (SCC-3), j
 Boat-tailed (SCC-3), s
 Bomber [1P], Ze
 Bottom (Org) [1P], d
 of wing box [1P], 9A
 Boundary layer [1MP], 0j
 irt Design [1P], TA
 Bow (Org) [1P], jb
 Brace (Org) [1P], 15
 Bracing, External [1P], 9ZB
 Brake (Org) [1P], 935
 Breakaway flow [1MP], 0g
 Breast-high (SCC-2), 0B
 Bump (SCC-4), zwm
 (Org) [1P], wm
 Buried (SCC-2), 08
- C_L for maximum
 C_L/C_D
 irt Design [1P], H
 [1MP], 0zH
 profile drag [1P], J
- C_L/C_D
 at $C_L \sim 0.7$
 [1MP], 0zK
 irt Design [1P], K
 Maximum value of [1MP], 0zc
 irt Design [1P], s
- $C_{L_{max}}/C_{D_{min}}$
 [1MP], 0zQ
irt Design [1P], Q
- C_{L3}/C_{D2}
irt Design [1P], L
 Maximum value of [1MP], 0zL
- Caliper hinge [1P], zdm
 Camber
 Differentiated
 schedule for [1P], Z0zrl
 Position of mean [1P], A
 Cambered (SCC-5), 0zr
 Cantilever [1P], 9ZD
 Canvas, Doped (SCC-8), 7
 Carbon steel (SCC-8), C2
 Casing (Org) [1P], 2
 Cavity (SCC-4), zxm
 (Org) [1P], xm
 Cell construction [1P], 9Zr
 Central (SCC-2), 1
 Centreline (SCC-2), 21
 Central (SCC-2), 0Z
 Centrifugal (SCC-1), f3
 Centripetal (SCC-1), f6
 Ceramics (SCC-8), X
 Chemical rocket engine [1P], LK
 Chord *irt* Camber [1P], C
- Flap [1P], zH
 Percentage of *irt* Flap [1P], d
 ratio *irt* Aileron [1P], zr
 Chordwise (SCC-1), j1
 load distribution [1P], Zb11
 variable load
 distribution [1P], Zb41
- Chromium
 alloy (SCC-8), R2
 molybdenum steel (SCC-8), CE
 vanadium steel (SCC-8), CM
- Circular (SCC-5), 0zb
 arc (SCC-5), 0z3
 Circumferential (SCC-2), 54
 Circumjance (SCC-2), 0r
 Civilian air vehicle [1P], Zzp
 Clipped (SCC-3), k2
 Close spacing *irt* Suction slot
 [1P], f1
- Closed
 box *irt* wing box [1P], 9Zq
 wind tunnel [2P1], FM
 Coaxial (SCC-1), e5
 Cobalt base alloy (SCC-8), J
 Columbian alloy (SCC-8), R3
 Commercial air vehicle [1P], Zzm
 Component (Org) [1P], ea
 Compressibility effect [1MP], z5
- Concave (SCC-5), 0zn
 Concentric (SCC-2), 13
 Conical (SCC-5), 0zF
 Conjugated *irt* Wing box [1P], 9Zf
 Connection (Org) [1P], y
 Constant
 chord *irt* Flap [1P], zK7
 diameter shock tube [2P1], BF
- Construction of
 beam [1P], 9Zd
 skin of wing box [1P], 9Zv
 web [1P], 9Y
 wing box [1P], 9X
- Contiguous (SCC-2), 0j
 Continuous wind tunnel [2P1], FF
 Control
 mechanism (Org) [1P], 93
 surface [1P], c
- Controlled tab [1P], zZf
 Convergent (SCC-5), 071
 Convex (SCC-5), 0zm
 Coplanar (SCC-4), zm
 Copper alloy (SCC-8), P
 Core (Org) [1P], nb
 Corner (Org) [1P], yb
 Corrugated (SCC-4), zwc
 Corrugation (Org) [1P], we
 and double skin [1P], 9Z2
 and single skin [1P], 9Z1

Counter
 direction (SCC-1), m8
 measure air vehicle [1P], Zg
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 Coupling, Inertia [1MP], 09r
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 horn flap [1P], zR13
 True contour flap [1P], zS6
 Truncated (SCC-3), k4
 Trunk (Org) [1P], f
 Tungsten (SCC-8), RC
 Turbo
 jet [1P], L75
 ramjet [1P], L76
 Turnover hinge [1P], zdF
 Twisted (SCC-3), e
 Two
 cell *irt* Wing box [1P], 9Zr2
 concentrated *irt* Wing
 box [1P] 9Zm2
 dimensional (SCC-5), 0j
 spar bracing [1P], 9ZB2

 Ultimate design load [1P], Zj
 Uncambered (SCC-5), 0zs
 Under (SCC-2), 0b
irt Wing surface [1P], ZD6
 Undersurface (Org) [1P], rb
 Uniaxial (SCC-1), e1
 Unidirectional (SCC-1), b1
 Uniform load distribution
 [1P], Zbl

- Unscreened horn flap [1P], zR16
 Unsteady motion [1MP], 09c4
 Unwept (SCC-5), 0mk
 Untapered (SCC-3), db
 Up (SCC-1), pl
 Upper *irt* Wing surface [1P], Z0t
 Upstream (SCC-1), r1
 Utility air vehicle [1P], Zv
- V shape (SCC-5), 0nV
 Vanadium (SCC-8), RD
 Variable
 load distribution [1P], Zb4
irt Camber [1P], BD
 Varying
 along span *irt*
 Sweep (SCC-5), 0mp
 Thickness of leading edge
 [1P], 9d
 cross-section *irt* Wing box
 [1P], 9Zk
 flange *irt* Wing box [1P], 9Zm
 Venetian blind flap [1P], z185
 Vertical plane (SCC-2), 0l
 Very
 high (SCC-7), Ca
 large (SCC-7) G
 low (SCC-7), C
 small (SCC-7), C
- W shape (SCC-5), 0nW
 Waist (Org) [1P], yj
 Wake [1MP], 0F
 Wavy (SCC-4), zF
 Web construction [1P], 9Y
 Webbed [1P], 9ZH
 Wedge (SCC-5), 0zD8
- Weight, Dead [1P], Zj
 West (SCC-1), zj
 Whole (Org) [1P], b
 Wide
 chord *irt* Flap [1P], zK3
 spacing *irt* Suction
 slot [1P], f3
 Width of
 shock tube [2P1], Bc
 wind tunnel [2P1], Fc
 wing [1P], Zv
 Wind tunnel [2P1], F
 Windward (SCC-1), t2
 Wing
 body combination [1MP], 0X
 box [1P], 9l
 design factor [1P], A
 load in 2.5 g maneuver
 [1MP], 0R
 profile drag *irt* Design [1P], C
 root [1P], 9H
 shape [1P], Z
 surface [1P], Z
 tip affected [1P], Z
 tip [1P], 9D
 Within [SCC-2], 9c
 Wood (SCC-8), 2
 Wrinkled (SCC-4), zG
- X shape (SCC-5), 0nx
 Yawing moment [1MP], 0b
- Z shape (SCC-5), 0nZ
 Zap flap [1P], zU2
 Zero lift [1MP], 0zR
irt Design [1P], R

6 Common Divisions for Isolates (SCC)

61 SCC-1: DIRECTIONAL RELATION

- | | | | |
|----|----------------------|-----|---------------------|
| a | Spatial Relation | g | Rotary |
| b | Directional relation | g1 | Clockwise |
| b1 | Unidirectional | g6 | Anti-clockwise |
| b8 | Multidirectional | g8 | Counter-rotation |
| c | Parallel | j | Lateral, Transverse |
| d | Angular | j0 | Side |
| d1 | Inclined | j01 | Right |
| d2 | Gradient | j05 | Left |
| e | Axial | j1 | Chordwise |
| e1 | Uniaxial | j2 | Spanwise |
| e5 | Coaxial | j3 | Across |
| e8 | Multiaxial | j5 | Equatorial |
| f1 | Radial | m | Longitudinal |
| f3 | Centrifugal | m1 | Edgewise |
| f6 | Centripetal | m2 | Along, Past |
| | | m3 | Forward |

AIR VEHICLE WING PRODUCTION: DEPTH CLASSIFICATION C63

m4	Toward. At	0F	High
m5	Away	0G	Above, over
m6	Reverse. Counter	0H	Upper
m7	Backward	0J	Overhang
p1	Up	0K	Perpendicular
p2	Down	0N	Horizontal plane
p3	Incoming	0P	Ahead. Front
p5	Outgoing	0Q	Leading
p6	Through	0R	Behind. Rear
p8	Tangential	0S	Following
r	Streamwise	0T	Horizontally
r1	Upstream	0V	Plane
r2	Downstream	0X	Level
t1	Leeward	0Z	Centricity
t2	Windward	1	Central
zA	Orientation	11	Midpoint
zB	East	12	Midplane
zF	South East	13	Concentric
zG	South	14	Eccentric
zH	South West	15	Off-centre
zJ	West	2	Axis
zM	North West	21	Centreline
zN	North	22	Bisector
zP	North East	23	Median
		3	Inboard
		5	Peripheral
62	SCC 2: LOCATION	51	Fringe
0a	Location	53	Outboard
	General	54	Circumferential.
0b	Located. Present	9b	Internal. Inner
0c	Distant	9c	Within. In
0d	Isolated	9d	Outer. External
0e	Removed	9e	Outside
0f	Beyond	9f	Margin
0g	Near	9g	Limit
0h	Adjacent	9h	Interface. Interplane
0j	Contiguous	9m	Between
0k	In contact	9m1	Interlayer
0k8	Tangential	9m2	Interstage
0m	On	9m3	Interangular
0p	Joined	9m4	Intersection
0q	Entering	9m5	Junction
0r	Circumjance	9m6	Node
0s	Environment	9zh	Tip. Extreme. End
0t	Ambient		
0v	Surround	63	SCC 3: SHAPE OF EDGE
0x	Spanning	h	Shape of edge
01	Vertical plane	c	Sharp
02	Below	c1	Abrupt
03	Deep	d	Pointed
033	Low	d1	Crisp
04	Shallow level	d2	Tapered
06	Under	d5	Multitapered
07	Submerged	d6	Untapered
08	Buried	e	Twisted
0B	Breast high	f	Reflexed. Folded
0C	Middle	g	Rounded

j	Blunt	0e1	Arc
jl	Bluffed	0e2	Sinusoidal
k	Cut	0g	Bent
k1	Cropped	0g3	Angular
k2	Clipped	0g5	Orthogonal
k4	Truncated	0i	Two-dimensional
m	Drooped	0k	Rectilinear
p	Extended	0k1	Planiform
p1	Elongated	0m	Swept
p2	Flared	0mD	Forward (°)
p3	Skirted		Note:- Use (ND).
p5	Stretched	0mH	Backward (°)
r	Hammerhead		Note:- Use (ND).
s	Boat-tailed	0mP	Varying along span
v	Bevelled	0mK	Unswept
64	SCC-4: ATTRIBUTES OF SURFACE	0n	Triangular
za	Attribute of surface	0n1	Equilateral
zb	Smooth	0n2	Isosceles
zc	Rough	0n3	Delta (Caret)
zk	Flat	0n32	Double
zm	Planar	0n36	Reverse
zp	Coplanar	0n5	Nonweiler
zq	Non-planar	0nH	H
zs	Isotropic	0nI	I
	Note.— <i>The following divisions are mnemonic with "w Prominence to xp Cut-out" in the "Schedule of Common Organ Isolates" in [1P].</i>	0nM	M
zw	Prominence	0nT	T
zwb	Projection	0nV	V
zwd	Protrusion	0nV6	Inverted V
zwe	Corrugated	0nW	W
zwf	Wavy	0nX	X
zwj	Toothed	0nY	Y
zwm	Bumped	0nZ	Z
zwn	Spiked	0p	Lambda
zwp	Lobed	0q	Theta
zwr	Stepped	0s	Quadrangular
zvw	With ridge	0s2	Rectangular
zx	Depression	0s21	Square
zxb	Cracked	0s23	Parallelogram
zxf	Grooved	0s24	Rhomboid
zxc	Perforated	0s26	Sextic
zch	Holed, Slotted	0s28	Trapezoid
zck	With gap	0s3	Diamond
zxm	With cavity	0s32	Double wedged
zxp	Cut out	0s34	Modified
zxr	Drilled	0s35	Arrow
65	SCC 5: SHAPE	0t	Polygon
0a	Shape	0t5	5 sided
0b	One-dimensional	0t6	6 sided (Hexagon)
0c	Straight	0t8	8 sided (Octagon)
0d	Out-of straight	0t94	12 sided (Dodecagon)
0e	Curved	0v	Cruciform
		0x	Aeroisoclinic
		0za	Curvilinear
		0zb	Circular
		0zb6	Non circular
		0zb7	Annular ring
		0zc	Horseshoe

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		(MACH NUMBER)
Ozd	Crescent	B Subsonic (upto 0.9)
Oze	Cranked	C Sonic
Ozf	Gulling	D Transonic (0.91-1.5)
Of	Fan	E Supersonic (1.51-4.0)
Ozm	Convex	F High supersonic (4-15.0)
Ozn	Concave	G Hypersonic (5.1-15.0)
Ozp	Biconvex (Lenticular)	H Re-entry (over 15)
Ozt	Cambered	67 SCC 7: RANGE OF DIMENSION
Ozs	Uncambered	B Infinitesimal
Ozt	Fusiform	C Very small. Very low
Ozu	Oval (Elliptical)	D Small. Low
Ozu2	Half	E Medium, Moderate
Ozv	Parabolic	F Large, High
Oz1	Recti-curved	G Very large, Very High
Oz2	Semicircular	68 SCC 8: MATERIAL OF CONSTRUCTION
Oz3	Circular arc.	2 Wood
Oz5	Ogee	21 Spruce
Oz6	Gothic	7 Doped convass
Oz61	Parabolic gothic	B Metal
Oz7	Hyperbolic	
Oz8	Hypeliptic	T1 (A2) into (A1) begins
OzA	Three dimensional	C Steel alloy
OzB	Faceted	C1 Stainless steel
OzC	Octahedral	C2 Carbon steel
OzD	Prismatic	C3 Free cutting carbon steel
OzD7	Pyramidal	C5 Manganese steel
OzD8	Wedge	C6 Nickel steel
OzE	Cylindrical	C8 Nickel-chromium steel
OzF	Conical	CB Inconel
OzF2	Quasi-conical	CD Molybdenum steel
OzF3	Spiked	CE Chromium-molybdenum steel
OzF4	Tori-conical	CH Nickel-chromium molybdenum steel
OzG	Helical	CM Chromium vanadium steel
OzH	Spiral	CP Silicon manganese steel
OzK1	Spheroid	E Aluminium
OzK2	Oblate	F Aluminium alloy
OzK3	Prolate	F2 24S-T
OzK4	Hemi-spherical	F7 75S-T
OzK5	Torispherical	G Nickel base alloy
OzK6	Spherical	H Manganese alloy
OzM	Ellipsoidal	J Cobalt base alloy
OzM2	Semi-ellipsoidal	M Titanium alloy
OzN	Ogival	P Copper alloy
OzP	Skewed	R Refractory group
OzR	Toroidal	R2 Chromium alloy
OzS	Paraboloidal	R3 Columbian alloy
O1	Symmetrical	R5 Molybdenum alloy
O11	Axi-symmetrical	R6 Platinum group
O16	Non-axisymmetrical	T (A3) into (A2) begins
O6	Non-symmetrical	RB Tantalum
O7	Cross-sectional	RC Tungsten
O71	Convergent	
O74	Divergent	
O7D	Thin	
O7F	Thick	
66	SCC 6: AIRCRAFT SPEED	

RD	Vanadium	V	Reinforced plastics
	T (A3) into (A2) ends	W	Refractories
	TI (A2) into (A1) ends	X	Ceramics

7 Schedules

71 (1P) ISOLATES

Schedule of Common Organ Isolates

b	Whole
c	Part
ca	Component
cb	Element
cc	Sample
cd	Specimen
ce	Piece
cf	Factor
cg	Fraction
cj	Section
ck	Slice
cm	Sector
cp	Segment
d	Bottom
da	Foundation
dc	Foot
de	Bed
dg	Base
dm	Leg
f	Trunk
fb	Stem
g	Top
ga	Peak
gc	Head
ge	Crown
gg	Crest
gi	Apex
j	Forepart
jb	Bow
jd	Nose
m	Afterbody
n	Interior
nb	Core
nd	Kernel
nf	Centre
p	Face
pb	Outerwall
pd	Surface
r	Membrane
rb	Undersurface
re	Layer
rh	Interface
s	Envelope
sb	Covering
sd	Lining

l	Extremity
th	Edge
v	Ridge
vb	Rim
vd	Lip
ve	Tip
vh	End
w	Prominence
wb	Projection
wd	Protrusion
we	Corrugation
wf	Excrescence
wg	Ridge
wj	Tooth
wm	Bump
wn	Spike
wp	Lobe
wr	Obstacle
x	Depression
xb	Notch
xd	Crack
xf	Groove
xg	Perforation
xh	Hole
xx	Gap
xm	Cavity
xp	Cut out
y	Connection
yb	Corner
yd	Kink
ye	Neck
yg	Throat
yh	Knee
yj	Waist

Telescoping point
Earlier level

(S — za) General Purpose
Machine Element (=ME)

Note.— *Division as in the schedule of Machine Elements in [1P1] for subjects going with the (BS) Commodity Production Engineering.*

(Illustrative)

za	Machine element
zb	Mechanical element
zc	Fastener
zc3	Screw
zc4	Nut

AIR VEHICLE WING PRODUCTION: DEPTH CLASSIFICATION C71

zk	Bearing	n	By Attributes of spoiler
	<i>Telescoping point</i>		T2 (A3) into (A1) begins
	<i>Earlier level</i>	p	By Direction
1	Support		Note.— Division by SCC-1
11	Prime box		
12	Structural panel	r	By Shape
143	Beam		Note.— Division by SCC-5
15	Internal brace		
151	Stiffener	t	By Material
152	Spar		Note.— Division by SCC-8
153	Rib		
186	Nacelle		By Kind
2	Casing	v1	Cover type (plate)
27	Skin	v6	Plug type
3	Fastening mechanism		
3B	Hinge	x	By Number
93	Control mechanism		Note.— Division by (ND)
932	Aileron		T2 (A3) into (A1) ends
933	Flap		
934	Spoiler	za	By Attributes of aileron
935	Brake		
936	Tab		T3 (A3) into (A1) begins
9D	Protection device	zb	By Attributes of hinge of aileron
9D2	Anti-ice		
9D5	Fly-warding	zc	T1 (A4) into (A1) begins
	<i>Telescoping point</i>		By Material
	<i>Earlier level</i>		Note.— Division by SCC-8
B	Leading edge	zd	By Kind
D	Trailing edge	zd1	Hook-and-eye
		zd2	Strap
	<i>Earlier level</i>	zd3	H
c	BY ATTRIBUTES OF CONTROL SURFACE	zd4	T
		zd5	Flap
		zd6	Blind
d	T1 (A2) into (A1) begins	zdB	Skew
	By Attributes of suction slot	zdD	Gate
		zdF	Turn-over
e	T1 (A3) into (A1) begins	zdH	Fast joint
	By Method of operation	zdJ	Sliding
e1	Fixed	zdM	Caliper
e2	Manual		
e6	Automatic	ze	By Number
f	By Spacing		Note.— Division by (ND)
f1	Close		T1 (A4) into (A1) ends
f3	Wide	zg	By Thickness of edge of aileron (in cm)
			Note.— Division by (ND)
g	By Direction		
	Note.— Division by SCC-1		
h	By Shape	zj	By Location
	Note.— Division by SCC-5		Note.— Division by SCC-2
k	By Number		
	Note.— Division by (ND)	zk	By Shape of edge
	T1 (A3) into (A1) ends		Note.— Division by SCC-3

zm	By <i>Surface</i> Note.—Division by SCC-4	zK3 Wide zK7 Constant T3 (A4) into (A1) ends
zn	By <i>Shape</i> Note.—Division by SCC-5	By <i>Length of flap</i> zM In relation to wing span (%) zM0 Full span Note.—Other (IN) to be derived by (ND)
zr	By <i>Chord ratio (%)</i> Note.—Division by (ND)	(Illustrative) zMS9 59 per cent zM66 66 per cent zN In metres Note.—Division by (ND)
zs	By <i>Material</i> Note.—Division by (SCC-8)	zP By <i>Material of flap</i> Note.—Division by SCC-8
zt	By <i>Kind</i>	By <i>Kind of flap</i>
zt1	Friese	zR Balanced
zt2	Semi-span	zR1 Horn
zt3	Feeler (guide)	zR13 Triangular
zt5	Flap	zR15 Screened
zt6	Floating	zR16 Unscreened
ztD	Balanced	zR2 Shrouded
ztF	Spoiler-slot	zS1 Plain
ztH	Retractable (spoiler-aileron)	zS3 Dive
ztK	Slot-lip	zS4 Extension
ztM	Plug type	S5 Recovery
zv	By <i>Number per wing</i> Note.—Division by (ND) T3 (A3) into (A1) ends	zS6 True contour zS7 Straight contour zT6 Split zT8 Slotted zT82 Double zT85 Venetian blind
zA	By <i>Attributes of Flap</i> T4 (A3) into (A1) begins	zU1 Alfaro
zB	By <i>Hinge of flap</i> T2 (A4) into (A1) begins	zU2 Zap
zC	By <i>Kind of bearing</i>	zU3 Fowler
zC1	Plain	zU4 Jet
zC5	Roller	zU5 Rotating
zD	By <i>Material of hinge</i> Note.—Division by SCC-8	zU6 Oscillating
zE	By <i>Number of hinges</i> Note.—Division by (ND) T2 (A4) into (A1) ends	zV By <i>Location</i> zV1 Leading edge-located zV3 Trailing edge-located zV5 External foil-located
zF	By <i>Angle of deflection of flap</i> Note.—Division by (ND)	zX By <i>Number of flaps</i> Note.—Division by (ND) T4 (A3) into (A1) ends T1 (A2) into (A1) ends
zG	By <i>Angle of setting of flap</i> Note.—Division by (ND)	
zH	By <i>Chord</i> T3 (A4) into (A1) begins	
zJ	By <i>Percentage of chord</i> Note.—Division by (ND)	zZa BY ATTRIBUTES OF TRAIL- ING EDGE
zK	By <i>Kind of chord</i> _	T2 (A2) into (A1) begins

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zZb	By Tab	T1 (A3) into (A2) begins By Material of rib Note.— Division by SCC-8
	T5 (A3) into (A1) begins	T1 (A3) into (A2) ends
zZd	Balanced	
zZe	Link	
zZf	Controlled	
zZj	Servo	9A By Botton of wing box
zZm	Spring	
zZp2	Geared	
	By Construction	9B By Taper ratio
zZx	By Angle of trailing edge	Note.— Division by (ND)
	Note.— Division by (ND)	9C By Material
		Note.— Division by SCC-8
zZ	By Construction	
	Note.— Divide as "9Z By kind of construction of skin of wing" (Illustrative)	9D By Wing tip
zZ91	Singic skin and corrugation	T7 (A3) into (A1) begins
zZ97	Reveled	9E By Taper rate
		Note.— Division by SCC-7
	By Kind of trailing edge	9F By t/c
0	By Shape	Note.— Division by (ND)
	Note.— Division by SCC-3	T7 (A3) into (A1) ends
0	By Mach number	
	Note.— Division by SCC-6	9H By Wing root
9b	BY ATTRIBUTES OF LEADING EDGE	
	T3 (A2) into (A1) begins	9J By Taper rate
	By Construction	Note.— Division by SCC-7
9c	By Bevel-edge angle	
	Note.— Division by (ND)	9K By t/c
9d	By Thickness (in cm)	Note.— Division by (ND)
	Note.— Division by (ND)	T8 (A3) into (A1) ends
9e	Varying along span	
9k	By Material	9M By Top of wing box
	Note.— Division by SCC-8	
	By Kind of leading edge	T9 (A3) into (A1) begins
9n	By Slatting	
9n1	Slatted	9N By Dimension (in cm.)
9n6	Non-slattd	Note.— Division by (ND)
9p	By Shape	
	Note.— Division by SCC-3	9S By Material of top of wing box
9r	By Mach number	Note.— Divide using SCC-8
	Note.— Division by SCC-6	T9 (A3) into (A1) ends
	T3 (A2) into (A1) ends	
91	BY WING BOX	9X By Construction of Wing box
91A	By Rib	

- T5 (A2) into (A1) begins*
9Y *By Construction of web*
- T6 (A2) into (A1) begins*
9Za *By Sheet thickness*
Note.— Division by (ND)
- T6 (A2) into (A1) begins*
9Zw *By Thickness of skin (in cm)*
Note.— Division by (ND)
- T6 (A2) into (A1) begins*
9Zb *By Material of web*
Note.— Division by SCC-8
- T6 (A2) into (A1) begins*
9ZD *By Material of skin*
Note.— Division by SCC-8
- T6 (A2) into (A1) begins*
9Zc *By Number of webs*
Note.— Division by (ND)
- T6 (A2) into (A1) begins*
9Z0Z *By Kind of construction of skin*
- 9Z1** Single skin and corrugation
9Z2 Double skin and corrugation
9Z3 Honeycomb with two skins
9Z5 Thick plate with stringers
9Z6 Machined grid
9Z7 Riveted
9Z8 Sculptured plate
T6 (A2) into (A1) ends
- T10 (A3) into (A1) begins*
9Zc *By Thickness (in cm)*
Note.— Division by (ND)
- T6 (A2) into (A1) ends*
9ZA *By Support to wing box*
- T6 (A2) into (A1) ends*
9Zg *By Material of beam*
Note.— Division by SCC-8
- T6 (A2) into (A1) ends*
9Zh *By-Kind of construction*
- T4 (A3) into (A1) begins*
9Zj I-Section
9Zk Varying cross-section
9Zk1 Straight
9Zk3 Curved
9Zm Varying flange
9Zm1 One-concentrated
9Zm2 Two-concentrated
9Zm3 Three-concentrated
9Zn1 With axial loading
9Zm8 Eccentric loading
9Zp Conjugated
9Zq Closed box
- T7 (A2) into (A1) begins*
9ZB External bracing
9ZB2 Two spar
9ZD Full cantilever
9ZD1 Drag truss
9ZF Monocoque
9ZG Semi-monocoque
9ZH Webbed
9ZJ Rigid
9ZK Sagging
T7 (A2) into (A1) ends
- A** BY WING DESIGN FACTORS
- T8 (A2) into (A2) begins*
B *By Aerodynamic attributes of airfoil*
- T11 (A3) into (A1) begins*
C *By Wing profile drag*
Note.— Division by SCC-7
- T11 (A3) into (A1) begins*
H *By Value of C_L for maximum C_L/C_D*
- T11 (A3) into (A1) begins*
J *By Value of C_L for maximum profile drag*
- T11 (A3) into (A1) begins*
K *By Ratio C_L/C_D at $C_L = 0.7$ (for climb)*
- T11 (A3) into (A1) begins*
L *By Maximum value of C_L^3/C_D^2 (for ceiling)*
- T1 (A5) into (A1) begins*
9Zr Cell
9Zr1 One
9Zr1Z Multiple
9Zr2 Two
9Zr3 Three
9Zr4 Four
9Zr5 Five
T1 (A5) into (A1) ends
T4 (A4) into (A1) ends

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M	By Maximum lift curve slope ($\times 100$ per degree)	Za3	Inflatable rubber bladder
N	By Maximum lift coefficient	Zs4	Hot leading edge
P	By Minimum drag coefficient	Zt	By Spatial Property
Q	By Ratio C_{Lmax}/C_{Dmin}	ZtD	By Aspect ratio
R	By Moment coefficient at zero lift C_{m0}	ZtF	Low (Less than 6)
S	By Maximum value of C_{L}/C_{D}	ZtM	High (6 and above)
T	By Laminar flow	ZtN	Finite
TA	By Boundary layer		Infinite
TB	By Full chord flow	Zv	By Wing width (in meters)
V	By Reynolds number	Zw	Note.— Division by (ND)
W	By Prandtl number	Zx	By Wing span (in meters)
X	By Nusselt number	Zy	Note.— Division by (ND)
	T11 (A3) into (A1) ends	Zz	By Wing area (in m^2)
Za	By Wing load factor		Note.— Division by (ND)
	T12 (A3) into (A1) begins	Z	By Shape of edge
Zb	By Load distribution		Note.— Division by SCC-3
Zb1	Uniform		By Attribute of wing surface
Zb11	Chordwise		Note.— Division by SCC-4
Zb12	Spanwise	Zz ()	(Differentiated schedule for attributes of camber)
Zb13	Spanwise-chordwise	A	By Position of maximum mean camber from leading edge (in tenths of chord)
Zb4	Variable		Note.— Division by (ND).
Zb41	Chordwise	B	By Extent of deviation from chord (%)
Zb42	Spanwise		Note.— Division by (ND).
	Note.— In forming (IN) derived on the basis of each of the (Q1) "By Manoeuver load" to "By Ultimate design load", the given figure is to be divided by 1000 before using (ND).	BD	In addition, the following (IN)
Zc	By Manoeuver load	BD	Variable
Zd	By Gust load	BG	Negative
Ze	By Net shear load to fuselage	BH	Positive
Zf	By Wing dead weight	C	By Chord (in meters)
Zg	By Total wing load during 2.5g maneuver	D	By Root chord (in metres)
Zh	By External airload during normal cruise	E	By Tip chord (in meters)
Zj	By Ultimate design load	F	By Thickness (in meters)
Zk	By Total wing load (g/cm^2)	G	By Thickness/Chord ratio (%)
	T12 (A3) into (A1) ends		Note.— Division of (IN)
ZpZ	By Cutout and fitting		C to G by (ND).
Zq	Nacelle		2 Superimpose (IN) derived according to Note 1, as required, and place the resulting compound isolate within the circular brackets in Zz().
Zq1	Fuselage		(Illustrative)
Zq2	Engine	Z0zr-Zz(C1=-5-A0=4)	Cambered wing, Chord 1.5 meters, Maximum mean camber 0.4c
Zq3	Passenger carrier		
Zr	Dust and fly warding device	Z	By Shape of Wing
Zr1	Dust		Note.— Division by SCC-5
Zr5	Fly		
Zs	Anti-ice device		

Z	By Part of wing affected	Zzm	Commercial
Z06	Under	Zzp	Civilian
Z0H	Upper	Zzv	Military
Z1)	WHICH WING IS USED	ZA	By Make
Z1)	BY AIR VEHICLE IN		Note.— Division by (AD)
KZ	By Propulsion system		(Illustrative)
	By Kind	ZB	Boeing
L	Internal combustion engine	ZD	Douglas
L1	Air breathing		Note.— To construct the
L2	Reciprocating		(IN) for "Air Vehicle", super-
L5	Rotary		impose (IN) from ZD to 1 in
L58	Gas turbine		the above schedule as required
L7	Reaction engine (Jet)		and place the compound isolate
L72	Ramjet		within brackets in Z().
L73	Pulsejet		(Illustrative)
L75	Turbojet	Z(ZD-Zf-L7)	Douglas, Fighter,
L76	Turbo-ramjet		Jet aircraft
L8	Non-air breathing		
LH	Reaction engine		
LJ	Rocket	'a)	BY WING LIFE (in 1000 hr)
LK	Chemical rocket	(b)	Safe life
LM	Nuclear rocket	(c)	Fail safe
LN	Solar engine	(c)30	30,000 fail safe hr
LP	Electromagnetic propulsion		
P	By Number	(A)	BY DESIGNATION OF WING
	Note.— Division by (ND).		Note.— Division by (AD)
P	By Number		(Illustrative)
	Note.— Division by (ND).	(N2412)	NACA 2412
T	By Altitude (KM)	(R103)	RAE 103
	Note.— Division by (ND).		
X	By Speed (Mech N)		
	Note.— Division by SCC-6	72	ISOLATES IN [IMP]
	By Purpose		The following is a provi-
Zb	Passenger carrier		sional short list of aero-
Zc	Freight		dynamical and other prop-
Zd	Troop carrier		erties helpful in the classi-
Ze	Bomber		fication of subjects going with
Zf	Fighter		the (BS) Air Vehicle Wing
Zg	Counter measure		Production Engineering. A
Zh	Anti-submarine		more complete list of (MP)
Zj	Director		isolates for subjects in aero-
Zk	Target and drone		nautical engineering is expect-
Zm	Target tow		ed to be published later in
Zn	Liaison		an article in this series.
Zp	Observation		
Zq	Patrol	21	Aerodynamic property
Zr	Refueling tanker		
Zs	Research		
Zt	Rescue		
Zu	Trainer		
Zv	Utility	72	T 1 (A2) into (A1) begins
Zw	Administrative	74	Reynold number effect
Zx	Experimental		Heat transfer (Aerothermo-
Zy	Service test	25	chemistry)
Zzb	Space travel		Compressibility effect
Zzd	Interplanetary	25A	(Mach number effect)
Zzf	Missile	2A	Shock wave
			Superaerodynamics.

AIR VEHICLE WING PRODUCTION: DEPTH CLASSIFICATION C7.3

0b	Force	0B0	Aeroelasticity
0c	Drag	0B1	Flutter
		0B3	Damping
	<i>T 1 (A3) into (A1) begins</i>	0B32	Mass balance
0d	Form	0B4	Divergence
0f	Pressure	0B43	Oscillation
0g	Breakaway flow	0D	Airflow variable
0h	Surface friction		<i>T 2 (A4) into (A1) begins</i>
0i	Boundary layer	0E	Pressure
0k	Laminar flow	0F	Wake
0k1	Area rule	0G	Slipstream
0n	Induced drag	0Za	Load
0p	Wave resistance		<i>T 1 (A5) into (A1) begins</i>
	<i>T 1 (A3) into (A1) ends</i>	0Zc	Maneuver
		0Zd	Gust
0zF	Lift	0Ze	Net shear load to fuselage
0zH	Value of C_L for maximum C_D/C_D0	0Zx	Wing load in 2.5g maneuver
0zJ	Value of C for maximum drag	0Zh	External air load in normal cruise
0zK	Ratio of C_D/C_D0 at $C_L=0.7$	0Zj	Design load
0zL	Maximum value of C_L/C_L2		<i>T 1 (A5) into (A1) ends</i>
0zM	Maximum lift curve slope		<i>T 2 (A4) into (A1) ends</i>
0zN	Maximum lift coefficient	0X	Wing-body combination interference
0zP	Minimum drag coefficient		<i>T 1 (A2) into (A1) ends</i>
	C_{Dmin}		
0zQ	Ratio C_{Lmax}/C_{Dmin}	73	(MM) ISOLATE
0zR	Moment coefficient at zero lift C_{m0}	1	Wind tunnel
0zS	Maximum value of C_L/C_D	(Q1)	for the (MM) isolate
02	Lateral force		"1 Wind tunnel"
03	Moment		
	<i>T 2 (A3) into (A1) begins</i>	z	By Location of object in tunnel
04	Pitching		Note.— Division by SCC-2
05	Rolling	z	By Angle of attack
06	Yawing		Note.— Division by (ND)
07	Hinge		
	<i>T 2 (A3) into (A1) ends</i>	zB	By Fluid density
			Note.— Division by (ND)
08	Thrust		
09c	Motion	zC	By Reynolds number ($\times 10^3$)
09c1	Steady		Note.— Division by (ND)
09c4	Unsteady		
09f	Stability	9	By Mach Number
	<i>T 1 (A4) into (A1) begins</i>		Note.— Division by SCC-6
09g	Directional	B	By Shock tube
09h	Lateral	Bb	By Length of shock tube
09k	Longitudinal		Note.— Division by (ND)
09m	Neutral point		
09p	Derivative	Bc	By Diameter (width) of shock tube
09r	Inertia coupling		Note.— Division by (ND)
	<i>T 1 (A4) into (A1) ends</i>		

	<i>By Kind of shock tube</i>		<i>By Kind of wind tunnel</i>
BB	Straight	FB	Blow down
BC	Reflected	FD	In-draft
BF	Constant diameter	FF	Continuous
		FG	Intermittent
F	<i>By Attributes of Wind tunnel</i>	FK	Arc discharge
Fb	<i>By Length of wind tunnel</i>	FM	Closed
	<i>Note.— Division by (ND)</i>	FP	Open
Fc	<i>By Diameter (width) of wind tunnel</i>	Zb	<i>By Scale of testing</i>
	<i>Note.— Division by (ND)</i>	Zg	Model
		Zrn	Full-scale
			Flight
F	<i>By Shape of wind tunnel</i>		
	<i>Note.— Division by SCC-5</i>		

8 Examples

D8,96B

PRODUCTION ENGINEERING, AIR VEHICLE WING

D8,96B-Z0n3-Z0mH60-Zzk-9d0=005;0f;b33:fR;1-9B11-8-zC42-z50

AIR VEHICLE WING, DELTA SHAPE, BACKWARD SWEEP 60°, FLAT SURFACE, LEADING EDGE THICKNESS 0.005, PRESSURE, DISTRIBUTION, TESTING, WIND TUNNEL, MACH NUMBER 11.8, REYNOLDS NUMBER 42,000, ANGLE OF ATTACK 50°.

- 1 N66 BARBER (E A). Some experiments on delta wings in hypersonic flow. (AIAA J. 4; 1966; 72-83)

D8,96B-Z0n3-Z0mH75-ZtD1=07-zU6;0f;b33

AIR VEHICLE WING, DELTA SHAPE, BACKWARD SWEEP 75°, ASPECT RATIO 1.07, OSCILLATING FLAP, PRESSURE, DISTRIBUTION

- 2 N56 LAIDLAW (W R) and HALFMAN (R L). Experimental pressure distributions on oscillating low aspect ratio wings. (J Aeron Sc. 23; 1956; 117)

D8,96B-Z0s2-ZtD-9ZH:a247

AIR VEHICLE WING, RECTANGULAR SHAPE, LOW ASPECT RATIO WEBBED CONSTRUCTION, DEFORMATION

- 3 N62 GALLAGHER (R H) and RATTINGER (I). Deformational behaviour of low aspect ratio multiweb wings. (Aeron Q. 13; 1962; 71-87).

D8,96B-Z0zr-Z0mH-Zyc-Zb13;nf;bB;fP

AIR VEHICLE WING, CAMBERED, BACKWARD SWEEP, TWISTED EDGE, SPANWISE-CHORDWISE UNIFORM LOAD DISTRIBUTION, CENTRE SHAPE, DESIGN

- 4 N57 WEBER (J). Shape of the centre part of a swept-back wing with a required load distribution. (Gr Br. RAE, TN. Aero 2591. 1957).

D8,96B-Z0zr(G3-DB9=5=4)-Z0zp-Z0mH50-0e0=005 ->0=008-9c11=8;0j:fR;1-9E2=5-+5-z0

AIR VEHICLE WING, CAMBERED, THICKNESS/CHORD RATIO 3%, ROOT CHORD 9' 5.4", BICONVEX SHAPE, BACKWARD SWEEP 50°, LEADING EDGE THICKNESS VARIATION 0.006 to 0.008, LEADING EDGE BEVEL ANGLE 11.80, BOUNDARY LAYER, TESTING, WIND TUNNEL, MACH NUMBER 2.5 TO 5, ZERO ANGLE OF ATTACK

AIR VEHICLE WING PRODUCTION: DEPTH CLASSIFICATION C8

- 5 N66 PATE (S R) and GROTH (E E). Boundary layer transition measurements on swept wings with supersonic leading edges. (AIAA J. 4; 1966; 737-8).
- D8,96B-Z0zA-Z0zu-ZwM-Z1F6=37;0zF&fD8,96B;0j
AIR VEHICLE WING, THREE DIMENSIONAL, ELLIPTICAL SHAPE, FINITE SPAN, ASPECT RATIO 6.37, LIFT influenced by BOUNDARY LAYER
- 6 N63 SQUIRE (L C). Effect of boundary layer on the lift of finite wings. (Aeron Q. 14; 1963; 214-53).
- D8,96B-Z07D-Z0z5-9rB-0E;0p;b2
AIR VEHICLE WING, THIN CROSS SECTION, OGEE SHAPE, SUBSONIC LEADING EDGE, SUPERSONIC TRAILING EDGE, WAVE RESISTANCE, CALCULATION
- 7 N65 BEASLEY (J A). Some notes on the calculation of the zero lift wave drag of slender wings with swept trailing edges. (Gr Br. RAE, TN. 65107. 1965).
- D8,96B-Z(XE)-Z0s35-zr13;07;b2
AIR VEHICLE WING, (FOR) SUPERSONIC AIRCRAFT, ARROW SHAPE, TRIANGULAR HORN BALANCED FLAP, HINGE MOMENT, CALCULATION
- 8 N57 NAYLOR (D). Aerodynamic action of triangular hornbalanced control surfaces on the supersonic delta wing. (J Aeron Sc. 1957 Aug; 574-8).
- D8,96B-Z(Zc-XB)-Z07F-Z0mH-Zq3;0f;b33&gD8,96B;0ZG
AIR VEHICLE WING, (FOR) FREIGHT CARRIER, SUBSONIC AIRCRAFT, THICK CROSS SECTION, BACKWARD SWEEP, PASSENGER CARRIER IN WING, PRESSURE, DISTRIBUTION influenced by THICKNESS/ CHORD RATIO
- 9 N63 BEASLEY (J A). Design of very thick aerofoils for moderately high subsonic speed. (Gr Br. RAE, TN 2864. 1963).
- D8,96B-Z(ZB=111-Zb)-Z0mH-Zs-9Z3-9Z0F-9ZwB0 - 125-9Zr3-9SP4=0-zZ97-zX6-zV1-zU3-z1D-zr25-ze4-zdM-x4
AIR VEHICLE WING, (FOR) BAC 111, PASSENGER TRANSPORT AIRCRAFT, BACKWARD SWEEP, ANTI-ICE DEVICE, HONEYCOMB WITH TWO SKINS CONSTRUCTION, ALUMINIUM ALLOY MATERIAL, SKIN THICKNESS 0.125", THREE CELL CLOSED BOX CONSTRUCTION, TOP OF WING BOX OF 4.0% COPPER ALLOY, TRAILING EDGE OF RIVETED CONSTRUCTION, SIX LEADING EDGE-LOCATED FOWLER FLAPS, BALANCED AILERON, CHORD RATIO 25%. FOUR CALIPER HINGE MOUNTING, FOUR SPOILERS
- 10 N63 BENTLEY (K). Structural design. (Aircr Eng. 35; 1963; 142-4).
- D8,96B-Z(ZBE=CMK1-Zc)-Z0mH-ZxB2466-ZwB158=8-Z1F10=22-Zs-N3-9K0=17-9F0=13-9B0=27-zV1-zT82-zM59-zG15
AIR VEHICLE WING, (FOR) BELFAST CMK1, FREIGHT AIRCRAFT, BACKWARD SWEEP, WING AREA 2466 SQ FT, WING SPAN 158.8 FT, ASPECT RATIO 10.22, ANTI-ICE DEVICE, MAXIMUM LIFT COEFFICIENT 3, ROOT t/c 0.13, TIP t/c 0.27, LEADING EDGE-LOCATED DOUBLE SLOTTED FLAP, WING-FLAP SPAN 59%, ANGLE OF SETTING 15°
- 11 N63 AERODYNAMIC DESIGN. (Aircr Eng. 35; 1963; 253).

DB.96B-Z(ZH-Zb-XD-L75)-Z0mD15-ZxB324-4-ZwB47-4-
ZIF6-9Zq-9B0=33

AIR VEHICLE WING, (FOR) HANSA, PASSENGER TRANSPORT, TRAN-
SONIC, TURBOJET PROPULSION AIRCRAFT, FORWARD SWEEP 15°,
WING AREA 324.4 SQ. FT, WING SPAN 47.4', ASPECT RATIO 6,
BOX CONSTRUCTION, TAPER RATIO 0.33

- 12 N64 STEPFORWARD WINGS for the HFB 320 Hansa. (Aircr Eng.
36; 1964; 248-51).

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- 2 Sec 42 NEELAMEGHAN (A) and BHATTACHARYYA (G). Locomotive
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- 3 Sec 11 —, GOPINATH (M A) and DENTON (P H). Motor vehicle
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- 4 Sec 441 RANGANATHAN (S R). Common property isolates. (An lib
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- 5 Sec 11 —. Design of depth classification: A methodology. (Lib
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- 6 Sec 22 RANGANATHAN (T) and NEELAMEGHAN (A). Air vehicle wing
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