EURBASE, LIMITATIONS AND OPPORTUNITIES

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Summary

This paper briefly describes the progress over the years of the European Military Bird. Strike Database. First a description is given of the growth in contributions to nearly 35,000 records from 17 Air Forces. Apart from this quantative aspect also an overview of the quality of the contributions is presented. In general the contributaion are very well suitable for analysis but careful selections of the material should be made to exclude data that do not meet the quality standards for the particular aspects to be studied.

Keywords: Statistics, Military Aviation, Reporting.

INTRODUCTION

After extensive discussions within the Air Forces Flight Safety Committee Europe (AFFSCE) in the Iate 1980's it was decided that there should be a database containing information on individual bird strikes experienced by their member Air Forces (EURBASE). Such a database was considered much more valuable in understanding the phenomenon of collisions between birds and aircraft than the hitherto collected sets of aggregated information per Air Force.

The Military Low Flying Working Group of the International Bird Strike Committee (IBSC) was considered to be the specialist group most well equipped to accompany the process of setting up such a database, the RNLAF was appointed custodian. In order to standardise the information to be collected from each bird strike a European Military Bird Strike Form (EURFORM) was developed. The final version of this form was adopted by the Military Agency for Standardisation as an annex to Standard NATO Agreement 3879 FS. A data entry program for storing the information from EURFORM was developed and made available for all AFFSCE members (Dekker & Buurma, 1992). This proved to be very important for efficiently and uniformly combining data from different Air Forces.

From the introduction of EURBASE (Dekker & Buurma, 1990) onwards data collection went along two lines. A quest for old data that was converted as much as possible to EURBASE standards and conventions and the promotion of the use of EURFORM conventions in the reporting systems of as much Air Forces as possible.

This paper describes the development of EURBASE. Apart from the growth of both the number of participating Air Forces and contributed number of bird strikes the emphasis is mainly on the quality of the contributions.

CONTRIBUTIONS

Since the last IBSC meeting in London (May 1996) the database has extended considerably. The total number of contributed bird strikes increased from 27,754 to 34,564 while the number of actual contributing nations increased from 12 to 15 (see table 1). New contributors were HAF, POAF and ISRAF. The increase in numbers is therefore not only related to *the* addition of data from *recent years* from already participating Aur Forces but also to a large extend a consequence of the contribution from 'first time contributors' and of 'historical' data from (mainly) ISRAF. The table also contains contributions, which for various reasons are not actually part of the database. These include the GAF contribution for 1996 which is only available on paper and the aggregated- information from some Air Forces collected from AFFSCE minutes and hand-outs (FINAF, POAF pre 1996 and SW IAF). Furthermore, a number of contributions were added to the database but were received to late to include in the analysis for this paper (FAF 1996+1997, IAF 1997, RAF 1996+1997).

The total number of contributed bird strikes and the number of years of which data are available for each Air Force are pictured in figure 1. This figure also indicates the quality of each Air Force's dataset, this quality being defined as the number of items from EURFORM of which there is an extreme lack of information (see later). It is clear from figure 1 that independent of the quantity of the contributions there are considerable differences in quality.

FORCES	YRS	TOTAL	97	96	95	94	93	92	91	90	89	88	87	86	85	-84	83	82	81	80	Pre 80
AAF											and the second					Name and Address of the Owner, where the Owner, which is the Owner, which is the Owner, which is the Owner, where the Owner, which is the Owner					
BAF	9	764		80	67	85	70	64	76	95	115	113									
CZAF	7	215		250	33"	30	23	38	25	41						-					
FAF	19	3,498	289	65	158	240	211	183	221	122	180	189	180	70	70	126	170	196	206	188	42
FINAF	12	340		39 ⁰	31 ^D	369	49 ⁰	35 ⁰	26°	38°	28 ⁰	16 ⁰	16 ^D	80	16 ⁰						195
BAF	18	9,000		396 ^A	387	425	489	443	497	602	623	:604	580	415	474	505	655	615	503	429	3
HAF	.4	77	50 ⁸⁰	· 5 ^{scr}	- 15 ^{80E}	7 ^{BCE}	E	e e			- 1									184	
HUAF		E F														NA.					1919
IAF .	7	1,096	146	155	186	174	184	84	101	66											
POAF	18	129	10 ^{5C}	84	98	2"	110	70	13 ^D	60	120	4 ^D	4 ^D	120	80	80	10	50	5 ⁰	40	
RAF	16	11,394	427	372	508	555	533	613	589	638	638	748	879	710	743	778	768	785	693	621	
RDAF	7	312				26	46	40	51	68	45	38									
RNLAF	22	3,413	77	93	108	100	93	107	92	183	243	195	181	154	151	176	224	281	176	131	6
RNOAF	11	340		. 10	33	53	36	29	28	36	37	38	13	14	25						6
SAF	21	187			85	. 10	13	7	11	10	20	6	9	22	1	0	3	2	3	1	
SKAF	3	58			22	17	19						~								43
SWEAF			018		. 1																100
SWIAF	1	11		110																	
USAF(E)	8	2,264						115	254	361	336	264	278	374	282						
ISRAF	.14	2,466		247	194	221	170	218	247	238	262	167	138	125	112	23	104				
-6-																					
TOTAL		34,564	899	1496	1792	1990	1947	1983	2330	2502	2539	2380	2078	1904	1882	1616	1925	1884	1585	1374	14
FORCES		17	8	12	14	15	14	14	14	14	12	12	10	10	10	7	7	6	8	6	ur

Table 1: Available data in Eurbase per spring 1998. Figures represent the number of contributed bird strikes per Air Force and per year.

Shading indicates the availability of flying hours per aircraft type for that particular Air Force and year (source: AFFSC(E) handouts).

Data (per Air Force, per year) included in further analysis are printed in bold italics (N=33.418)

Only available on paper, only limited detailed information per individual BS available

Only limited detailed information per individual BS available

Only available for part of year

Total numbers of BS per year are given; detailed information not or only for a limited number of BS

Only total flying hours available (not per AC-type)

Data received too late to include in this analysis

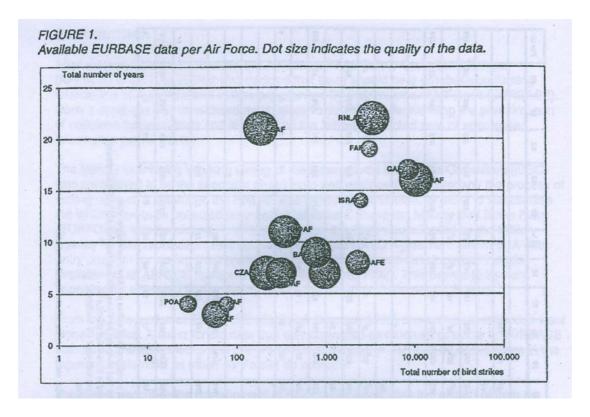


Figure 1 clearly demonstrates that 'the total database as a single source of information is very heterogeneous and should be consulted with care. Large datasets (both with respect to years and numbers) from large Air Forces are obviously dominating the database but may not always add to the usefulness if the analysis is concerning items on which there is only very limited information available. So depending on the scope of the analysis suitable datasets should be selected. In time however a growing proportion of the database will consist of contributions from recent years from Air Forces that adopt EURBASE conventions and therefore the database will in time grow closer to the EURBASE standards.

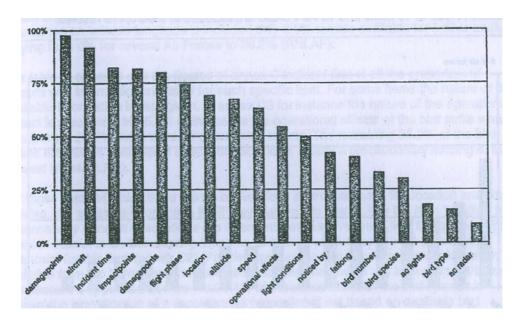
LIMITATIONS

In order to get some insight in the usefulness of the data collected in EURBASE the dataset from each Air Force has been evaluated with respect to the most relevant 18 items from EURFORM. For each item this was done by establishing the proportion of the dataset scoring 'unknown'. Furthermore, for some of the items the actual content was looked at in more detail. The results are presented in annex A (absolute numbers) and annex B (percentages).

The percentages per Air Force (annex B) facilitate an overall quality establishment for each item as depicted in the five first columns:

- a. average value from the 15 Air Forces
- b. standard deviation of this average value
- c. standard deviation expressed as a percentage of the average value
- d. minimum value scored for one or more Air Forces
- e. maximum value scored for one or more Air Forces
- f. Overall total mean from the combined dataset

FIGURE 2 Overall mean percentage of records containing information for each one of 18 selected items.



In figure 2 for each of the 18 selected items the overall total mean percentage of records containing information is presented. The differences are striking. Obvious information like whether or not the bird strike resulted in damage or the aircraft involved in the bird strike have scores of over 90% (not 100%t) while other items like e.g. bird species score only very low (30%).

Good reporting is not always characterised by 100% scores on all items. For instance those Air Forces in which groundcrew is alert on bird strikes will have a relatively large number of bird strikes which are only reported because they were noticed by the groundcrew. This will result in a high proportion of 'unknowns' for a number of items. For each item an extreme lack of information was therefore defined as a percentage 'unknown' of more than the mean of the 15 Air Forces plus the standard deviation. Figure 3 shows for each item the number of Air Forces that score such an extreme lack of information. The number of such items per Air Force is given in figure 4. Not surprisingly, those Air Forces that are using EURFORM in their reporting system (CZAF, IAF, RAF, RNLAF, SAF and SKAF) are scoring best. Those Air Forces from which the data had to be extracted from different reporting systems show a larger number of items lacking information.

The above mentioned quality indicating values from annex B are made visible in the figures in annex C of which some will be dealt with in more detail here.

Annex C1 shows the results for some relatively good quality items. The mean of 15 Air Forces for these items all score over 65% (horizontal line). Nevertheless there are Air Forces in which no records at all contain information (dots) while other Air Forces score around 100% (triangles). This figure also indicates that information on some items may be linked. For instance 'speed' scores an overall mean of 63% and altitude 67.2%. If information on these items was randomly present in the dataset one would expect $63 \times 67.2 = 42.3\%$ for the combination. In reality this combination scores 60.4%; so if one of these items is known the other most probably is also known.

FIGURE 3.

Number of Air Forces per item with extreme lack of information. Extreme lack of information is defined as a number of "unknowns" being more than the total mean + standard deviation. A total of 18 items and 15 Air Forces are included in the 33,418 records.

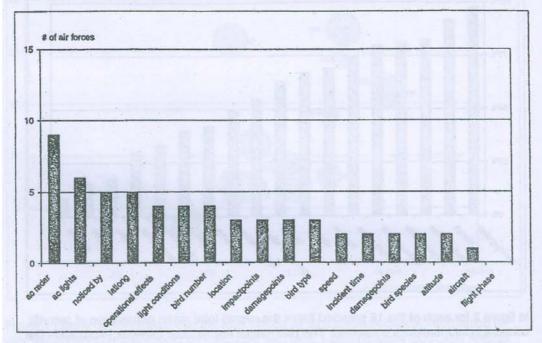
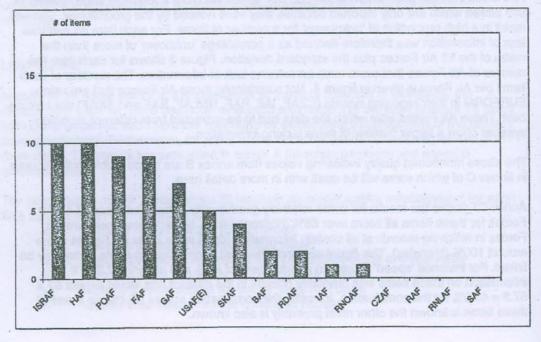


FIGURE 4.

Number of items per Air Force with extreme lack of information. Extreme lack of information is defined as a number of "unknowns" being more than the total mean + standard deviation. A total of 18 items and 15 Air Forces are included in the 33,418 records.



A quite different situation is pictured in annex C14. In only 30.1 % of the cases information is available on the bird species involved in the bird strike, varying from 0 to 70.6%. If those cases of which bird remains were present and the bird species is known are combined with speed and altitude in only 11.2% of the database information is available. If also information on latitude-longitude is included only 8.9% remain available for further analysis, varying from 0% for several Air Forces to 36.2% (RNLAF).

The table of annex B and the figures of annex C indicate first of all the proportion of records with information available for each specific item. For some items the nature of the available information is also given. In annex C3 for instance the nature of the operational impact is presented. In 45.6% of the cases the operational effects of the bird strike were unknown; in 29.2% there were no operational effects. The remaining 25.2% of the bird strikes resulted in operational effects of some kind, mostly a precautionary landing at the nearest airfield (LNA).

For those items of which there are no conventions on the contents, like location and bird species, the available information itself may also vary in quality. For the item 'location' for instance very general descriptions are often entered like 'over sea'; 'low flying area NR x' or 'mission from A to B'. Considering these as 'unknown' will further rise the percentage 'unknown' for this item (annex C2). For bird species there is supplementary information available from the items 'remains collected' and 'identified by'. If this information is taken into account it appears that from the 30.1 % of the cases of which the bird species is 'known' the identification of a considerable proportion is not based on available bird remains or is otherwise obscure (annex C15).

Apart from the information in EURBASE for distinct types of analysis information on flying hours is needed. As is dear from table 1 such information could be extracted for r Forces from AFFSCE minutes. It should be kept in mind however that only totals is aircraft type and per year are given and some Air Forces even suffice in providing flying hours for all aircraft types combined.

OPPORTUNITIES

The extensive enumeration of limitations might suggest that despite the large number of bird strikes that are contributed the usefulness of EURBASE is only very limited. This however is not the case; as long as the nature of the limitations are known and taken in consideration the material can very well be helpful in the better understanding of the problem of bird strikes. In the past EURBASE data have been used for studies:

The paper presented at the 21st BSCE meeting in Jerusalem 'Bird strike hazard to helicopters' (Buurma & Dekker, 1992) offered such new perspectives that it was -on invitation- also presented at the 'Eighteenth European Rotorcraft Forum' (Buurma & Dekker, 1992). Especially the strike frequency per flying hour of helicopters with birds of different weight was (and still is) a unique product of joined information from GAF, RAF and RNLAF.

For the 119" meeting of AFFSCE a comparative study was done using data from FAF, GAF, RAF, RDAF and RNLAF (Buurma, 1995). The results were also incorporated in a presentation at the 23rd BSCE meeting in London (Buurma & Dekker, 1996). The extremely deviating figures from RNLAF suggested a positive effect of the introduced bird strike warnings based on radar observations using the ROBIN system.

The altitude profile of local bird strikes for different Air Forces that was presented at the 23rd BSCE meeting in London (Buurma, 1996) indicates that the bird strike risk is changing from mainland Europe to more coastal areas. The most obvious explanation being the fact that the bird populations in wetland, coastal areas apparently are larger and flying at higher altitudes.

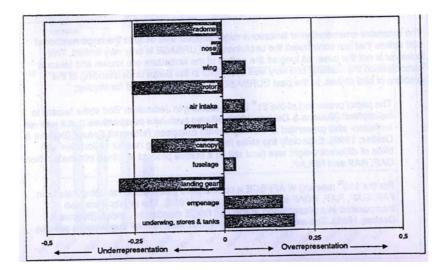
These very general studies reveal clues and hints for further, more detailed studies. With the recent increase in numbers the size of the database now is getting enough critical mass to enable this. Furthermore, the addition of more recent data will increase the proportion of the database that is fully up to EURBASE standards.

The bird strike resistance of different aircraft parts could be the subject for such a detailed study. Comparing the distribution of impactpoints with that of damagepoints shows some intriguing differences (figure 5). Aircraft parts like radome, (nose) and canopy/windscreen which are in view of the pilot are underrepresented with respect to damage. This probably not indicates a better 'bird hazard resistance' but rather points at reporting effects. In contrast the empennage, powerplant and underwing stores and tanks seem overrepresented in damagepoints which not just means that these parts are, very vulnerable but that non-

damage impacts on the aircraft parts easily go unreported. At first sight this might suggest that there are too much 'on-the-other-hands' and that the data are therefore of no use. In reality the discrepancies are so distinct that they offer possibilities for further detailed analysis. These should be focused on single aircraft types and incorporate the chance of a bird strike to be on specific aircraft parts based on the frontal area of the aircraft.

FIGURE 5.

Relative under or overrepresentation of damage cases for 11 impactpoints. Representation is expressed as perceptual distribution of damagepoints divided by the perceptual distribution of impactpoints.



Further opportunities for the use of EURBASE data can be expected from modern statistical techniques that have a very high discriminating potential. It should always be kept in mind however that using these very sensitive techniques only will reveal new information if careful selection of relevant EURBASE data will be an integral part of the process.

CONCLUSIONS

Table 1 clearly shows that since the introduction of EURBASE at the *2e* IBSC meeting in 1990 (Dekker & Buurma, 1990) huge achievements are made. Not only are the nearly 35,000 records a valuable source of information, the fact that this information is originating from 15 Air Forces and often dating back since the early 1980's is very important and indicates that a general need is felt to support EURBASE.

EURBASE's civil counterpart, ICAO's world wide bird strike information system IBIS, is already operational since 1980 and contains information on 62,000 bird strikes from 45 of ICAO's member states (Pinos, 1996). This perspective, and the fact that European military aircraft movements only form a fraction of world wide air traffic makes the success of EURBASE extra remarkable.

Unfortunately the quantitative success of EURBASE is somewhat counterbalanced by qualitative shortcomings. Although these are not necessarily prohibitive to the use of the data, full advantage from a joined database is only achieved when more contributing Air Forces adopt EURBASE standards and conventions in their reporting system. Until the time has come that bird strikes are uniformly registered in all contributing Air Forces any analysis should be preceded by a careful selection of 'valid material'.

ACKNOWLEDGEMENTS

This paper could only be written thanks to the contributors of data. A special word of thanks therefore for all those 'points of contact' of which there are too many to be mentioned here by name. Gilbert Alicaris carefully screened AFFSCE minutes and handouts on bird strike information. Naps van Gasteren helped with the extensive computer work that sometimes is involved in converting data from national reporting systems to EURBASE standards. Finally Luit Buurma read earlier drafts and made valuable comments.

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					El	JRBASE	absolul	e numbe	ers							Page 1
	TOTAL	BAF	CZAF	FAF	GAF	HAF	IAF	ISRAF	POAF	RAF	RDAF I	RNLAFF	NOAF	SAF	SKAF L	ISAFE
Dodad		88-96	90-96	77-95	79-95	94-97	90-96	8396	94-97	80-95	88-94	76-97	85-95	75-95	93-95	85-92
Period Years		9	7	19	17	4	7	14	4	16	7	22	11	21	3	8
Records	33418	764	215	3144	8604	77	950	2466	29	10595	312	3413	340	187	58	2264
nctime known	27513	515	215	3125	6600	77	605	0	29	10308	296	3245	301	162	24	2011
	30683	535	215	3143	8604	77	948	0	29	10559	311	3413	340	187	58	2264
Aircraft known		693	215	3143	8560	75	950	2423	25	10585	311	3412	340	184	58	2264
AC-type known	33238		0	3143	8500	0	2	2423	0	30	0	0	0	0	0	0
Aicraft ?? but type known	2615	159	1000	,	0		. 2	2423							155	5200
Speed known	21042	594	124	2715	4122	74	747	0	28	7957	228	2331	276	183	21	1642
Altitude known	22465	538	166	2565	4126	74	679	1756	28	7890	222	2312	278	184	36	1611
Speed + altitude known	20185	530	122	2510	3883	74	668	0	28	7809	221	2303	265	183	18	1571
	23054	373	143	0	6862	76	732	1788	26	9587	72	2919	291	159	26	0
ocation given		127	96	0	6434	0	454	0	0	1596	63	1768	236	99	0	0
Location + latLong given	10873 13397	329	96	27	6479	0	469	0	1	1620		1919	244	112	0	1869
Total LatLong given	13397	323	80		0110		400			- 23		- 10	0.0	4	- 5	
Flightpase unknown	8630	139	23	530	2806	3	177	362	3	2728	83	1044	22	. 8		682
Flightphase known	24788	625	192	2614	5798	74	773	2104	26	7867	229	2369	318	179	38	1582
One code given	23755	603	180	1978	5798	71	760	1867	26	7867	219	2281	311	176	38	1580
Two codes given	1022	22	12	632	0	3	12	237	0	0	9	83	7	3	0	2
Three codes given	11	0	0	4	0	0	1	0	0	0	- 1	5	0	. 0	0	0
Flighphase:																
TAX	273	5	0	. 20	159	0			0	20		13	1	0		0
TOF	2636	59	11	165	403	5				849		308	64	25		206
CLI	375	10	5	65	127	- 1	21	0		27		42	20	3		42
LE	12844	374	42	904	3930	60	183	100	12	5010			19	79		840
CRU	3800	. 7	75	1662	0	7	266		1	177				20		120
HOL	143	6	6	. 0	3	0	21		0					12		0
DES	238	5	4	114	0	0	8		1	17			2	4		19
FAP	-2550	82	10	130	795	0				886				15		145
LAN	2176	87	49	163	371	4			1	274				16		212
TGO	797	12	2	31	10	0						157	10	8		0
Total Flightphase codes	25832	647	204	3254	5798	77	787	2341	26	7867	240	2462	325	182	38	1584
CRU or LLE	16090	378	106	2044	3930	65	446	1321	13	5187			107	99		960
FAP or LAN	4684	167	58	392	1166	4			5	1160	82	538	119	31	7	357

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TOTAL	BAF	CZAF	FAF	GAF	HAF	IAF	ISRAF	POAF	RAF	RDAF	RNLAFR	NOAF	SAF	SKAF	USAFE
15250	16	58	819	8604	77	579	2466	26	2099	2	132	1	67	0	304
9759	460	126	2325	0	0		0	3							1381
461	16	2	0	0	0		0	0							0
2024	61	21	0	0	0		0	0					32	_	488
5918	209	8	0	0	0	37	0	0	4906				- 1		91
764	46	5	0	0	0	15	0	0	2	27			- 1	0	84
6	2	0	- 0	0	0	0	0	0	0	0	2	2	0	0	0
50	5	0	. 7	6	0	1	3	0	16	0	4	3	3	0	2
19343	77	58	3144	8604	75	280	423	25	4159	30	18	156	28	2	2264
2883	123	58	. 0	0	2	82	204	1	917	88	1338	31	11	28	0
11189	564	99	. 0	0	0	588	1839	2	5518	193	2057	153	148	28	0
6150	37	58	1686	90	75	117	2466	25	1256	15	89	18	66	0	
27268	727	157	1458	8514	2	833	0	4	9339	297	3324	322	121	58	2112
23918	561	119	1241	8356	2	755	0	4	7666	240	2589	241	88	49	2007
2698	129	33	193	158	0	61	.0	0	1323	52	567	60	27	5	90
491	26	4	21	0	0	14	0	0	270	5	119	16	2	2	12
161	11	1	3	0	0	3	0	0	80	0	49	5	4	2	3
2405	76	1	0	1032	0	87	0	1	659	15	284	21	11	1	217
			0		0		0	0	1763	30	516	21	22	1	109
			0		0		0	2	2157	45	438	63	23	11	408
			13		0	6	0	0	346	11	88	23	4	4	11
1963	58	58	346	591	0	212	0	0	279	47	127	23	12	20	190
5091	231	34	413	1710	2	50	0	1	1493	39	705	91	16	11	295
6710	197	34	314	1952	. 0	195	0	0	2437	57	841	60	43	13	567
4072	86	16	454	1209	0	121	0	0	1376	36	473	54	17	8	222
					0			0	80	43	330	60	10	1	51
1707070000		-			0	8	0	0	310	8	60	5	1	2	35
					0		0	0	540	28	414	8	5		130
31429	941	201	1702	8672	2	931	0	4	11440			429	164		
	15250 9759 461 2024 5918 764 6 50 19343 2883 11189 6150 27268 23918 2698 491 161 2405 2816 4236 798 1963 5091 6710 4072 1089 622 1627	15250 16 9759 460 461 18 2024 61 5918 209 764 46 6 2 50 5 19343 77 2883 123 11189 564 6150 37 27268 727 23918 561 2698 129 491 26 161 11 2405 76 2816 78 4236 81 798 16 1963 58 5091 231 6710 197 4072 86 1089 72 622 18 1627 28	15250 16 58 9759 460 126 461 16 2 2024 61 21 5918 209 8 764 46 5 6 2 0 50 5 0 19343 77 58 2883 123 58 11189 564 99 6150 37 58 27268 727 157 23918 561 119 2698 129 33 491 26 4 161 11 1 2405 76 1 2816 78 10 4236 81 30 798 16 55 1963 58 58 5091 231 34 6710 197 34 4072 86 16 1089 72 12 622 18 1 1627 28 0	15250 16 58 819 9759 460 126 2325 461 16 2 0 2024 61 21 0 5918 209 8 0 764 46 5 0 6 2 0 0 50 5 0 7 19343 77 58 3144 2883 123 58 0 11189 564 99 0 6150 37 58 1686 27268 727 157 1458 23918 561 119 1241 2698 129 33 193 491 26 4 21 161 11 1 3 2405 76 1 0 2816 78 10 0 4236 81 30 0 798 16 5 13 1963 58 58 346 5091 231 34 413 6710 197 34 314 4072 86 16 454 1089 72 12 25 622 18 1 60	TOTAL BAF CZAF FAF GAF 15250 16 58 819 8604 9759 460 126 2325 0 461 16 2 0 0 2024 61 21 0 0 5918 209 8 0 0 764 46 5 0 0 0 6 2 0 0 0 50 5 0 7 6 19343 77 58 3144 8604 2883 123 58 0 0 11189 564 99 0 0 1189 564 99 0 0 27268 727 157 1458 8514 23918 561 119 1241 8356 23918 561 119 1241 8356 23918 561 119 1241 8356 23918 561 119 1241 8356 2405 76 1 0 1032 2405 76 1 0 1032 2816 78 10 0 158 4236 81 30 0 885 798 16 5 13 271 1963 58 58 346 591 5091 231 34 413 1710 6710 197 34 314 1952 4072 86 16 454 1209 1089 72 12 25 367 622 18 1 60 114 1607 28 0 77 383	TOTAL BAF CZAF FAF GAF HAF 15250 16 58 819 8604 77 9759 460 126 2325 0 0 461 16 2 0 0 0 2024 61 21 0 0 0 5918 209 8 0 0 0 66 2 0 0 0 0 50 5 0 7 6 0 19343 77 58 3144 8604 75 2883 123 58 0 0 2 11189 564 99 0 0 0 6150 37 58 1686 90 75 27268 727 157 1458 8514 2 2898 129 33 193 158 0 491 26 4 21 0 0 161 11 1 3 0 0 2405 76 1 0 1032 0 2816 78 10 0 158 0 4236 81 30 0 885 0 798 16 5 13 271 1963 58 58 346 591 0 5091 231 34 413 1710 2 6710 197 34 314 1952 0 4072 86 16 454 1209 0 1089 72 12 25 367 0 622 18 1 60 114 0	TOTAL BAF CZAF FAF GAF HAF IAF 15250 16 58 819 8604 77 579 9759 460 126 2325 0 0 188 461 16 2 0 0 0 0 12 2024 61 21 0 0 0 34 5918 209 8 0 0 0 37 764 46 5 0 0 0 0 15 6 2 0 0 0 0 0 0 50 5 0 7 6 0 1 19343 77 58 3144 8604 75 280 2883 123 58 0 0 2 82 11189 564 99 0 0 0 588 6150 37 58 1686 90 75 117 27268 727 157 1458 8514 2 833 23918 561 119 1241 8356 2 755 2698 129 33 193 158 0 61 491 26 4 21 0 0 14 161 11 1 3 0 0 3 2405 76 1 0 1032 0 87 2816 78 10 0 158 0 108 4236 81 30 0 885 0 93 798 16 5 13 271 0 6 1963 58 58 346 591 0 212 5091 231 34 413 1710 2 50 6710 197 34 314 1952 0 195 4072 86 16 454 1209 0 121 1068 72 12 25 367 0 38 622 18 1 60 114 0 886 61627 28 0 77 383 0 13	TOTAL BAF CZAF FAF GAF HAF IAF ISRAF 15250 16 58 819 8604 77 579 2466 9759 460 126 2325 0 0 188 0 461 16 2 0 0 0 12 0 2024 61 21 0 0 0 34 0 5918 209 8 0 0 0 37 0 764 46 5 0 0 0 0 15 0 6 2 0 0 0 0 0 0 0 50 5 0 7 6 0 1 3 19343 77 58 3144 8604 75 280 423 2883 123 58 0 0 2 82 204 11189 564 99 0 0 0 588 1839 6150 37 58 1686 90 75 117 2466 27268 727 157 1458 8514 2 833 0 2898 129 33 193 158 0 61 0 2898 129 33 193 158 0 61 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2405 76 1 0 1032 0 87 0 2406 79 16 5 13 271 0 6 1963 58 58 346 591 0 212 0 1963 0 93 0 1960 72 12 25 367 0 38 0 106710 197 34 314 1952 0 195 0 0 1069 72 12 25 367 0 38 0 1627 28 0 77 383 0 13	15250	TOTAL BAF CZAF FAF GAF HAF IAF ISRAF POAF RAF 15250 16 58 819 8604 77 579 2466 26 2099 9759 460 126 2325 0 0 188 0 3 2670 461 16 2 0 0 0 12 0 329 2024 61 21 0 0 34 0 0 691 5918 209 8 0 0 0 37 0 0 4906 75 0 4906 6 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL BAF CZAF FAF GAF HAF IAF ISRAF POAF RAF RDAF 15250	TOTAL BAF CZAF FAF GAF HAF IAF ISRAF POAF RAF RDAF RNLAFR 15250 16 58 819 8604 77 579 2466 26 2099 2 132 9759 460 126 2325 0 0 188 0 3 2670 201 203 461 16 2 0 0 0 12 0 0 329 5 53 2024 61 21 0 0 0 34 0 0 691 51 617 5918 209 8 0 0 0 37 0 0 4906 53 576 764 46 5 0 0 0 0 0 0 2 27 571 6 2 0 0 0 0 0 0 0 0	TOTAL BAF CZAF FAF GAF HAF IAF ISRAF POAF RAF RDAF RNLAF RNOAF 15250	TOTAL BAF CZAF FAF GAF HAF IAF ISRAF POAF RAF RDAF RNLAFRNOAF SAF 15250 16 58 819 8604 77 579 2466 26 2099 2 132 1 67 9759 460 126 2325 0 0 188 0 3 2670 201 2033 253 76 461 16 2 0 0 0 12 0 0 329 5 53 30 11 2024 61 21 0 0 0 0 34 0 0 691 51 617 20 32 5918 209 8 0 0 0 0 37 0 0 4906 53 576 34 1 764 46 5 0 0 0 0 15 0 0 2 27 571 13 1 6 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 27 571 13 1 6 2 0 0 0 0 0 1 3 0 0 0 0 0 0 0 0 0 0 0 0 0	TOTAL BAF CZAF FAF GAF HAF IAF ISRAF POAF RAF RDAF RNLAFRNOAF SAF SKAF 15250 16 58 819 8604 77 579 2466 26 2099 2 132 1 67 0 9759 460 126 2325 0 0 188 0 3 2670 201 2033 253 76 43 461 16 2 0 0 0 0 12 0 0 329 5 53 30 11 3 2024 61 21 0 0 0 0 34 0 0 691 51 617 20 32 9 5918 209 8 0 0 0 37 0 0 4906 53 576 34 1 3 764 46 5 0 0 0 0 15 0 0 2 27 571 13 1 0 6 2 0 0 0 0 0 1 3 0 0 0 0 0 2 27 571 13 1 0 6 2 0 0 0 0 0 1 3 0 16 0 4 3 3 0 19343 77 58 3144 8604 75 280 423 25 4159 30 18 156 28 2 2883 123 58 0 0 2 82 204 1 917 88 1338 31 11 28 11189 564 99 0 0 0 0 588 1839 2 5518 193 2057 153 148 28 6150 37 58 1686 90 75 117 2466 25 1256 11 89 18 66 0 27268 727 157 1458 8514 2 833 0 4 9339 297 3324 322 121 58 2898 129 33 193 158 0 61 0 0 1323 55 76 60 27 54 491 26 4 21 0 0 14 0 0 270 5 119 16 2 2 2405 76 1 0 1032 0 87 0 1 689 15 284 21 11 1 2816 78 10 0 158 0 108 0 0 1763 30 516 21 22 1 4236 81 30 0 885 0 93 0 2 2157 45 488 63 23 11 798 16710 197 34 314 1952 0 108 0 0 1493 39 705 91 16 17 798 16710 197 34 314 1952 0 195 0 0 2437 57 841 60 33 60 10 11 798 16 5 13 271 0 6 0 0 348 11 88 23 4 4 1 1963 58 58 346 591 0 212 0 0 279 5 841 88 63 23 11 798 16 5 13 271 0 6 0 0 348 11 88 23 4 4 1 1963 58 58 346 591 0 212 0 0 279 5 841 88 39 705 91 16 11 799 16 15 13 271 0 6 0 0 348 11 88 23 4 4 1 1963 58 58 346 591 0 212 0 0 279 5 841 88 63 23 11 798 16 5 13 271 0 6 0 0 348 11 88 23 4 4 1 1963 58 58 346 591 0 212 0 0 279 47 127 23 12 20 5091 231 34 413 1710 2 50 0 18 0 0 149 3 705 91 16 11 600 77 34 314 1952 0 195 0 0 2437 57 841 60 43 13 4072 86 16 454 1209 0 121 0 0 1376 36 473 54 17 8 1069 72 12 25 367 0 38 0 0 80 43 330 60 10 11 600 77 383 0 13 0 0 540 28 444 8 5 5 1

^{**} Information from Richardson 1996 and AFFSC(E) minutes

					El	JABASE	absolu	te numb	ers							Pa
	TOTAL	BAF	CZAF	FAF	GAF	HAF	IAF	ISRAF	POAF	RAF	RDAF I	RNLAFR	NOAF	SAF	SKAFL	JSAFE
Damage≈NO, points given	1222	0	0	0	0	0	49	878	0	294	1	0	0	0	0	. 0
Damage=YES, no points	455	1	0	0	0	0	2	0	0	430	2	0	1	19	0	0
Remaining valid cases	31741	763	215	3144	8604	77	899	1588	29	9871	309	3413	339	168	58	2264
Damage=NO	20163	549	147	0	6771	55	505	1037	13	5735	244	2776	233	112	35	1951
Damage∞ UNK	772	9	2	331	0	0	139	109	0	165	3	0	12	1	1	100
Damage=Yes	10806	205	66	2813	1833	22	255	442	16	3971	62	637	94	55	22	31
Damagepoints Unknown	2197	1	11	1355	25	20	8	442	12	255	0	1	2	0	0	6
Damagepoints known	8609	204	55	1458	1808	2	247	0	4	3716	62	636	92	55	22	24
One damagepoint given	8150	182	51	1241	1790	2	236	0	4	3655	56	560	85	44	18	22
Two damagepoints given	394	13	4	193	18	0	11	0	0	48	6	62	6	11	4	1
Three damagepoints given	50	7	0	21	0	0	0	0	0	9	0	10	1	0	0	
Four damagepoints given	15	2	0	3	0	0	0	0	0	4	0	4	ó	0	0	
Damagepoint:	4.13	197			- 1	9	1			200			0		U	
RAD	. 404	10	0	0	196	0	20	0	1	96	2	45	8	3	0	2
NOS	779	28	3	0	18	0	29	0	0	582	8	90	4	7	0	1
WIN	1423	25	19	0	306	0	47	0	2	854	5	48	15	16	6	8
TOF	126	11	3	13	34	0	2	0	0	50	2	7	2	0	1	
AIT	646	20	. 4	346	65	0	57	0	0	69	7	51	6	0	4	1
POW	2079	66	23	413	451	2	24	0	1	733	15	222	36	14	12	6
CAN	1231	19	. 1	314	237	0.	28	0	0	501	6	83	9	12	1	2
US	1284	24	4	454	235	0	32	0	0	424	8	63	11	5	1	2
AN	169	12	2	. 25	63	0	11	0	0	16	5	21	. 4	5	0	
MP	269	10	0	60	46	0	2	0	0	123	3	14	0	1	1	
JST	738	12	0	77	175	0	6	0	0	346	7	86	- 5	3	0	2
otal damagepoints	9148	237	59	1702	1826	2	258	0	4	3794	68	730	100	66	26	27
C lights unknown	27417	764	71	3144	8603	77	588	2466	29	8824	47	1934	336	24	26	48
C lights known	6001	0	144	0	1	0	362	0	0	1771	265	1479	4	163	32	178
C lights OFF	1749	0	24	0	0	0	120	0	0	250	108	621	1	100	17	500
C lights ON	4252	0	120	0	1	0	242	0	0	1521	157	858	3	63	15	1272
C radar unknown	30451	764	150	3144	8604	77	635	2466	29	8651	312	2959	340	29	27	226
C radar known	2967	0	65	0	0	0	315	0	0	1944	0	454	0	158	31	-
C radar OFF	1953	0	40	0	0	0	207	0	0	1406	0	142	0	127	31	
C radar ON	1014	0	25	0	0	0	108	0	0	538	0	312	0	31	0	ì

					EL	IRBASE	absolu	te numbe	ers							Page
	TOTAL	BAF	CZAF	FAF	GAF	HAF	IAF	ISRAF	POAF	RAF	RDAF I	RNLAFR	NOAF	SAF	SKAF L	JSAFE
Lightconditions unknown	16849	100	0	211	7822	69	531	245	24	3685	3	1800	3	69	23	2264
Lightconditions known	16569	664	215	2933	782	8	419	2221	5	6910	309	1613	337	118	35	0
DAWN	47	0	. 0	0	0	0	12	8	0	14	2	9	1	1	0	0
DAY	14926	632	182	2712	711	8	373	1603	5	6449	291	1506	310	115	29	0
DUSK	154	4	1	0	0	0	8	66	0	42	1	19	8	1	4	0
NIGHT	1441	28	32	221	71	0	26	543	0	405	15	79	18	1	2	0
LOCENR unknown	8073	132	21	530	3064	3	162	356	2	2182	73	968	35	3	.17	525
LOCENR known	25344	632	194	2614	5540	74	788	2110	27	8413	239	2445	304	184	41	1739
LOCENR=LOC	8103	223	76	565	1480	9	328	768	12	2554	117	1061	195	69	16	630
LOCENR=ENR	17242	409	118	2049	4060	65	460	1342	15	5859	122	1384	110	115	25	1109
Remains, LAB, Spec. known	2624	102	1	0	0	0	0	312	0	278	56	1812	23	. 0	4	36
Remains, BCU, Spec, known	850	- 2	37	0	0	0	0	113	0	297	0	391	0	4	6	0
Remains, GRD, Spec. known	119	3	2	0	0	0	6	0	0	31	1	72	2	1-	1	0
Remains, Pil., Spec. Known	106	0	9	0	0	0	12	0	0	62	2	19	0	1	1	0
Remains, UNK, Spec. Known	2874	115	0	0	2612	0	1	0	0	42	36	21	38	6	3	0
Total Remains, Spec. Known	6573	222	49	0	2612	0	19	425	0	710	95	2315	63	12	15	36
No remains, PIL, Spec. known	257	14	11	0	0	0	42	0	0	87	10	60	7	23	3	0
No remains, OTH, Spec, known		5	2	0	0	0	10	4	0	150	16	14	6	9	0	0
Total No remains, Spec. Known		19	13	0	0	0	52	4	0	237	26	74	13	32	3	0
Remains ???, Spec. Known	3028	56	4	0	143	0	61	0	17	2344	1	22	117	32	0	231
Total Species known	10074	297	66	0	2755	0	132	429	17	3291	122	2411	193	76	18	267
Birdnumber unknown	22440	512	86	3144	7859	77	534	2466	29	4524	92	2590	215	21	0	291
Birdnumber=SIN	8643	177	107	0	513	0	357	0	. 0	4914	163	561	83	114	54	1600
Birdnumber=FLO	1676	75	22	0	0	0	59	0	0	873	49	186	26	52	1	333
Birdnumber=figure	659	0	0	. 0	232	0	0	0	0	284	8	76	16	0	3	40
Bird type unknown	28240	259	63	3144	8043	2	306		23	9144		2754	50	33		2264
Bird type S	2546	211	82	0	308	21	* 344	183	5	725	114	328	139	68		0
Bird type M	2076	260		0	182	45	255	193	1	524	110	255	132	62		0
Bird type L	556	34	19	0	71	9	45	53	0	202	2	76	19	24	2	0
	TOTAL	Bit	CPI	EVE	911	Inter.	- 40	-	1000	000	70	1510	53	12	6	17
Remains+Spec+Speed+Alt.	3734	171	23	. 0	1264	0	19		0	609		1512	46	10		17
Ditto and Latlong	2968	74	19	0	1184	0	13	0	0	293	76	1236	46	10	0	17

Annex A, page 4

							EUI	IDASC	perce	mayes											Page 1	
	100%	AVE	STDV	%sdev	MIN	MAX	TOTAL	BAF	CZAF	FAF	GAF	HAF	IAF	ISRAF	POAF	RAF	RDAF R	NLAF 9	NOAF	SAF	SKAFL	ISAFE
Period								88-96	90-96	77-95	79-95	94-97	90-96	8396	94-97	80-95	88-94	78-97	85-95	75-95	93-95	85-92
Years								9	7	19	17	4	7	14	4	18	7	22	11	21	3	8
Records							33418	764	215	3144	8504	. 77	950	2466	29	10595	312	3413	340	187	58	2264
nctime known		80,0	27,8	34,8	0,0	100,0	82,3	67,4	100,0	99,4	76,7	100,0	63,7	0,0	100,0	97,3	94,9	95,1	88,5	86,6	41,4	88,8
Aircraft known	rec	91,3	26,4	28,9	0,0	100,0	91,8	70,0	100,0	100,0	100,0	100,0	8,00	0,0	100,0	99,7	99,7	100,0	100,0	100,0	100,0	100,0
AC-type known	100	98,0	4,0	4,1	85,2	100,0	99,5	90,7	100,0	100,0	99,5	97,4	100,0	98,3	86,2	99,9	99,7	100,0	100,0	98,4	100,0	100,0
Aicraft ?? but type known	rec	8,0	25,5	320,4	0,0	98,3	7,8	20,8	0,0	0,0	0,0	0,0	0,2	98,3	0,0	0,3	0,0	0,0	0,0	0,0	0,0	0,0
Speed known	fec	69,7	25,9	37,2	0,0	97,9	63,0	77,7	57,7	86,4	47,9	95,1	78,6	0,0	96,6	75,1	73,1	68,3	81,2	97,9	36,2	72,5
Altitude known	ted	76,0	13,5	17,8	48,0	98,4	67,2	70,4	77,2	81,6	48,0	95,1	71,5	71,2	96,6	74,5	71,2	67,7	81,8	98,4	62,1	71,2
Speed + altitude known	rec	66,8	25,9	38,8	0,0	97,9	60,4	69,4	56,7	79,8	45,1	98,1	70,3	0,0	96,6	73,7	70,8	67,5	77,9	97,9	31,0	69,4
ocation given	rec	63,2	32,6	51,6	0,0	98,7	69,0	48,8	66,5	0,0	79,8	96,7	77,1	72,5	89,7	90,5	23,1	85,5	85,6	85,0	44,8	0,0
ocation + latLong given	tec	26,2	27,7	105,8	0,0	74,8	32,5	16,6	44,7	0,0	74,8	0,0	47,8	0,0	0,0	15,1	20,2	51,8	69,4	52,9	0,0	0,0
Total LatLong given	teo	38,5	31,9	83,0	0,0	82,6	40,1	43,1	44,7	0,9	75,3	0,0	49,4	0,0	3,4	15,3	74,4	56,2	71,8	59,9	0,0	82,6
Flightpase unknown	rec	18,9	10,5	55,6	3,9	34,5	25,8	18,2	10,7	16,9	32,6	3,9	18,8	14,7	10,3	25,7	26,6	30,6	6,5	4,3	34,5	30,1
Flightphase known	I/oc	81,1	10,5	13,0	65,5	96,1	74,2	81,8	89,3	83,1	67,4	96,1	81,4	85,3	89,7	74,3	73,4	69,4	93,5	95,7	65,5	69,9
One code given	rec	77,3	10,6	13,7	62,9	94,1	71,1	78,9	83,7	62,9	67,4	92,2	80,0	75,7	89,7	74,3	70,2	66,8	91,5	94,1	65,6	69,8
Two codes given	rec	3,5	5,3	151,2	0,0	20,1	3,1	2,9	5,6	20,1	0,0	3,9	1,3	0,6	0,0	0,0	2,9	2,4	2,1	1,6	0,0	0,1
Three codes given	rec	0,0	0,1	197,6	0,0	0,3	0,0	0,0	0,0	0,1	0,0	0,0	0,1	0,0	0,0	0,0	0,3	0,1	0,0	0,0	0,0	0,0
TAX	codes	0,6	0.8	130.5	0.0	2,7	1.1	0.8	0.0	0,6	2,7	0.0	1,5	1.8	0.0	0.3	0.8	0.5	0.3	0.0	0.0	0.0
OF	codes	11,5	4,3	37,9	5,1	19,7	10,2	9,1	5,4	5,1	7,0	6,5	11,7	17,4	15,4	10,8	14,2	12,5	19,7	13,7	10,5	13,0
CLI	codes	2,6	2,1	77,9	0,0	7,9	1,5	1,5	2,5	2,0	2,2	1,3	2,7	0,0	3,8	0,3	3,3	1,7	6,2	1,6	7,9	2,7
LE	codes	38,4	23,6	61,3	4,3	77,9	49,7	57,8	20,6	27,8	67,8	77,9	23,3	4,3	46,2	63,7	10,4	51,1	5,8	43,4	23,7	53,0
CRU	codes	18,2	19,0	104,4	0,0	52,2	14,7	1,1	36,8	51,1	0,0	9,1	33,8	52,2	3,8	2,2	34,6	3,0	27,1	11,0	0,0	7,6
łOL	codes	3,0	7,4	243,7	0,0	28,9	0,6	0,9	2,9	0,0	0,1	0,0	2,7	0,0	0,0	0,8	1,3	0,6	0,6	6,6	28,9	0,0
DES	codes	1,5	1,6	101,7	0,0	5,3	0,9	8,0	2,0	3,5	0,0	0,0	1,0	1,6	3,8	0,2	0,0	1,0	0,6	2,2	5,3	1,2
AP	-codes	8,7	4,9	56,3	0,0	16,0	9,9	12,7	4,9	4,0	13,7	0,0	10,4	2,7	15,4	11,3	9,2	10,6	16,0	8,2	2,6	9,2
AN	codes	12,6	7,4	58,7	3,5	25,8	8,4	13,4	24,0	5,0	6,4	5,2	10,7	20,1	3,8	3,5	25,8	12,6	20,6	8,8	15,8	13,4
GO	codes	2,7	2,8	102,3	0,0	7,7	3,1	1,9	1,0	1,0	0,2	0,0	2,3	0,0	7,7	6,0	0,4	6,4	3,1	4,4	5,3	0,0
otal Flightphase codes							100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
CRU or LLE	phase known	57,3	15,8	27,6	23,7	87,8	64,9	60,5	55,2	78,2	67,8	87,8	57,7	62,8	50,0	65,9	45,0	55,8	33,6	55,3	23,7	60,7
AP or LAN	phase known	22,1	8,3	37,3	6,4	37,4	18,9	26,7	30,2	15,0	20,1	5,4	21,1	25,4	19,2	14,7	35,8	22,7	37,4	17,3	18,4	22,6
OF	phase known	11,0	4,5	37.7	5.7	20.1	10,6	9,4	5.7	6.3	7.0	6.8	11,9	19,3	15,4	10.8	14,8	13,0	20,1	14,0	10,5	13,0

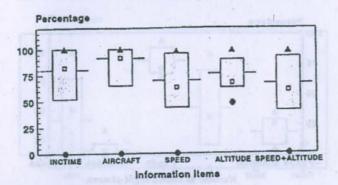
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							EUR	BASE	perce	ntages											Page 2	2
	100%	AVE	STDV	%sdev	MIN	MAX	TOTAL	BAF	CZAF	FAF	GAF	HAF	IAF	ISRAF	POAF	RAF	RDAF F	RNLAF	NOAF	SAF	SKAF	JSAFE
Operational effects unk	rec	38,6	40,2	104,1	0,0	100,0	45,6	2,1	27,0	26,0	100,0	100,0	60,9	100,0	89,7	19,8	0,6	3,9	0,3	35,8	0,0	13,4
No operational effects	rec	41,5	29,2	70,4	0,0	74,4	29,2	60,2	58,6	74,0	0,0	0,0	19,8	0,0	10,3	25,2	64,4	59,6	74,4	40,6	74,1	61,0
Aborted take-off	rec	2,0	2,7	131,1	0,0	8,8	1,4	2,1	0,9	0,0	0,0	0,0	1,3	0,0	0,0	3,1	1,6	1,6	8,8	5,9	5,2	0,0
Returned to base	100	8,2	7,8	95,2	0,0	21,6	6,1	8,0	9,8	0,0	0,0	0,0	3,6	0,0	0,0	6,5	16,3	18,1	5,9	17,1	15,5	21,5
Landed nearest airbase	100	9,0	13,2	146,4	0,0	46,3	17,7	27,4	3,7	0,0	0,0	0,0	3,9	0,0	0,0	46,3	17,0	16,9	10,0	0,5	5,2	4,0
Ditto and base given	tec	2,9	4,6	160,6	0,0	16,7	2,3	6,0	2,3	0,0	0,0	0,0	1,6	0,0	0,0	0,0	8,7	16,7	3,8	0,5	0,0	3,7
Crash	rec	0,1	0,2	265,8	0,0	0,6	0,0	0,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,6	0,0	0,0	0,0
BS noticed by unknown	rec	45,4	39,6	87,3	0,5	100,0	57,9	10,1	27,0	100,0	100,0	97,4	29,5	17,2	66,2	39,3	9,6	0,5	45,9	15,0	3,4	100,0
BS noticed by: Gr. crew	tec	14,0	14,9	106,5	0,0	48,3	8,6	16,1	27,0	0,0	0,0	2,6	8,6	6,3	8,3	8,7	28,2	39,2	9,1	5,9	48,3	0,0
BS noticed by: Pilot	tec	40,7	30,5	76,0	0,0	79,1	33,5	73,8	46,0	0,0	0,0	0,0	61,9	74,6	6,9	52,1	61,9	60,3	45,0	79,1	48,3	0,0
Impactpoint(s) unknown	100	29,9	36,6	122,3	0,0	100,0	18,4	4,8	27,0	53,6	1,0	97,4	12,3	100,0	86,2	11,9	4,8	2,6	5,3	35,3	0,0	6,7
Impactpoint(s) known	rec	70,1	36,6	52,2	0,0	100,0	81,6	95,2	73,0	46,4	99,0	2,6	87,7	0,0	13,8	88,1	95,2	97,4	94,7	64,7	100,0	93,3
One impactpoint given	rec	58,5	31,4	53,6	0,0	97,1	71,6	73,4	55,3	39,5	97,1	2,6	79,5	0,0	13,8	72,4	76,9	75,9	70,9	47,1	84,6	88,6
Two impactpoints given	100	9,1	6,9	75,7	0,0	17,6	8,1	16,9	16,3	6,1	1,8	0,0	6,4	0,0	0,0	12,5	16,7	16,6	17,6	14,4	8,6	4,0
Three impactpoints given	teo	1,7	1,5	93,4	0,0	4,7	1,5	3,4	1,9	0,7	0,0	0,0	1,5	0,0	0,0	2,5	1,6	3,5	4,7	1,1	3,4	0,5
Four impactpoints given	rec	0,8	1,0	130,7	0,0	3,4	0,5	1,4	0,5	0,1	0,0	0,0	0,3	0,0	0,0	0,8	0,0	1,4	1,5	2,1	3,4	0,1
Impactpoint:								0443	4													
RAD	pnts	8,7	6,5	96,5	0,0	25,0	7,7	8,1	0,5	0,0	11,9	0,0	9,3		25,0	5,6	4,2	6,6	4,9	6,7	1,4	9,7
NOS	pnts	6,2	5,4	86,0	0,0	15,4	9,0	8,3	5,0	0,0	1,8	0,0	11,6		0,0	15,4	8,4	12,1	4,9	13,4	1,4	4,9
WIN	pnts	14,1	11,8	83,6	0,0	50,0	13,5	8,5	14,9	0,0	10,2	0,0	10,0		50,0	18,9	12,5	10,2	14,7	14,0	15,1	16,3
ROT	pnts	2,2	1,8	80,7	0,0	6,5	2,5	1,7	2,5	0,6	3,1	0,0	0,6		0,0	3,0	3,1	2,1	5,4	2,4	5,5	0,5
AIT	pnts	10,9	10,0	91,7	0,0	28,9	6,2	6,2	28,9	20,3	6,8	0,0	22,8		0,0	2,4	13,1	3,0	5,4	7,3	27,A	8,5
POW	pnts	22,5	23,1	102,4	5,4	100,0	16,2	24,5	16,9	24,3	19,7	100,0	5,4		25,0	13,1	10,9	16,5	21,2	9,8	15,1	13,2
CAN	pnls	17,1	8,0	46,7	0,0	26,2	21,3	20,9	16,9	18,4	22,5	0,0	20,9		0,0	21,3	15,9	19,7	14,0	26,2	17,8	25,4
FUS	pots	10,5	6,3	59,7	0,0	26,7	13,0	9,1	8,0	26,7	13,9	0,0	13,0		0,0	12,0	10,0	11,1	12,6	10,4	11,0	9,9
LAN	prits	4,8	4,4	90,6	0,0	14,0	3,5	7,7	6,0	1,5	4,2	0,0	4,1		0,0	0,7	12,0	7,7	14,0	6,1	1,4	2,3
EMP	pnts	1,5	1,1	72,4	0,0	3,5	2,0	1,9	0,5	3,5	1,3	0,0	0,9		0,0	2,7	2,2	1,4	1,2	0,6	2,7	1,6
UST	pnts	3,4	3,0	87,1	0,0	9,7	5,2	3,0	0,0	4,5	4,4	0,0	1,4		0,0	4,7	7,8	9,7	1,9	3,0	1,4	5,8
Total impactpoints	pnts	100,0					100,0	100,0	100,0	100,0	100,0	100,0	100,0		100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

							EUF	BASE	perce	ntages										1	Page 3	
	100%	AVE	STDV	%sdev	MIN	MAX	TOTAL	BAF	CZAF	FAF	GAF	HAF	IAF	ISRAF	POAF	RAF	RDAF F	NLAF 3	NOAF	SAF	SKAF U	JSAF
Damage=NO, points given	100	2,9	9,2	313,2	0,0	35,6	3,7	0,0	0,0	0,0	0,0	0,0	5,2	35,6	0,0	2,8	0,3	0,0	0,0	0,0	0,0	0
Damage=YES, no points	100	1,0	2,7	264,2	0,0	10,2	1,4	0,1	0,0	0,0	0,0	0,0	0,2	0,0	0,0	4,1	0,6	0,0	0,3	10,2	0,0	0
Remaining valid cases	tec	96,0	9,3	9,7	64,4	100,0	95,0	99,9	100,0	100,0	100,0	100,0	94,6	64,4	100,0	93,2	99,0	100,0	99,7	89,8	100,0	10
Damage=No	valid cases	63,8	20,7	32,4	0,0	86,2	63,5	72,0	68,4	0,0	78,7	71,4	56,2	66,3	44,8	68,1	79,0	81,3	68,7	66,7	60,3	8
Damage= Unknown	valid cases	2,9	4,6	157,9	0,0	16,5	2,4	1,2	0,9	10,5	0,0	0,0	15,5	6,9	0,0	1,7	1,0	0,0	3,5	0,6	1,7	
Damage=Yes	valid cases	33,3	18,5	55,4	13,8	89,5	34,0	26,0	30,7	89,5	21,3	28,6	28,4	27,8	65,2	40,2	20,1	18,7	27,7	32,7	37,9	1
Damagepoints Unknown	damyee	24,3	35,9	147,6	0,0	100,0	20,3	0,5	18,7	48,2	1,4	90,9	3,1	100,0	75,0	6,4	0,0	0,2	2,1	0,0	0,0	2
Damagepoints known	damyes	75,7	35,9	47,5	0,0	100,0	79,7	99,5	83,3	51,8	98,6	9,1	96,9	0,0	25,0	93,6	100,0	99,5	97,9	100,0	100,0	1
One damagepoint given	demyes	68,6	32,6	47,4	0,0	97,7	75,4	88,8	77,3	44,1	97,7	9,1	92,5	0,0	25,0	92,0	90,3	87,9	90,4	80,0	81,8	
Two damagepoints given	demyes	6,4	6,2	96,6	0,0	20,0	3,6	6,3	6,1	8,9	1,0	0,0	4,3	0,0	0,0	1,2	9,7	9,7	6,4	20,0	18,2	
Three damagepoints given	damyes	0,5	0,9	184,0	0,0	3,4	0,5	3,4	0,0	0,7	0,0	0,0	0,0	0,0	0,0	0,2	0,0	1,6	1,1	0,0	0,0	
Four damagepoints given Damagepoint:	damyes	0,2	0,3	191,9	0,0	1,0	0,1	1,0	0,0	0,1	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,6	0,0	0,0	0,0	
RAD	pnts	5,7	6,6	115,1	0,0	25,0	4,4	4,2	0,0	0,0	10,7	0,0	7,8		25,0	2,5	2,9	6,2	0,8	4,5	0,0	
NOS	pnts	6,2	5,7	91,9	0,0	15,3	8,5	11,8	5,1	0,0	1,0	0,0	11,2		0,0	15,3	11,8	12,3	4,0	10,6	0,0	
VIN	pnte	18,2	13,6	74,3	0,0	50,0	15,6	10,5	32,2	0,0	16,8	0,0	18,2		50,0	22,5	7.4	6,6	15,0	24,2	23,1	
ROT	pnts	1,8	1,7	99,0	0,0	5,1	1,4	4,6	5,1	8,0	1,9	0,0	0,8		0,0	1,3	2,9	1,0	2,0	0,0	3,8	
UT	pnts	7,7	7,2	93,1	0,0	22,1	7,1	8,4	6,6	20,3	3,6	0,0	22,1		0,0	1,8	10,3	7,0	6,0	0,0	15,4	
POW	pnts	32,1	21,5	67,0	9,3	100,0	22,7	27,8	39,0	24,3	24,7	100,0	9,3		25,0	19,3	22,1	30,4	36,0	21,2	46,2	1
CAN	pnte	8,5	6,0	67,5	0,0	18,4	13,5	8,0	1,7	18,4	13,0	0,0	10,9		0,0	13,2	8,8	11,4	9,0	18,2	3,8	
US	pnts	9,4	6,5	69,5	0,0	26,7	14,0	10,1	6,8	26,7	12,9	0,0	12,4		0,0	11,2	11,8	8,6	11,0	7,6	3,8	
AN	pnts	3,0	2,5	85,7	0,0	7,8	1,8	5,1	3,4	1,5	3,5	0,0	4,3		0,0	0,4	7,4	2,9	4,0	7,6	0,0	
MP	pnts	2,1	1,7	81,4	0,0	4,4	2,9	4,2	0,0	3,5	2,5	0,0	0,8		0,0	3,2	4,4	1,9	0,0	1,5	3,8	
JST	pnts	5,0	4,2	83,6	0,0	11,5	8,1	5,1	0,0	4,5	9,6	0,0	2,3		0,0	9,1	10,3	11,8	5,0	4,5	0,0	
Total damagepoints	pnts	100,0					100,0	100,0	100,0	100,0	100,0	100,0	100,0		100,0	100,0	100,0	100,0	100,0	100,0	100,0	1
AC tights unknown	tec	68,5	35,1	51,3	12,8	100,0	82,0	100,0	33,0	100,0	100,0	100,0	61,9	100,0	100,0	83,3	15,1	56,7	98,8	12,8	44,8	
AC lights known	rec	31,5	35,1	111,6	0,0	87,2	18,0	0,0	67,0	0,0	0,0	0,0	38,1	0,0	0,0	16,7	84,9	43,3	1,2	87,2	55,2	
AC lights OFF	100	12,3	16,4	133,5	0,0	63,5	5,2	0,0	11,2	0,0	0,0	0,0	12,6	0,0	0,0	2,4	34,6	18,2	0,3	53,5	29,3	
AC lights ON	tec	19,2	21,7	113,0	0,0	56,2	12,7	0,0	55,8	0,0	0,0	0,0	25,5	0,0	0,0	14,4	50,3	25,1	0,9	33,7	20,9	1
AC radar unknown	rec	84,5	25,2	29,9	15,5	100,0	91,1	100,0	69,8	100,0	100,0	100,0	66,8	100,0	100,0	81,7	100,0	88,7	100,0	15,5	46,6	10
AC radar known	rec	15,5	25,2	162,4	0,0	84,5	8,9	0,0	30,2	0,0	0,0	0,0	33,2	0,0	0,0	18,3	0,0	13,3	0,0	84,5	53,4	
AC radar OFF	tec	11,9	21,3	178,2	0,0	67,9	5,8	0,0	N CONTRACT	0,0	0,0	0,0	21,8	0,0	0,0	13,3	0,0	4,2	0,0	67,9	53,4	
C radar ON	160	3,6	5,7	159,1	0,0	16,6	3,0	0,0	11,6	0,0	0,0	0,0	11,4	0,0	0,0	5,1	0,0	9,1	0,0	16,6	0,0	

							EUR	BASE	perce	ntages										-	Page 4	6
	100%	AVE	STDV	%edev	MIN	MAX	TOTAL	BAF	CZAF	FAF	QAF	HAF	IAF	ISRAF	POAF	RAF	RDAF	ANLAF A	NOAF	SAF	SKAFL	USAF
Lightconditions unknown	rec	41,0	36.2	88.2	0.0	100,0	50,4	13.1	0,0	6,7	90,9	89,6	55,9	9,9	82,8	34,8	1,0	52,7	0,9	36,9	39,7	100,0
Lightconditions known	180	59.0	36.2	61,3	0,0	100,0	49,6	86,9	100,0	93,3	9,1	10,4	44,1	90,1	17.2	65,2	99,0	47,3	99,1	63,1	60,3	0,0
DAWN	rec	0.2	0,4	154,7	0,0	1,3	0,1	0,0	0,0	0,0	0,0	0,0	1,3	0,3	0,0	0,1	0,6	0,3	0,3	0,5	0,0	0,
CONTAIN THE PARTY OF THE PARTY	Lec	53,0	32,2	8,08	0,0	93,3	44.7	82.7	84,7	88,3	8,3	10,4	39,3	65,0	17,2	60,9	93,3	44,1	91,2	61,5	50,0	0,
DUSK	rec	1,0	1,8	175,0	0,0	6,9	0,5	0,5	0,5	0,0	0,0	0,0	0,5	2,7	0,0	0,4	0.3	0,6	2,4	0,5	6,0	0,
NIGHT	100	4,8	6,1	128,2	0,0	22,0	4,3	3,7	14,9	7,0	0,8	0,0	2,7	22,0	0,0	3,8	4,8	2,3	5,3	0,5	3,4	0,
					-			-				-		14.4	6,9	20.6	23,4	28,4	10,3	1,6	29.3	23
LOCENR unknown	rec	17,2	9,8	56,6	1,6	35,6	24,2	17,3	9,8	16,9	35,6	3,9	17,1	10000	0.00	1100	76,6	71,6	89,4	95,4	70,7	76
LOCENR known	rec.	82,7	9,7	11,8	64,4	98,4	76,8	82,7	90,2	83,1	64,4	96,1	82,9	85,6	93,1	79,4	10.1155	The same of the sa	110000	190523561	27,6	27
LOCENR=LOC	100	30,7	11,1	36,0	11,7	57,4	24,2	29,2	35,3	18,0	17,2	11,7	34,5	31,1	41,4	24,1	37,5	31,1	57,4	36,9	- 1000000	- P. C.
LOCENR=ENR	100	52,0	12,4	23,8	32,4	84,4	51,6	53,5	54,9	65,2	47,2	84,4	48,4	54,4	51,7	55,3	39,1	40,6	32,4	61,5	43,1	49
Remains, LAB, Spec. known	spec known	22,0	27,1	123,5	0,0	75,2	26,0	34,3	1,5		0,0		0,0	72,7	0,0	8,4	45,9	75,2	11,9	0,0	22,2	13
Remains, BCU, Spec. known	spec known	11,3	17,6	154,5	0,0	66,1	8,4	0,7	56,1		0,0		0,0	26,3	0,0	9,0	0,0	16,2	0,0	5,3	33,3	0
Remains, GRD, Spec. known	spec known	1,6	1,8	112,2	0,0	5,6	1,2	1,0	3,0		0,0		4,5	0,0	0,0	9,0	0,8	3,0	1,0	1,3	5,6	
Remains, PIL, Spec, Known	spec known	2,6	4,3	164,0	0,0	13,6	1,1	0,0	13,6		0,0		9,1	0,0	0,0	1,9	1,5	0,8	0,0	1,3	5,6	
Remains, UNK, Spec, Known	spec known	16,2	26,9	100,4	0,0	94,8	28,5	38,7	0,0		94,8		8,0	0,0	0,0	1,3	29,5	0,9	19,7	7,9	16,7	
Total Remains, Spec. Known	spec known	53,7	37A	69,7	0,0	99,1	65,2	74,7	74,2		94,8		14,4	99,1	0,0	21,6	77,9	96,0	32,6	15,8	83,3	12
No remains, PIL, Spec, known	anac known	9,0	11,3	126,0	0,0	31,8	2,6	4,7	16,7		0,0		31,8	0,0	0,0	2,6	8,2	2,5	3,6	30,3	16,7	
No remains, OTH, Spec. known		3,6	4,5	127.2	0,0	13,1	2,1	1,7	3,0		0,0		7,8	0,9	0,0	4,6	13,1	0,6	3,1	11,8	0,0	
Total No remains, Spec. Known		12,6	14,5	115,8	0,0	42,1	4,7	6,4	19,7		0,0		39,4	0,9	0,0	7,2	21,3	3,1	6,7	42,1	16,7	
Remains ???, Spec. Known	spec known	33,7	36,3	107,5	0,0	100,0	30,1	18,9	6,1		5,2		46,2	0,0	100,0	71,2	0,8	0,9	60,6	42,1	0,0	86
	A COLUMN TO SERVICE AND ADDRESS OF THE PARTY	-			0.0	70,6	30,1	38,9	30,7	0,0	32,0	0.0	13.9	17.4		31,1	39,1	70.6	56,8	40,6	31,0	1
Total Species known	rec	31,5	20,7	65,6	0,0	70,6	30,1	30,0	30,7	0,0	32,0	0,0	10,0	u.e	00,0	31,1	39,1	70,0	0,0	40,0	31,0	
Birdnumber unknown	tec	59,3	35,4	59,6	0,0	100,0	67,1	67,0	40,0	100,0	91,3	100,0	56,2	100,0	100,0	42,7	29,5	75,9	63,2	11,2	0,0	1
Birdnumber=SIN	100	32,0	29,5	92,1	0,0	93,1	25,9	23,2	49,8	0,0	6,0	0,0	37,6	0,0	0,0	48,4	52,2	16,4	24,4	61,0	93,1	7
Birdnumber=FLO	rea.	7,2	7,9	109,6	0,0	27,8	5,0	9,8	10,2	0,0	0,0	0,0	6,2	0,0		8,2		5,4	7,6	27,8	1,7	1
Birdnumber=figure	rec	1,5	1,8	125,0	0,0	5,2	2,0	0,0	0,0	0,0	2,7	0,0	0,0	0,0	0,0	2,7	2,6	2,2	4,7	0,0	5,2	
Bird type unknown	rec	55,7	34,5	61,9	2,5	100,0	84,5	33,9	29,3	100,0	93,5	2,6	32.2	82,6	79,3	86,3	27,8	80,7	14,7	17,6	55,2	10
Bird type S	rec	21,3	15,3	72.2	0,0	0.000	7,6	27,6	38,1	0,0	3,6	27,3	36,2	7,4	172	6,8	38,5	9,6	40,9	36,4	31,0	
Bird type M	100	19,1	17,9	93.9	0,0	100.5	6,2	34,0	23,7	0,0	2,1	58,4	26,8	7,8	3,4	4,9	35,3	7,5	38,8	33,2	10,3	
Bird type L	rec	4,0	4,2	105,6	0,0	200	1,7	4,5	8,8	0,0	0,8	11.7	4,7	2,1	0,0	1,0	0,6	2,2	5,8	12,8	3,4	
Daniela Cara Carad M			10.00		-	44,3		22,4	10,7	0,0	14,7	0,0	2,0	0,0	0,0	5,7	25,0	44,3	15,6	6,4	10,3	
Remains+Spec+Speed+Alt.	rec	10,5	1000	100000	0,0	24936	11,2	77.00	8.8	0,0	13.8	0,0		0,0		2,8	-	36,2	13,5	6,3	0,0	
Ditto and Latlong	100	7,8	10,63	136,7	0,0	36,2	8,9	9,7	0,8	0,0	13,8	0,0	1,4	0,0	0,0	2,0	24,4	20,2	19,0	0,0	0,0	

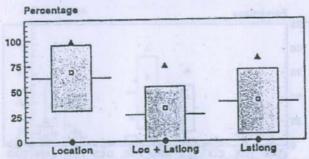
Basic information on bird strikes
Percentages from total number of bird strikes (33,418)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

Annex C2

Geographic information on bird strikes
Percentages from total number of bird strikes (33,418)

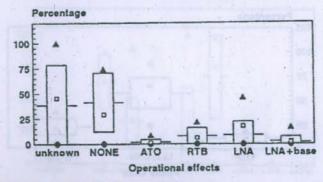


Type of geographic information

Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

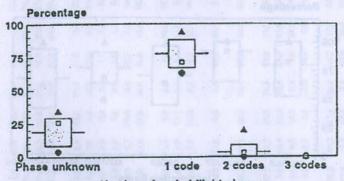
Annex C3

Information on operational effects
Percentages from total number of bird strikes (33,418)



Hor.line + bar; mean of 15 Air Forces + st. dev. Square; overall average Dot + triangle; minimum and maximum

Number of coded flight phases
Percentages from total number of bird strikes (33,418)

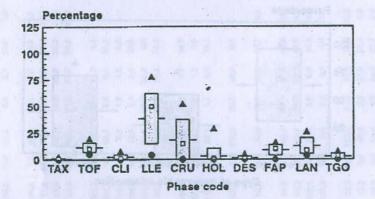


Number of coded flight phases

Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

Annex C5

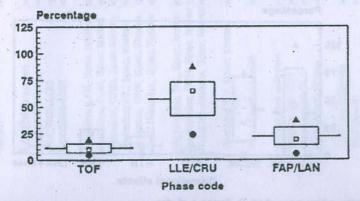
Distribution of registered flight phases
Percentages from total of registered codes (25,832)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

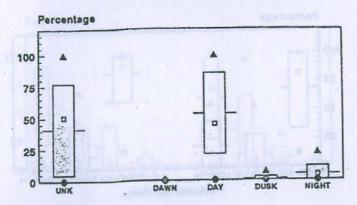
Annex C6

Distribution of some combined flight phases Percentages from total of registered codes (25,832)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

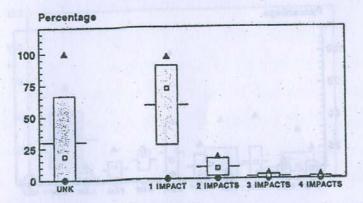
Information on daylight conditions
Percentages from total number of bird strikes (33,418)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

Annex C8

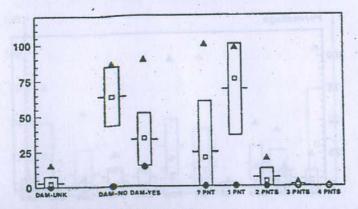
Information on impact
Percentages from total number of bird strikes (33,418)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

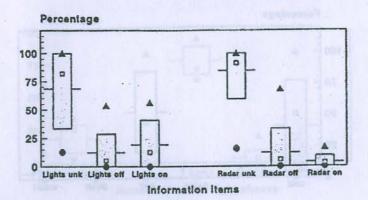
Annex C9

Information on damage
Percentages from valid records (31,741) or damagecases only (10,806)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

Information on AC-lights and AC-radar Percentages from total number of bird strikes (33,418)

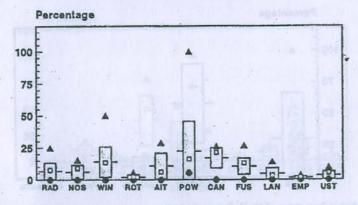


Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

Annex C11

Information on impactpoints

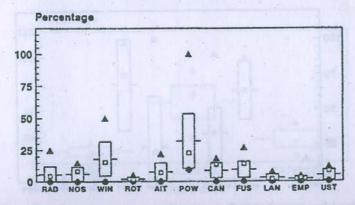
Percentages from total number of registered impactpoints (31,429)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

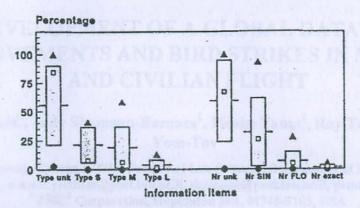
Annex C12

Information on damagepoints
Percentages from total number of registered damagepoints (9148)



Hor.line + bar: mean of 15 Air Forces + st, dev. Square: overall average Dot + triangle: minimum and maximum

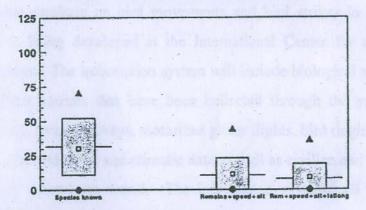
Information on bird type and bird number Percentages from total number of bird strikes (33,418)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

Annex C14

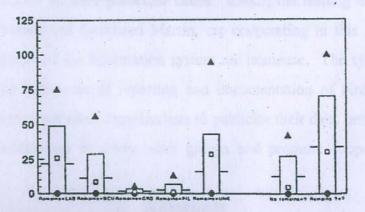
Bird species in combination with other information Percentages from total number of bird strikes (33,418)



Hor.line + bar: mean of 16 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum

Annex C15

Details on identification of birds
Percentages from bird strikes with known bird spec (10,074)



Hor.line + bar: mean of 15 Air Forces + st. dev. Square: overall average Dot + triangle: minimum and maximum