

BIRD STRIKE COMMITTEE EUROPE

MILITARY AIRCRAFT

BIRD STRIKE ANALYSIS

1978

Compiled by:

Squadron Leader R Kingston RAF

Inspectorate of Flight Safety (RAF)

## MILITARY AIRCRAFT BIRDSTRIKE ANALYSIS - 1978

### INTRODUCTION

1. This is the first analysis in the abbreviated format using only Table 3, 'Bird Species', and Table 7 and 7A, 'Part of Aircraft Struck' and 'Effect of Strike'. The following countries supplied data for the analysis:
  - a) Swedish Air Force (SAF)
  - b) Royal Danish Air Force (RDAF)
  - c) Royal Air Force (RAF)
  - d) United States Air Force (Europe) USAF(E)
  - e) German Air Force (GAF)

### BIRD SPECIES

2. Gulls of all types featured in 28% of the incidents in which the bird was positively identified; this compares with 35% in the 1977 analysis. As usual the lapwing takes second place with 10.5% of the total; a decrease from the 12% in 1977. Regrettably, of the total number of strikes used in the analysis (1080), the bird was identified in only 41% of the incidents.

### PARTS OF AIRCRAFT STRUCK AND EFFECT

3. The distribution of strikes is very similar to previous years with the only significant change being the increase in incidents involving the windscreen, 19.1% in 1978 compared with 13.8% in 1977. Fortunately no aircraft were lost or major injuries caused, and the proportion of strikes which caused no damage rose from 56% to 63%. There is an encouraging trend and may well reflect the efforts to reduce speed and increase height during periods of high bird activity, and the effects of bird control units which have decreased the number of multiple strikes on airfields.

TABLE 1 BIRD SPECIES

COMMON NAME	LATIN NAME	APPROX WEIGHT gms	CATEGORY	NUMBER OF STRIKES	% BASED ON 443
"Gull"	Larus sp.	400-1800	B	63	14.2
Lapwing	Vanellus vanellus	200	B	46	10.4
Swift	Apus apus	40	A	30	6.8
Wood pigeon	Columba palumbus	500	B	27	6.1
Black-headed gull	Larus ridibundus	400	B	25	5.6
Buzzard	Buteo buteo	1000	B	21	4.7
Common gull	Larus canus	400	B	20	4.5
Skylark	Alauda arvensis	40	A	17	3.8
Starling	Sturnus vulgaris	100	A	17	3.8
Columbiforme	-	200-500	-	14	3.2
Swallow	Hirundo rustica	18	A	13	2.9
Herring gull	Larus argentatus	1000	B	12	2.7
Corvid	Corvus spec.	250-550	B	10	2.2
Thrush	Turdus philomelos	70	A	9	2.0
Kestrel	Falco tinnunculus	200	B	9	.4
Partridge	Ferrix perdix	400	B	7	1.6
Hirundae	-	20	A	8	1.8
'Hawk' (var)	Acciptridae	1100	B	6	1.3
Chaffinch	Fringilla coelebs	25	A	6	1.3
House martin	Delichon urbica	18	A	5	1.1
Passerine	Passeriformes	20-110	A	4	0.9
Fieldfare	Turdus pilaris	100	A	4	0.9
Duck	Anas sp.	-	B	4	0.9
Sparrow	Passer sp.	40	A	4	0.9
Hooded crow	Corvus monedula	500	B	4	0.9
Crow	Corvus corone	550	B	3	0.7
Anatidae	-	2000	C	3	0.7
Oyster catcher	Haematopus ostralegus	550	B	3	0.7
Redwing	Turdus iliacus	70	A	3	0.7
Lesser black backed gull	Larus fuscus	800	B	3	0.7
Chaffinch	Fringilla sp.	23	A	2	-
Homing pigeon	Columba Livia var.	400	B	2	-
Anseriforme	-	300-2Kg	B	2	-
Meadow pipit	Anthus pratensis	30	A	2	-
Golden plover	Pluvialis apricaria	170	B	2	-
Mallard	Anas platyrhynchos	1.0Kg	B	2	-
Domestic pigeon	Columba livia domestica	300	B	2	-
Thrush	Turdus sp.	-	A	2	-
Snow bunting	Plectrophenax nivalis	35	A	1	-
Wheatear	Oenanthe oenanthe	25	A	1	-
Falconiformes	-	200-1Kg	B	1	-
Charadriiforme	-	-	-	1	-
Linnet	Acanthis cannabina	30	A	1	-
Ringed plover	Charadrius hiaticula	50	A	1	-
Great Skua	Stercorarius skau	c. 1400	-	1	-
Bullfinch	Pyrrhula pyrrhula	30	A	1	-
Gannet	Sula basana	3500	B	1	-
Waxwing	Bombycilla garrulus	60	A	1	-
Snipe	Gallinago gallinago	115	A	1	-
Robin	Turdus migratorius	20	A	1	-
Dove	Columba oenas	270	B	1	-
Sandpiper	Charadriiforme	-	-	1	-
Eider	Scolopacidae	20-800	-	1	-
Teal	Somateria mollissima	2.5Kg	C	1	-
Merlin	Anas crecca	300	B	1	-
Kite	Falco columbarius	200	B	1	-
Long eared Owl	Milvus milvus	1.0Kg	B	1	-
Woodcock	Asio ctus	300	B	1	-
Grey Plover	Scolopax rusticola	300	B	1	-
Greenshank	Pluvialis squatarola	200	B	1	-
Blackbird	Tringa nebularia	200	B	1	-
Yellow hammer	Turdus merula	80-100	A	1	-
Rock	Emberiza calandra	28	A	1	-
Jay	Corvus frugelignus	500	B	1	-
Small birds	Garrulus glandarius	160	B	1	-
			A	1	-
Unknown	-	-	-	443	100
				637	
				1080	

Notes: 3.1 The bird categories based on current civil airworthiness criteria are:

- CAT A - below .11 kg (1/4 lb)
- CAT B - .11 kg to 1.81 kg (1/4 to 4 lb)
- CAT C - 1.82 to 3.63 kg (4 to 8 lb)
- CAT D - over 3.63 kg (8 lb)

TABLE 7 PART OF AIRCRAFT STRUCK

PART	WEIGHT UNKNOWN	CAT A	CAT B	CAT C & D	TOTAL	% BASED ON 750
Nose (excluding radome and windscreen)	54	17	27		98	13.1
Radome	19	5	16	2	42	5.6
Windscreen	89	25	29		143	19.1
Fuselage (excluding the above)	73	16	60		149	19.9
Engine:-						
1 engine struck	50	15	48	1	114	15.2
2 out of 3 struck						
2 out of 4 struck						
3 out of 4 struck						
all struck (on multi-engined aircraft)						
Wing	54	8	35		97	12.9
Rotor/Propeller	10	3	7		20	2.7
Landing Gear	16	5	17		38	5.1
Empennage	12	1	2		15	2.0
Underwing Stores/Tanks	22	3	9		34	4.5
Part Unknown	59	7	22	1	89	
TOTAL	458	105	272	4	839	100

Notes: 7.1 The Total in Table 7 and 7A may be higher than other tables, as one bird can strike several parts.

7.2 The percentages are based on incidents where the part struck is known.

7.3 Multiple strikes are counted as one strike, unless for example both wings or both landing gears are struck, when two incidents should be recorded.

TABLE 7A EFFECT OF STRIKE

EFFECT	WEIGHT UNKNOWN	CAT A	CAT B	CAT C	CAT D	TOTAL	% BASED ON 1082
Loss of Life/Aircraft							
Flight Crew Injury							
Major							
Minor							
Slight			5			5	0.5
Premature Engine Change:							
on single engined aircraft	5	3	14			22	2.0
1 on a 2 engined "	10	5	12	1		28	2.6
1 " 4 " "	1		8			9	0.8
2 " 4 " "							
3 " 4 " "							
all engines on a multi							
Windscreen Cracked/Broken	11	1	11			23	2.1
Radome Changed	10	2	6			18	1.7
Deformed Structure	18	1	41			60	5.5
Skin Torn/Glass Broken	18	4	20	2		44	4.1
Skin Dented	73	14	49			136	12.6
Propeller/Rotor Damaged	8		2			10	0.9
Aircraft System Lost			3	1		4	0.4
Underwing Stores/Tanks damaged	11		5			16	1.5
Miscellaneous	12	3	9			24	2.2
Nil Damage	440	110	133			683	63.1
Unknown	3		1			4	-
<b>TOTAL</b>	<b>620</b>	<b>143</b>	<b>319</b>	<b>4</b>		<b>1086</b>	<b>100</b>

Notes: 7A.1 Multiple strikes are counted as one strike, unless for example both wings are damaged, or both windscreens are broken, in which case two incidents should be recorded.

7A.2 Definition of Injury requiring medical treatment:

- Major - causing absence of 21 days or over
- Minor - " " of 7 to 21 days
- Slight - injury not in above 2 categories.

7A.3 Injuries as a consequence of a strike, e.g. ejection injuries should be included.

7A.4 Aircraft system lost includes for example electrical, hydraulic, brake, air conditioning, de-icing.