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SAMPLING METHODOLOGY DEVELOPED FOR PRELIMINARY SACDEF STUDY.(U)

JAN 80 M S HOFFMAN, G P CHUBB

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SAMPLING METHODOLOGY DEVELOPED FOR PRELIMINARY SACDEF STUDY

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AIR FORCE AEROSPACE MEDICAL RESEARCH LABORATORY

JANUARY 1980

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AMRL-TR-78-33

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This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER



CHARLES BATES, JR.
Chief
Human Engineering Division
Air Force Aerospace Medical Research Laboratory

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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20. Abstract (Cont'd)

→ Since these data were to be used for selecting a sample of crews from G model bases not having an Automated Offset Unit by February 1977, the overall crew force was broken down into four subgroups (G vs. H bases, with and without AOU) for some analysis.

An analysis of variance was performed using total flying hours as the dependent variable. Crew types (ready, lead, and select) were found to have statistically significant differences in flying hours for all contrasts. Bases which had AOU equipped G model aircraft were found to have a significantly larger number of total flying hours. Failure to reject the null hypothesis for non-AOU equipped G model bases was interpreted to imply that the sample from this sub-population would be representative of the overall crew force in terms of total flying hours.

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SUMMARY

The Strategic Avionics Crewstation Design Evaluation (SACDEF) Facility has been established to evaluate human engineering concepts for controls and displays design and for equipment layout for the electronic warfare and bombing navigation systems of the B-52. Combat ready Strategic Air Command crew members serve as the experimental subjects in these studies. The crew members are selected on a scientific basis using statistical sampling techniques.

This report documents the survey of navigators and radar navigators for the B-52 G and H that were combat ready as of July 1976. It explains the nature of the data collected, summarizes some of the analyses performed on these data, and identifies some of the problems encountered. Recommendations are made about the way the survey and selection procedures should be conducted in the future.

Some of these data summaries may be of interest for other purposes. Appendices have been included in this report to provide a variety of statistics computed from the crew survey data. As subsequent surveys are conducted, these statistics may provide a basis for observing trends in various attributes of the combat ready crew force, at least for the G and H models of the B-52.

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INTRODUCTION

This report describes the sample technique developed in support of a preliminary performance workload study using Strategic Air Command (SAC) navigator/radar navigator teams. The data were obtained from a crew survey initiated in the Spring of 1976. The crew data provided in this paper describe the combat ready crew force for B-52 G/H navigator/radar navigator teams as of July 1976.

This effort had two goals. The primary purpose was to choose a representative sample of combat ready SAC crews to serve as participants in the preliminary study of operator workload. The criterion used to define "representativeness" was selected on the basis of an extensive review of the demographic data from the entire crew force. This process also led to the identification of variables which could be eliminated in future surveys.

The secondary purpose of this effort was to create a data base for predicting performance proficiency from the data provided in response to the questionnaire. Given the actual performance data from the workload study, it would be desirable to learn what combination(s) of variables in the survey data best discriminate between various levels of crew performance. If these predictors were known, then data from future surveys could be used more efficiently to select a sample of crews which best represent distinguishable levels of proficiency.

The study for which these crews were selected was primarily an effort to pretest materials to be used in a much larger study late in 1977. This larger study will establish the "baseline" workload for each crew position (i.e., navigator and radar navigator) in an Automated Offset Unit (AOU) equipped, G-model, B-52 navigator/radar navigator study crew station. The preliminary study used a non-AOU G-model crew station configuration. It was therefore necessary to segment the crew force according to the AOU versus non-AOU equipped aircraft* and bases with G versus H model aircraft. Samples were then selected from that segment of the crew force using G model aircraft that were not AOU equipped by the time of the study (February, 1977).

* Non-AOU actually refers to those aircraft which would be AOU equipped only *after* the scheduled date for the preliminary study.

METHOD

Approach

A questionnaire (Figure 1) was distributed through channels to each B-52 bomb wing for completion by the SAC navigator/radar navigator crews. Twenty-four variables were identified per crew member (see Table 1 for data format and Appendix A for a listing of data). Seven variables served as identifiers for each crew. They were variables 1, 13, 19, 21, 22, 23 and 24. The data were coded using one card per crew member utilizing the coding conventions as shown in Table 2.

The first task in choosing the sample was to evaluate the distribution of each variable across all crews. A general software program HISLOG (see Appendix B) was used. This program calculated the mean, standard deviation, skewness, maximum value, minimum value and number of cases for each variable. There were other options available in the program, but it was felt that without a prior knowledge of the data the simplest analysis approach would prove to be the most useful.

After the initial run, it was decided that the crew members should be evaluated as a two-man team and only against other crew members with the same responsibility, (i.e., navigator compared against navigator and radar navigator against radar navigator). Therefore, the variables were redefined and several new variables were created as defined in Table 3, variables 45 through 64. These derived variables represent team data and are obtained by combining data items provided for each individual on the team. Because the navigator and radar navigator may differ in their degree of experience, mean values were calculated for variables 45-64 (see Table 3) to reflect an overall index of team experience. Variables 45-48 represented the total number of hours spent in three models of B-52 aircraft (D, G, and H) respectively.

TABLE 1

DATA INPUT FORMAT

(1X, F8.1, 4F9.1, 9X, 5F2.0, 7F1.0, F2.0, 2F1.0, F2.0, 1X, F2.0)

Field	Content Description	Card Columns
1	AOU or Non-AOU	1- 1x
2	Hours spent in Model D aircraft	2- 9 - F8.1
3	Hours spent in Model G aircraft	10-18
4	Hours spent in Model H aircraft	19-27
5	Hours spent with SRAM	28-36
6	Hours spent with EVS	37-34
7	Subject's last name	46-54 - 9x
8	Rank	55-56
9	Age	57-58
10	Instructor's Status	59-60
11	Number of months on team	61-62
12	Number of re-assignments	63-64
13	Unit's proficiency rating	65
14	Positions held in D aircraft	66
15	Positions held in G aircraft	67
16	Positions held in H aircraft	68
17	Positions held with SRAM	69
18	Positions held with EVS	70
19	Air Force Base	71
20	Subject Number	72-73 - F2.0
21	Mini team	74
22	Team type (E = 0, R = 1, S = 2)	75
23	Crew number	76-77 - F2.0
24	Air Force Base	79-80 - F2.0

* Recommend recoding as: (R = 1, E = 2, and S = 3)

Instructions: Complete this questionnaire only for integral N/RN teams currently in mission ready status on numbered crews.

Unit _____ Crew Number _____ Mini-Team: Yes _____ No _____

Part 1: Navigator

Name: _____
Last First Initial

Current Rank (01-05): _____ 1 = Stanboard
Age to nearest year: _____ 2 = Line Instructor
Instructor Status: _____ 3 = Non-Instructor
(1, 2, or 3)

B-52 Flying Time by Model and Position

Model	Total Time	Position (N, RN or both)
B-52D	_____	_____
B-52G	_____	_____
B-52H	_____	_____

(hours)

Total B-52 flying time - SRAM equipped: _____ hours
Total B-52 flying time - EVS equipped: _____ hours
Number of months on present team: _____ months
Total number of team assignments: _____
Current In-Unit Proficiency Level: (1, 2, or 3): _____

Part 2: Radar Navigator

Name: _____
Last First Initial

Current Rank (01-05): _____ 1 = Stanboard
Age to nearest year: _____ 2 = Line Instructor
Instructor Status: _____ 3 = Non-Instructor
(1, 2, or 3)

B-52 Flying Time By Model and Position

Model	Total Time	Position (N, RN or both)
B-52D	_____	_____
B-52G	_____	_____
B-52H	_____	_____

(hours)

Total B-52 Flying Time - SRAM equipped: _____ hours
Total B-52 Flying Time - EVS equipped: _____ hours
Number of months on present team: _____ months
Total number of team assignments: _____
Current In-Unit Proficiency Level (1, 2, or 3): _____

Figure 1. B-52G/H Navigator/Radar Navigator Data Questionnaire

TABLE 2
CODING CONVENTIONS

Field	Content	Description	Code Used
1.	AOU	Bases with AOU	1
		Bases without AOU	0*
7.	Rank	2nd Lt	1
		1st Lt	2
		Capt	3
		Lt. Col.	4
		Col	5
9.	Instructor's Status	Non-instructor	3
		Line-instructor	2
		Standboard	1
13-17.	Positions	Navigator	1
		Radar Navigator	2
		Both	3
19.	Air Force	East - 8th A.F.	0*
		West - 15th A.F.	1
21.	Mini Team Member	Yes	1
		No	0*
22.	Crew Type**	E	0*
		R	1
		S	2
24.	Air Force Base	68th BW	1
		42nd BW	2
		320th BW	3
		92nd BW	4
		97th BW	5
		410th BW	6
		28th BW	7
		319th BW	8
		5th BW	9
		416th BW	10
		19th BW	11
		449th BW	12
		2nd BW	13
		379th BW	14

* Zeroes should not be used if BMD05-D programs will be exercised. Recode as 1,2,3 (as appropriate) instead.

** Recommend recoding as follows: (R = 1, E = 2, S = 3).

BMD01D was used to compute general statistics (mean, sigma, range, Maximum X, Minimum X, sample size, and the standard error of the mean for the population (Appendix C) and BMD02D was used to compute a correlation matrix (Appendix D). The set of BMD analysis routines are described in Dixon (1968). BMD01D also serve as a check that the input data for BMD02D and HISLOG were in the correct order.

The computer output listings for all runs using the BMD routines comprise two separate binders referred to here as Supplements I and II, respectively. Selected contents have been extracted from these listings and included in this report. In some cases, results are discussed that treat specific issues which did not appear important enough to warrant transcription for inclusion in this report. The interested reader is referred to the appropriate section of the Supplements where these results are documented. Since there is only one copy of the Supplements, readers interested in copies of specific information may address their request to the authors.

TABLE 3

DEFINITIONS OF VARIABLES PER CREW

Variable Number

1	Hours spent in D model aircraft by navigator
2	Hours spent in G model aircraft by navigator
3	Hours spent in H model aircraft by navigator
4	Hours spent in SRAM equipped aircraft by navigator
5	Hours spent in EVS equipped aircraft by navigator
6	Navigator's rank (1-5)
7	Navigator's age
8	Navigator's instructor rating (1, 2 or 3)
9	Number of months on current team
10	Number of reassignments
11	Team's proficiency rating (1, 2 or 3)
12	Positions held in D aircraft by navigator
13	Positions held in G aircraft by navigator
14	Positions held in H aircraft by navigator
15	Positions held in SRAM equipped aircraft by navigator
16	Positions held in EVS equipped aircraft by navigator
17	Air Force I.D. number (1 or 2)
18	Subject number (odd numbered sequence)
19	Mini-team member (1 = yes, 0 = no)
20	Team type (E = 0, R = 1, S = 2)
21	Team number
22	Base number
23	Hours spent in D model aircraft by radar navigator
24	Hours spent in G model aircraft by radar navigator
25	Hours spent in H model aircraft by radar navigator
26	Hours spent in SRAM equipped aircraft by radar navigator
27	Hours spent in EVS equipped aircraft by radar navigator
28	Radar navigator's rank
29	Radar navigator's age
30	Radar navigator's instructor rating
31	Number of months on current team
32	Number of reassignments
33	Unit's proficiency rating (1, 2 or 3)
34	Positions held in D aircraft by radar navigator
35	Positions held in G aircraft by radar navigator
36	Positions held in H aircraft by radar navigator
37	Positions held in SRAM equipped aircraft by radar navigator
38	Positions held in EVS equipped aircraft by radar navigator
39	Air Force I.D. number (1 or 2)
40	Subject number (even numbered sequence)
41	Mini-team member (1 = yes, 0 = no)
42	Team type (E = 0, R = 1, S = 2)
43	Team number
44	Base number
45	Hours in G and H aircraft by navigator: vars $X_1 + X_2 - X_{15}$
46	Total flying hours by navigator: vars $X_1 + X_{15} - X_{16}$
47	Hours in G and H aircraft by radar navigator: vars $X_{21} + X_{25} - X_{17}$
48	Total flying hours by radar navigator: vars $X_{21} + X_{17} - X_{18}$
49	Team's average flying hours in D aircraft: vars $(X_1 + X_{15})/2 - X_{19}$
50	Team's average flying hours in G aircraft: vars $(X_2 + X_{21})/2 - X_{20}$
51	Team's average flying hours in H aircraft: vars $(X_3 + X_{25})/2 - X_{21}$
52	Team's average hours in SRAM equipped aircraft: vars $(X_4 + X_{26})/2 - X_{22}$
53	Team's average hours in EVS equipped aircraft: vars $(X_5 + X_{27})/2 - X_{23}$
54	Team's average rank: vars $(X_6 + X_{28})/2 - X_{24}$
55	Team's average age: vars $(X_7 + X_{29})/2 - X_{25}$
56	Team instructor ratings: vars $X_8 + X_{30} - X_{26}$
57	Average months on current assignment per team: $(X_9 + X_{31})/2 - X_{27}$
58	Average number of reassignments per team: $(X_{10} + X_{32})/2 - X_{28}$
59	Unit's proficiency rating: vars $X_{11} + X_{33} - X_{29}$
60	Team's positions in D aircraft: vars $X_{12} + X_{34} - X_{30}$
61	Team's positions in G aircraft: vars $X_{13} + X_{35} - X_{31}$
62	Team's positions in H aircraft: vars $X_{14} + X_{36} - X_{32}$
63	Average team hours in G and H aircraft: vars $(X_{15} + X_{17})/2 - X_{33}$
64	Average team total flying hours: vars $(X_{16} + X_{18})/2 - X_{34}$

The three software programs (BMD01D, BMD02D and HISLOG) were run under the following strata (see Supplements I and II):

<i>Strata</i>	<i>Supplement</i>	<i>Sample Size</i>
1. All Crews*	I	269
2. Bases With H Model Aircraft	I	102
3. Bases With G Model Aircraft	I	167
4. Ready Teams (R)	I	150
5. Lead Teams (E)	I	72
6. Select Teams (S)	I	47
7. H Bases With AOU	II	64
A. Ready Teams	II	This sort by team type occurred within each base type (Strata 8, 9, and 10)
B. Lead Teams	II	
C. Select Teams	II	
8. H Bases Without AOU	II	38
9. G Bases With AOU	II	54
10. G Bases Without AOU	II	113

* Five crew members were eliminated because they had not been assigned to a crew at the time this survey was conducted.

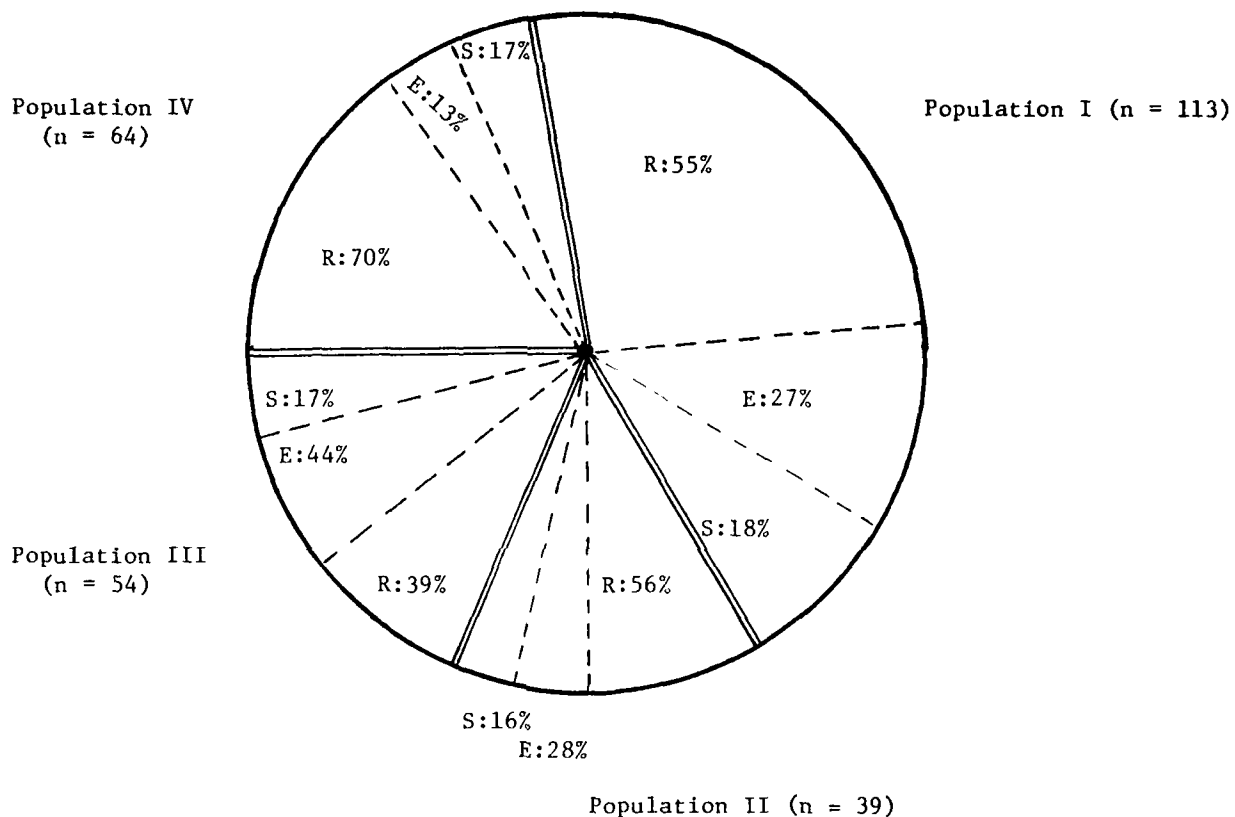
Theoretical Issues

Data used to define the proficiency of the B-52 navigator/radar navigator population should describe the distribution of experience related variables encountered when selecting candidate variables as sampling indexes. The variables must be useful as predictors of performance proficiency, (i.e., combat readiness at some point in time). Changes in the population created by reassignment, retirement, training, and other factors alter the population's characteristics as time passes. The variable(s) used as a performance predictor may therefore lose accuracy due to time lags between sample selection and the commencement of data collection for the experiment.* Therefore, it is important that the sampling index and variables used as performance predictors represent relatively stable measures. A second problem is in defining "representativeness." Also, sampling procedures and sample size are influenced or driven by practical constraints (time, money, etc.). These constraints can work against any attempt to make the sample representative of the population. The bias induced by "sampling error" cannot be assessed. Random selection is designed to preclude systematic bias but does not guarantee accurate predictions. There are other techniques for trying to pick a "representative" sample that are more systematic than simple random sampling. The choice of an appropriate technique should therefore be addressed.

Two additional constraints limited the population from which the sample for this preliminary study was chosen. First, the AOU equipment was being installed throughout the fleet and secondly, the AOU implementation schedule was such that three out of five bases with H model aircraft would have AOU installed at the commencement of the preliminary study. This study was to be run in a non-AOU configured crewstation.

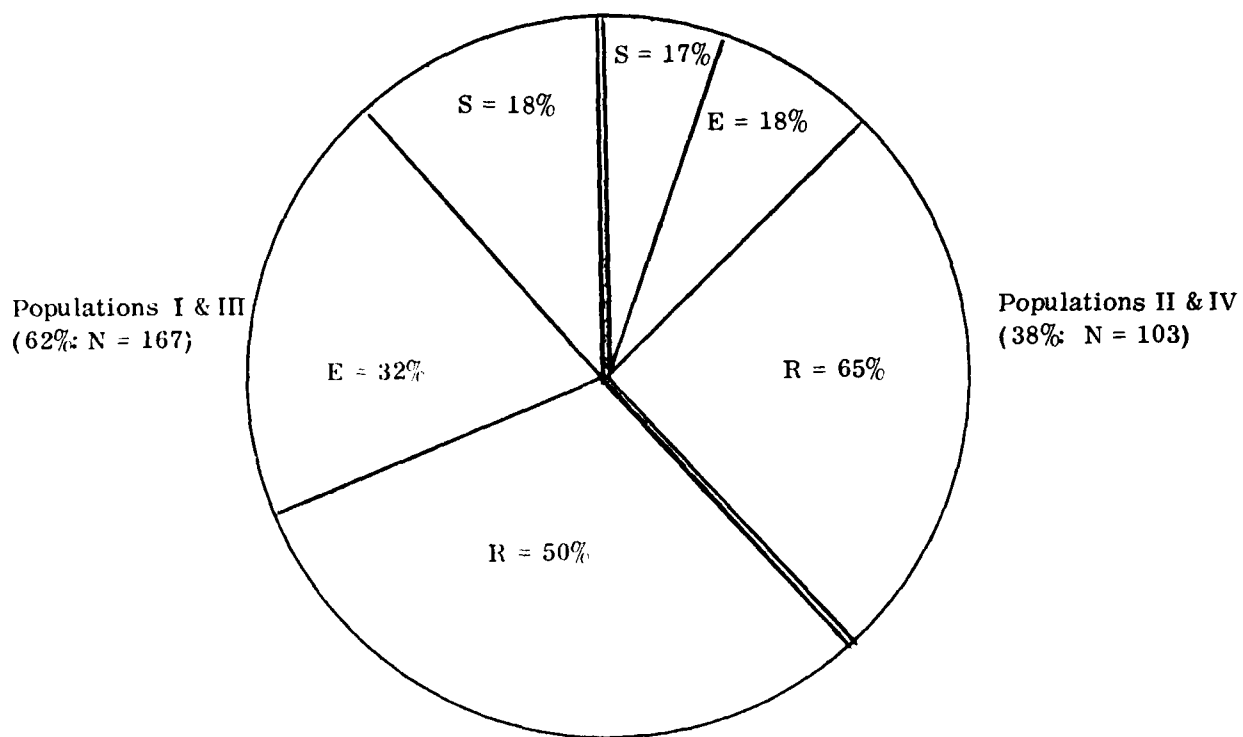
In absence of prior data about actual crew performance, the sampling was stratified based upon crew type, R = Ready, E = Lead, and S = Select. As implied by these labels, S crews should be more proficient (and less numerous) than E crews, and they in turn should be more proficient (and less numerous) than R crews. The crew type ratings were therefore assumed to represent relatively homogeneous proficiency levels in crew performance. Figure 2 summarizes the percentage of R, E, and S crews in each of the four "sub"-populations of the overall crew force for B-52 G/H aircraft. Figure 3 presents these same data summarized by model (G vs. H).

* Similarly, the predictive validity of the experimental data and conclusions derived from analyses of these results can also be degraded by time varying population changes.



Population I: Bases with G Model Aircraft without AOU
 Population II: Bases with H Model Aircraft with AOU
 Population III: Bases with G Model Aircraft with AOU
 Population IV: Bases with H Model Aircraft without AOU

Figure 2. Distribution of Navigator/Radar Navigator Teams by Team Type
 (R = Ready, E = Lead, S = Select)



DISTRIBUTION OF CREWS BY TYPE (N = 270)

Population	R Teams	E Teams	S Teams
I	62	30	21
II	45	8	11
III	21	24	9
IV	22	11	6

Figure 3. Proportionate Division of Crew Types within Bases with G versus H Model Aircraft.

The crew type (R, E, and S) thus provided a reasonable method for stratifying the sample. The sub population (G bases without AOU) distribution of variables (flying hours, age, rank, etc.) appeared equivalent to the entire crew force (see Supplements I and II). An analysis of variance (see Appendix F) verified each of these strata had significantly different amounts of flying hours.

This analysis of variance (ANOVA) was performed to determine whether the sub population (non-AOU equipped G bases) had an average number of flying hours that was atypical of the other sub populations. It was discovered that the G model bases that *were* equipped with AOU had a significantly *larger* average (flying hours) than any of the other sub populations. The difference between G and H bases not equipped with AOU was not statistically significant. It should be noted that statistical tests are geared to test for differences, and failure to detect significant differences does not necessarily imply equivalence.

Based on this analysis, the sample was selected on a proportionate sampling basis. With a sample size of six crews, the proportionate breakdown by crew type resulted in 3-R crews, 2-E crews, and 1-S crew.

Sampling Index

A review of the correlation matrix for the crew force showed that variable 64, the average number of total flight experience per crew, correlated with the greatest number of variables (see Table 4). The variables in Table 4 are rank ordered from highest r value to the lowest according to their correlation with variable 64. Because of the large sample size ($N = 269$), any correlation value greater than 0.1946 is statistically significant at the .05 level. The original matrix is in Supplement I. If two variables are correlated highly enough, one might be eliminated as a candidate predictor of crew proficiency. Since the coefficient of determination is based on squaring the correlation coefficient, a value of $r = .30$ was used as a cut-off for screening candidate predictors. It is interesting to note that 10 variables with an $r > 0.30$ are from the radar navigators' data, 7 with an $r > 0.30$ are team data, and only 6 variables with an $r > 0.30$ are from navigators' data. The frequency distribution (see Supplement I) of variable 64 was positively skewed with a mean value of 724.7431 hours and a standard deviation of 358.8322. Additional descriptive statistics are in Appendix E of this paper.

The variables in Table 4 were then checked in the population to verify their correlational strength (see Table 5 and Supplement II). Because these relationships remained relatively constant, it was then decided that variable 64 was a good variable to use as the sampling index.

When variable 64 was calculated within each strata (see Table 4), it appeared to be a realistic predictor of crew proficiency. Its distribution also supported the use of the proportionate sampling approach. The analysis of variance (Appendix F) indicated that S crew flying hours were significantly larger (on the average) than E crew flying hours and that E crew hours were significantly greater than R crew flying hours. This refutes the assertion that there is one single population which well describes the flying hours of the overall crew force and supports the premise that a stratified sampling strategy should be employed.

TABLE 4

CORRELATION MATRIX OF VARIABLES WHICH CORRELATED WITH THE CRITERION
VARIABLE (VARIABLE 64-AVERAGE FLYING HOURS PER TEAM) FROM THE ENTIRE SAC
NAVIGATOR/RADAR NAVIGATOR POPULATION

Variables	63	50	48	47	24	2	38	37	46	45	58	32
63	1.0000	.5290	.7711	.9277	.5929	.2578	.4178	.4019	.4634	.4586	.3750	.2823
50		1.0000	.3788	.4789	.9523	.8107	.1781	.1923	.2868	.2977	.1324	.1034
48			1.0000	.8107	.4891	.0609	.4358	.4198	.1739	.1746	.4129	.4251
47				1.0000	.6151	.0831	.4911	.4699	.1478	.1535	.3153	.3116
24					1.0000	.5934	.2524	.2648	.1475	.1532	.1545	.1571
2						1.0000	-.0145	-.0007	.4736	.4912	.0530	-.0288
38							1.0000	.9218	-.0479	-.0247	.3444	.3740
37								1.0000	-.0412	-.0181	.3189	.3481
46									1.0000	.9823	.2760	.0274
45										1.0000	.2667	.0299
58											1.0000	.8926
32												1.0000
54												
28												
35												
20												
42												
49												
61												
23												
59												
11												
8												

Variables	54	28	35	20	42	49	61	23	59	11	8
63	.4327	.3600	.2145	.3196	.3144	.1876	.1746	.1729	-.4023	.3784	.4577
50	.2952	.2005	.8652	.0848	.0722	.0637	-.8420	.0568	-.2576	-.2542	-.2631
48	.3837	.4464	.1821	.1857	.1879	.6993	.1213	.7018	-.2333	-.1277	-.2926
47	.3789	.4297	.2081	.2269	.2279	.1536	.1502	.1519	-.2319	.1448	-.2913
24	.2897	.2614	.8015	.0665	.0556	.0800	.7682	.0772	-.1882	-.1462	-.2167
2	.2230	.0274	.7445	.0959	.0959	.0146	.7833	.0017	-.3184	-.3899	-.2781
38	.3847	.5142	.2260	.1793	.1690	.1218	.1320	.1382	.1139	.0251	-.1608
37	.3722	.4937	.2419	.1872	.1770	.1209	.1425	.1369	.1144	.0164	-.1691
46	.2385	.0287	.0825	.3367	.3212	.1680	.2367	.1138	-.5269	-.6683	-.5362
45	.2731	.0364	.0888	.3236	.3074	.1130	.1164	.1080	-.5310	.0081	-.5411
58	.0828	.2738	.1548	.2034	.2033	.3266	.0628	.3135	.1578	-.1800	-.2921
32	.1978	.2894	.0782	.0985	.1041	.3335	.0511	.3384	.0548	.0218	-.1544
54	1.0000	.7628	.2285	.1947	.1800	.2048	.1947	.1868	-.0828	-.1694	-.2498
28		1.0000	.2007	.1038	.1102	.2301	.1517	.2307	.1112	.0443	-.0715
35			1.0000	.1046	.0285	.0539	.9697	.0542	.0322	-.1103	-.1182
20				1.0000	.9831	.0594	.0334	.0879	.2232	-.2655	.6524
42					1.0000	.0615	.0478	.0399	.2232	-.2508	-.6524
49						1.0000	.0274	.9937	.1324	-.0579	.1601
61							1.0000	.0221	.0822	.1074	.1065
23								1.0000	.1116	.0395	.1397
59									1.0000	.7645	.5502
11										1.0000	.5393
8											1.0000

TABLE 5

CORRELATION MATRIX OF VARIABLES WHICH CORRELATED WITH THE CRITERION
VARIABLE (VARIABLE 64-AVERAGE FLYING HOURS PER TEAM) FROM BASES WITH G MODEL
AIRCRAFT WITHOUT AOU

Variables	63	50	48	47	24	2	38	37	46	45	58	32
63	1.0000	.9668	.9091	.9232	.8794	.5150	.4846	.4846	.4995	.5035	.3754	.3767
50		1.0000	.8685	.9001	.9241	.4998	.4746	.4746	.4599	.4699	.3754	.4596
48			1.0000	.9840	.9243	.1579	.5805	.5805	.1350	.1324	.3414	.4006
47				1.0000	.9608	.1579	.5579	.5579	.1329	.1312	.3211	.3796
24					1.0000	.1308	.5405	.5405	.0994	.9608	.2780	.3290
2						1.0000	.0062	.0062	.9678	.9742	.3439	.1275
38							1.0000	1.0000	.0037	.0044	.4031	.4596
37								1.0000	.0037	.0044	.4031	.4596
46									1.0000	.9934	.3579	.1200
45										1.0000	.3616	.1181
58											1.0000	.8693
32												1.0000
54												
28												
35												
20												
42												
49												
61												
23												
11												
8												
Variables	54	28	35	20	42	49	61	23	59	11	8	
63	.3539	.3592	.3780	.3567	.3567	.2072	.3585	.1880	.3603	.3835	.4401	
50	.3096	.3332	.4200	.3115	.3115	.0972	.4046	.0851	.3380	.3590	.4138	
48	.3002	.4301	.4678	.2560	.2560	.3562	.3772	.3713	.1382	.1075	.2454	
47	.2718	.4148	.4736	.2399	.2399	.1903	.3883	.1998	.1555	.1143	.2474	
24	.1425	.3890	.5070	.1926	.1926	.0603	.4230	.0765	.1335	.1016	.2263	
2	.3000	.0171	.0596	.3714	.3714	.1155	.0909	-.0475	-.5740	-.7011	.5603	
38	.3112	.4605	.8411	.1719	.1719	.2160	.7332	.2850	.0949	.0380	.1180	
37	.3112	.4605	.8411	.1719	.1719	.2160	.7332	.2850	.0949	.0380	.1180	
46	.0113	.0105	.0818	.3908	.3908	.1559	.0473	.0587	-.5849	-.7353	.5839	
45	.3018	.0063	.0666	.3807	.3807	.1066	.0518	.1998	-.5797	-.7324	.5788	
58	.3145	.2406	.3378	.3579	.3579	.2100	.3090	.2040	-.1940	-.3104	.3189	
32	.2908	.1102	.3892	.2552	.2552	.2198	.3058	.2248	.1720	.1177	.1784	
54	1.0000	.7265	.1498	.2653	.2653	.3120	.1829	.2343	-.0511	-.1939	-.1953	
28		1.0000	.3704	.2151	.2151	.0560	.7337	.2036	.1667	.0979	.0046	
35			1.0000	.0305	.0305	.2222	.3377	.1046	.1886	.0380	-.0576	
20				1.0000	1.0000	.1996	.0794	.1575	-.2666	.3245	.6107	
42					1.0000	.1996	.0794	.1575	-.2666	.3245	.6107	
49						1.0000	.0411	.9665	.0167	-.0675	-.1174	
61							1.0000	.0509	.0382	.0280	.0976	
23								1.0000	.0503	.0041	.0602	
59									1.0000	.7235	.6545	
11										1.0000	.6282	
8											1.0000	

Sampling Strategy

A systematic sampling procedure was used in lieu of simple random sampling. The following criteria were used for crew selection:

1. Since only one S team was to be chosen, it should be the most representative of the Select crews. Therefore, the navigator's total number of flying hours (Var 46), the radar navigator's total number of flying hours (Var 48), and the crew's average number of flying hours (Var 64) should fall with ± 1 standard deviation of their respective mean in the overall crew force.
2. One E crew and one R crew should be selected on the same basis, where their flight experience (Var 46, 48 and 64) should be representative of their stratum. This would facilitate crew performance comparisons across strata.
3. One E and one R crew was selected so as to emphasize the differences in flying hours between the navigator and radar navigator but maintaining a representative average number of crew flying hours. This selection strategy paired a relatively less-experienced navigator with a relatively more-experienced radar navigator while maintaining the average team hours at a representative level. As was previously mentioned, two E crews and three R crews were to be selected.
4. The final R crew had a highly experienced navigator with a relatively inexperienced radar navigator. This crew would be the rarest case since navigators typically upgrade to the radar navigator position. The reversal of experience represented in this case is therefore not typical but represents an extreme condition. The team chosen was again picked such that the average team flying hours were as close to the average R team hours as possible to assure "representativeness" in this sense.

Normally, random sampling would be used within the strata. Since the sample size was already quite small and the purpose of the preliminary study was basically exploratory, this systematic sampling procedure allowed the examination of the technique itself without severely impacting the baseline study to be conducted later.

The logistics of this procedure were subsequently found to make it impractical to implement with the rate of crew turnover experienced between the survey and the study. A random selection procedure would not only be more scientific, it would also be more practical in this case.

TABLE 6
DISTRIBUTION OF TEAM FLYING HOURS AMONG STRATA

Group	N	$\bar{X}$	S.D.
SAC (All Crews)	269	724.7431	358.8322
SAC (G Bases)	167	731.5852	359.4050
G Bases With AOU	54	801.4785	479.9370
R Crews	21	611.5703	259.6460
E Crews	24	820.2625	525.2678
S Crews	9	1194.5266	499.3796
G Bases Without AOU	113	698.1914	278.1433
R Crews	62	620.7317	210.6208
E Crews	30	647.7734	228.3969
S Crews	21	998.9363	314.6035
SAC (H Bases)	102	713.6786	357.5861
H Bases With AOU	64	710.9185	360.2913
R Crews	45	620.4223	218.6224
E Crews	8	648.0559	178.9041
S Crews	11	1126.8528	571.8977
H Bases Without AOU	38	718.2236	353.0313
R Crews	22	634.8782	263.8948
E Crews	10	701.1355	366.5623
S Crews	6	1055.1663	410.9234

TABLE 7
SAMPLE DIFFERENCES VERSUS POPULATION VALUES (OCTOBER, 1976)

NAMES (TEAM)	VAR 46		VAR 48		VAR 64	
	$\bar{X}$	s.d.	$\bar{X}$	s.d.	$\bar{X}$	s.d.
Population - S Teams	717.1140	171.9165	1280.7617	599.6726	998.9380	307.2717
S1:	158.8860		- 63.7617		47.5620	
S1a:	144.8860		19.2383		82.0620	
Population - E Teams	443.8398	188.3563	851.7097	399.1624	647.7748	228.3969
E1:	- 93.8396		98.2903		2.2250	
E1a:	- 16.8396		- 48.7097		- 32.4724	
E2:	- 273.8396		- 241.7079		- 257.7748	
E2a:	- 283.8396		148.2930		- 67.7748	
Population - R Teams	461.3643	196.0726	780.1074	421.7866	620.5000	210.6208
R1:	188.6357		- 160.1074		14.5000	
*R1a:	11.3600		- 5.1100		7.5000	
R2:	61.3643		1019.8926		500.0000	
R2a:	96.3643		649.8926		277.0000	
R3:	388.6357		- 630.1074		- 120.5000	
*R3a:	349.6357		- 188.5000		1.0000	

* These teams were replacements because the preferred teams were unavailable.

RESULTS AND DISCUSSION

Two samples were chosen, six primary and six alternate crews (see Table 7). They were selected on a nonrandom basis as just described. Because of crew turnover, it also became desirable to attempt to have approximately equal numbers of crews from each of the available bases. Some of the crews were replaced several times by SAC until January, 1977 when the sample shown in Table 8 was committed to the study.

At the outset, there was some concern about the personnel having mini-team experience* since this might be "nonrepresentative" of conventionally trained crews, where the radar navigator has first served as navigator before upgrading. It turned out that mini-teams were not evenly distributed in the four groups. They were a small proportion of the overall crew force, and they dominated the select crew breakout. Therefore, the mini-team issue does not appear critical in the sampling effort. Given the current maturity of these crews, one would expect that any performance differences should have been attenuated by the years of intervening training and experience. In effect, the impact of being a select crew and the impact of having been on a mini-team should be indistinguishable in the study results.

The command has significant shifts in the level of experience compared to levels typical a decade ago. This fact is reflected in the statistical summaries of rank and age (Variables 6, 28 and 54, and Variables 6, 29, and 55 respectively). See Appendix E for the mean, standard deviation, and range of these and other selected variables. The reader is cautioned that many of the variables evidence marked skewness so that calculations of percentiles for these distributions using normal theory assumptions would be tenuous. Appendix E shows evidence of this by providing data on the minimum and maximum values for each of these variables along with the computed index of skewness. A normally distributed set of values has no skewness, so larger values of skewness potentially reflect appreciable deviations from what would be expected if the values had been generated by a Gaussian process.

Flying hours (Variables 1-3, 23-25, and 45-51 in particular) are especially suspect. The source of the non-normality lies with the few remaining members of the crew force who have accumulated a large amount of flying time. They constitute "outliers" in the crew force population. This tends to bias the average upwards as well as inducing skewness. No attempt was made to drop these crewmembers from the data pool, but as they move off the active crew list, one should expect the averages of these crew data to decrease. The distributions may also then lose some (but probably not all) of their skewness.

Table 6 shows the correlations among the variables. These data must be cautiously interpreted since the analyses are predicated on normal theory assumptions which have already been questioned. The intent of this analysis was to see which information might be deleted in future surveys. If one variable correlates highly with another, then it is a good predictor of the other, and one might choose to ask for one but not both. It is important, however, to consider the squared correlation value as a rough index of predictability (coefficient of determination). None of the correlations is large and their squared values will be even smaller (e.g., if $r = .7$, then $r^2 = .49$). These correlations do not, by themselves, seem to support the notion that some question(s) should be deleted from the survey.

They do suggest, though, that rank and age are correlated well enough that rank may not be a required item. Age provides a finer graduation of values and might prove to be the better of the two as a predictor variable. Unit proficiency and instructor status did not correlate as well as we naively expected, although the reasons for this may be apparent to HQ-SAC.

Once the performance data are available, regression analyses can be performed to search for a combination of survey questions that best serve the purpose of selecting a representative sample of crews based on their performance capability.

* In mini-teams, the radar navigator had no prior navigator experience; they trained as a crew from the outset.

TABLE 8
SAMPLE DIFFERENCES VERSUS POPULATION (JANUARY, 1977)

NAMES (TEAM)	VAR 46		VAR 48		VAR 64	
	$\bar{X}$	s.d.	$\bar{X}$	s.d.	$\bar{X}$	s.d.
Population - S Teams	717.1140	171.9165	1280.7617	599.6726	998.9380	307.2717
*S1:	-200.2140		-477.7617		-338.9880	
S1a:	144.8860		146.2383		145.5620	
Population - E Teams	443.8398	188.3563	851.7097	399.1624	647.7748	228.3969
E1:	93.8396		98.2903		2.2252	
*E1a:	-16.2398		-51.7097		-33.9748	
E2:	-273.8398		-241.7097		-257.7748	
E2a:	-283.8398		148.2903		-67.7748	
Population - R Teams	461.3643	196.0726	780.1074	421.7866	620.5000	210.6208
R1:	31.6357		-100.1074		-30.5000	
*R1a:	134.9643		-487.8074		-311.1500	
R2:	68.6357		389.8926		229.5000	
R2a:	NO DATA		299.8926		NO DATA	
R3:	98.6357		630.1074		-265.5000	
*R3a:	11.3643		-5.1074		-8.0000	

* These teams violate sampling criteria and were replacements by SAC.

RECOMMENDATIONS

1. The questionnaire should include a category indicating the number of hours and assignments in which that crew has been together.
2. The survey should be conducted as close to the commencement of the data collection phase of the experiment as possible. This would reduce the number of iterations in the selection process that occurred during this effort.
3. Because of the high turnover rate, it is recommended that crews be asked if they know the date of their next assignment. If they do, and that date conflicts with their being scheduled to participate, there is little purpose in selecting them as part of the sample. It may also be useful to ask crews to report the departure date, base, and duties of their previous assignment.
4. It was learned that the exclusion of height and weight information in the survey was a serious oversight. Since the studies to be conducted are intended to provide a basis for evaluation the human engineering design of the crewstation, the sample must "represent" not only "experience" but "size variations" in the crew force. While these considerations would not be the basis for selecting the sample, they should be employed in screening the selection to preclude bias toward either extreme (all tall or all short subjects).

APPENDIX A

DATA LISTING

BASES WITH H MODEL AIRCRAFT WITHOUT AOU E TEAMS

1	.0	.0	339.0	200.0	139.0	02290305022001110170009	6
1	428.0	.0	956.0	711.0	556.0	03300305081103330180009	6
1	25.0	.0	570.0	570.0	570.0	02280314021202220200010	6
1	25.0	.0	613.0	613.0	613.0	03270314021101110190010	6
1	.0	.0	480.0	480.0	360.0	02270311012001110230012	6
1	105.0	.0	650.0	500.0	300.0	03300302053103330240012	6
1	.0	.0	291.0	291.0	190.0	02250308012001110290015	6
1	120.0	.0	490.0	490.0	490.0	02270308031202220300015	6
1	.0	.0	366.0	366.0	290.0	02260312012001110310016	6
1	80.0	.0	655.0	655.0	655.0	03270312031202220320016	6
1	.0	.0	452.0	452.0	452.0	02270310021001110330017	6
1	100.0	.0	738.0	738.0	850.0	03280310032103330340017	6
1	.0	.0	425.0	425.0	380.0	02250320012001110350018	6
1	.0	.0	430.0	430.0	250.0	02280312012002220360018	6
1	.0	.0	347.0	347.0	22.0	0228030901300111030021	12
1	.0	.0	930.0	250.0	30.0	03280209032003330 40021	12
1	.0	.0	400.0	300.0	30.0	03290308012001110290015	12
1	1500.0	1100.0	600.0	300.0	20.0	03350207021112220300015	12
1	.0	.0	300.0	300.0	120.0	02250307013001110310017	12
1	.0	.0	610.0	340.0	.0	02280318181002230320017	12

R TEAMS

1	.0	.0	201.0	201.0	201.0	02280302013001110 70104	6
1	.0	.0	853.0	853.0	853.0	03280306053003330 80104	6
1	.0	.0	228.0	228.0	228.0	03290303023001110 90105	6
1	150.0	.0	1100.0	900.0	600.0	03280304043103330100105	6
1	110.0	.0	550.0	550.0	550.0	02270302031101110110106	6
1	200.0	.0	1200.0	600.0	300.0	03280302042103330120106	6
1	.0	.0	227.0	227.0	227.0	02260303013001110130107	6
1	100.0	.0	791.0	791.0	791.0	03270303053103330140107	6
1	.0	.0	569.0	569.0	470.0	02270311041001110150108	6
1	.0	.0	450.0	450.0	450.0	02280311021002220160108	6
1	.0	.0	608.0	608.0	608.0	02270207081001110210111	6
1	100.0	.0	810.0	810.0	700.0	03270307023103330220111	6
1	.0	.0	304.0	304.0	200.0	02260306012001110270114	6
1	.0	.0	451.0	451.0	295.0	02260306022002220280114	6
1	.0	.0	700.0	700.0	200.0	02270310021001110370119	6
1	.0	.0	355.0	355.0	205.0	02250310012002220380119	6
1	.0	.0	310.0	310.0	212.0	02240305013001110390120	6
1	.0	.0	463.0	463.0	463.0	02260305031002220400120	6
1	.0	.0	299.0	299.0	194.0	02240307012001110410121	6
1	.0	.0	398.0	398.0	398.0	01260307021002220420121	6
1	.0	.0	460.9	460.9	7.2	02270305032001110 10105	12
1	.0	.0	400.0	500.0	17.0	03300305063003330 20105	12
1	.0	.0	510.0	510.0	25.0	02270312013001110 50104	12
1	.0	.0	453.0	453.0	16.0	02310307013002220 60104	12
1	.0	186.3	506.5	692.5	27.0	02270305023021220 90120	12
1	.0	.0	400.0	400.0	30.0	02250312122002220100120	12
1	.0	.0	200.0	200.0	140.0	01240302013001110110119	12
1	.0	.0	481.0	400.0	8.0	03280302042002220120119	12
1	.0	.0	600.0	250.0	10.0	02270314012001110139112	12
1	240.0	.0	1100.0	400.0	120.0	03300305033103330140112	12
1	.0	.0	420.0	420.0	14.0	02270312022001110150118	12
1	.0	.0	2550.0	480.0	14.0	02270312042002220160118	12
1	.0	.0	436.0	436.0	10.0	02270304022001110170111	12

**BASES WITH H MODEL AIRCRAFT WITHOUT AOU
R TEAMS (Cont'd)**

1	95.0	.0	808.0	420.0	192.0	03270304043103330180111	12
1	.0	.0	400.0	.0	420.0	02250308072001010190113	12
1	200.0	.0	700.0	400.0	8.0	03300208093303330200113	12
1	.0	.0	521.0	500.0	.0	02250310032001100210114	12
1	.0	.0	350.0	350.0	.0	02290310032002200220114	12
1	.0	.0	250.0	250.0	125.0	02280302033001110230107	12
1	250.0	.0	1100.0	250.0	80.0	03300302083103330240107	12
1	110.0	.0	600.0	600.0	24.0	02270230011101110271116	12
1	110.0	.0	600.0	600.0	24.0	02270330011202220281116	12
1	.0	.0	253.0	253.0	140.0	02270305013001110330110	12
1	300.0	.0	880.0	500.0	16.0	03300205073103330340110	12

S TEAMS

1	.0	.0	850.0	750.0	750.0	032701140610011110 10201	6
1	1000.0	.0	2000.0	950.0	950.0	04340114071303330 20201	6
1	.0	.0	548.0	548.0	548.0	023101090210011110 30202	6
1	385.0	.0	1200.0	900.0	600.0	03300105051103330 40202	6
1	.0	.0	589.0	589.0	589.0	022601020610011110 50203	6
1	100.0	.0	900.0	900.0	750.0	03270102093103330 60203	6
1	.0	.0	360.0	240.0	240.0	02270216011001110250213	6
1	100.0	.0	850.0	800.0	750.0	0327021602102220260213	6
1	.0	.0	750.0	400.0	100.0	032601070410011110 70203	12
1	.0	.0	1230.0	450.0	80.0	03300107052003330 80203	12
1	.0	.0	500.0	350.0	30.0	02260106041001110250202	12
1	.0	.0	1300.0	400.0	30.0	03280106051003330260202	12

**BASES WITH H MODEL AIRCRAFT WITH AOU
E TEAMS**

0	110.0	.0	720.0	650.0	640.0	02290228011202221280021	8
0	120.0	.0	720.0	650.0	640.0	02290220041101111270021	8
0	.0	.0	500.0	500.0	400.0	02260316011001111311027	8
0	.0	.0	500.0	500.0	460.0	03290316011002221321027	8
0	.0	.0	875.0	775.0	200.0	03280304033003330401	14
0	.0	.0	200.0	200.0	200.0	01280307013001110391	14
0	.0	.0	500.0	400.0	200.0	022603020230011110 10008	14
0	150.0	.0	1400.0	500.0	200.0	03290302043103330 20008	14
0	.0	.0	500.0	350.0	75.0	022903070330011110 50005	14
0	85.0	.0	800.0	500.0	300.0	03280205022103330 60005	14
0	.0	.0	282.0	282.0	282.0	022803090230011110 70006	14
0	.0	.0	819.3	750.0	360.0	03290309023003330 80006	14
0	.0	.0	500.0	400.0	300.0	02260309021001110290038	14
0	.0	.0	600.0	400.0	300.0	03300309031002220300038	14
0	.0	.0	600.0	520.0	100.0	02270208051001110330042	14
0	.0	.0	387.6	387.6	75.0	02260308022002220340042	14

R TEAMS

0	.0	.0	550.0	550.0	400.0	022503130120011111 70105	8
0	60.0	.0	900.0	900.0	600.0	03260306043103331 80105	8
0	.0	.0	500.0	500.0	500.0	022602060220011111 90106	8
0	100.0	80.0	1000.0	950.0	150.0	03280307182113331100106	8
0	.0	.0	800.0	800.0	700.0	02290304032001111110107	8
0	100.0	.0	700.0	200.0	100.0	03280306043103331120107	8
0	.0	.0	800.0	700.0	600.0	02260212041011111130110	8
0	100.0	.0	900.0	650.0	500.0	02270212021202221140110	8
0	.0	.0	240.0	240.0	150.0	02260306011001111150112	8
0	80.0	.0	650.0	650.0	650.0	02290214011202221160112	8
0	.0	.0	865.0	795.0	795.0	02260302031001111170115	8
0	100.0	.0	600.0	550.0	250.0	02260302032203331180115	8
0	.0	.0	750.0	700.0	700.0	02290302051001111190116	8

**BASES WITH H MODEL AIRCRAFT WITH AOU
R TEAMS (Cont'd)**

0	1000.0	.0	1000.0	1000.0	800.0	03270301003101111200116	8
0	.0	.0	412.0	412.0	275.0	02310301031001111210117	8
0	.0	.0	1360.0	1360.0	900.0	03270202031003331220117	8
0	.0	.0	276.0	276.0	276.0	02250308073001111230118	8
0	.0	.0	1066.0	1066.0	950.0	03290308053003331240118	8
0	80.0	80.0	440.0	300.0	200.0	03270209021111111250119	8
0	100.0	.0	450.0	450.0	450.0	03300309022202221260119	8
0	50.0	.0	500.0	500.0	500.0	02290301021101111290123	8
0	100.0	.0	750.0	500.0	250.0	03320201062103331300123	8
0	.0	.0	350.0	350.0	250.0	02260318012001111331128	8
0	.0	.0	400.0	400.0	300.0	02260318013002221341128	8
0	.0	.0	360.0	360.0	360.0	02270302032001111350129	8
0	.0	.0	1200.0	1200.0	700.0	03310312043003331360129	8
0	.0	.0	450.0	450.0	320.0	02260313012001111371130	8
0	.0	.0	450.0	450.0	320.0	02270313013002221381130	8
0	.0	.0	550.0	550.0	400.0	02260304021001111390131	8
0	70.0	.0	1100.0	1000.0	600.0	03280304053103331400131	8
0	.0	.0	360.0	360.0	360.0	02250302023001111410132	8
0	200.0	.0	1000.0	600.0	150.0	03290302052103331420132	8
0	.0	.0	297.7	297.7	297.7	02280301022001111 90105	9
0	.0	.0	411.6	411.6	411.6	02300301023003331100105	9
0	.0	.0	156.0	156.0	156.0	0127030101300111110106	9
0	67.0	.0	1010.0	584.0	214.0	03260204073103331120106	9
0	.0	.0	359.4	359.4	359.4	0226031801200111130107	9
0	.0	.0	979.9	720.1	571.9	03280318013003331140107	9
0	.0	.0	392.6	392.6	392.6	02300209012001111150108	9
0	.0	.0	755.2	755.2	505.2	02260309033003331160108	9
0	.0	433.6	433.6	433.6	433.6	02290207012011111170109	9
0	.0	.0	974.3	711.4	648.0	03290307033003331180109	9
0	.0	.0	492.4	492.4	492.4	02250310022001111190110	9
0	.0	.0	946.1	741.9	482.8	03260310013003331200110	9
0	.0	.0	237.9	237.9	237.9	01260301023001111210111	9
0	.0	109.2	137.1	137.1	137.1	04360301103033331220111	9
0	.0	.0	236.5	236.5	236.5	02250306013001111230112	9
0	.0	.0	763.7	763.7	429.2	03290306013003331240112	9
0	.0	.0	215.9	215.9	215.9	02260308033001111250114	9
0	.0	.0	715.0	715.0	321.5	03270208013003331260114	9
0	.0	.0	282.3	282.3	282.3	02300309013001111270115	9
0	85.3	.0	651.2	619.7	415.9	03260309013103331280115	9
0	.0	.0	322.7	322.7	322.7	02270303023001111290116	9
0	.0	.0	360.0	519.2	452.6	02260303032002221300116	9
0	.0	.0	395.1	395.1	395.1	02250210013001111310117	9
0	.0	.0	538.7	538.7	481.5	02280310023002221320117	9
0	.0	.0	282.7	282.7	282.7	02260304013001111330118	9
0	.0	.0	418.5	418.5	418.5	02270304052002221340118	9
0	.0	.0	484.6	484.6	484.6	02260308013003331360119	9
0	.0	.0	509.8	509.8	509.8	02260308013003331360119	9
0	.0	.0	205.3	205.3	205.3	02270304013001111370120	9
0	.0	.0	664.8	664.8	432.7	03290304013003331380120	9
0	.0	.0	507.5	507.5	498.8	03300310013003331390121	9
0	88.2	.0	812.7	708.7	547.5	03280210031203331400121	9
0	.0	.0	251.6	251.6	251.6	02290310013001111410122	9
0	.0	.0	756.2	696.1	496.4	03280310013003331420122	9
0	.0	.0	559.2	559.2	451.8	02260218012001111431123	9
0	.0	.0	509.0	509.0	401.6	02310318013002221441123	9
0	.0	.0	279.9	279.9	279.9	02290302023001111450124	9
0	88.0	.0	788.3	657.5	435.5	03260202042103331460124	9
0	.0	.0	400.0	400.0	150.0	02300301032001110110109	14
0	300.0	.0	900.0	700.0	250.0	03290301083103330120109	14
0	.0	.0	330.0	330.0	100.0	02250310012001110150111	14
0	.0	.0	400.0	350.0	100.0	02280308032002220160111	14

**BASES WITH H MODEL AIRCRAFT WITH AOU
R TEAMS (Cont'd)**

0	0	0	800.0	600.0	200.0	03270203081001110170112	14
0	400.0	0	850.0	350.0	200.0	03320303083103330180112	14
0	0	0	950.0	600.0	130.0	03290201031001110210122	14
0	0	0	280.0	280.0	130.0	02250301033002220220122	14
0	0	0	260.0	260.0	240.0	02250310013001110231128	14
0	0	0	260.0	260.0	240.0	02250310013002220241128	14
0	0	0	350.0	350.0	100.0	02270305013001110250130	14
0	80.0	0	850.0	850.0	100.0	02270306021202220260130	14
0	0	0	388.0	388.0	200.0	02290308013001110270134	14
0	100.0	0	200.0	600.0	300.0	03270308043102220280134	14
0	0	0	500.0	500.0	300.0	02260301042001110310141	14
0	100.0	0	1100.0	500.0	500.0	03280201022103 30320141	14
0	0	0	170.0	170.0	170.0	02240301013001110350144	14
0	0	0	900.0	700.0	300.0	03300301043002220360144	14
0	0	0	175.0	175.0	175.0	02250304013001110370148	14
0	100.0	0	900.0	500.0	250.0	03270304043103330380148	14

S TEAMS

0	0	0	320.0	320.0	320.0	03260103033001111 10201	8
0	0	0	1450.0	750.0	310.0	03290103041003331 20201	8
0	100.0	0	700.0	600.0	600.0	02270107041101111 31202	8
0	0	0	700.0	700.0	650.0	02280107021003331 41202	8
0	0	0	700.0	550.0	490.0	02250102032001111 50203	8
0	0	0	1200.0	800.0	400.0	03300101063003331 60203	8
0	0	0	510.0	510.0	443.9	02260109021001111 10201	9
0	1071.1	1846.7	697.3	697.3	600.1	03320109041333331 20201	9
0	0	0	687.2	687.2	465.4	02260103041001111 30202	9
0	786.9	1521.4	640.4	903.0	574.4	03360103051333331 40202	9
0	0	0	465.0	465.0	442.0	02250118011001111 50203	9
0	77.0	0	958.3	756.9	595.0	03310118012103331 60203	9
0	0	0	571.4	571.4	503.1	02310109012003331 70204	9
0	0	0	1128.1	880.8	566.6	03280109022003331 80204	9
0	200.0	0	1300.0	400.0	300.0	03290104071101110 30202	14
0	1000.0	1500.0	300.0	300.0	300.0	03340104101322330 40202	14
0	60.0	0	700.0	650.0	250.0	03280102041101110 90208	14
0	100.0	0	1000.0	700.0	150.0	03280102031202220100208	14
0	0	0	160.0	160.0	160.0	02250301013001110130210	14
0	0	0	450.0	450.0	75.0	02260301042002220140210	14
0	0	0	440.0	440.0	250.0	02270106022001110190220	14
0	350.0	0	1100.0	600.0	300.0	03270108041103330200220	14

**POPULATION WITH MODEL G AIRCRAFT WITHOUT AOU
E TEAMS**

0	0	335.0	0	335.0	235.0	02250208012010110151009	2
0	0	500.0	0	500.0	400.0	02270308022020220161009	2
0	0	262.0	0	262.0	262.0	02260304013010110171010	2
0	0	317.0	0	317.0	180.0	02260304023020220181010	2
0	0	550.0	0	550.0	540.0	02260303032010110190012	2
0	394.0	909.0	0	909.0	655.0	03300303043230330200012	2
0	0	213.0	0	213.0	213.0	02260302013010110211013	2
0	0	700.0	0	700.0	600.0	02270302041020220221013	2
0	0	415.0	0	415.0	360.0	02260308022010110231014	2
0	0	268.0	0	268.0	200.0	02250308023020220241014	2
0	50.0	765.0	0	765.0	765.0	03280236011110110271016	2
0	50.0	900.0	0	900.0	900.0	02260236011220220281016	2
0	0	527.0	0	527.0	407.0	02250305032610110290017	2
0	50.0	800.0	0	800.0	465.0	03290305063120220300017	2
0	0	272.0	0	272.0	152.0	02250305013010110310018	2
0	90.0	1200.0	0	1200.0	600.0	03280301053130330320018	2
0	0	495.0	0	495.0	380.0	02260306023030330330022	2
0	0	502.0	0	502.0	342.0	03300207022030330340022	2
0	0	750.0	0	750.0	700.0	02260201051010110351024	2
0	80.0	250.0	200.0	450.0	250.0	02270301033222220361024	2
1	0	430.0	0	302.0	300.0	02280305022030331 90005	4

**POPULATION WITH MODEL G AIRCRAFT WITHOUT AOU
E TEAMS (Cont'd)**

1	.0	1500.0	.0	400.0	200.0	03300205032030331100005	4
1	.0	400.0	.0	400.0	400.0	02280308022010111130008	4
1	.0	560.0	.0	560.0	560.0	02260308022020221140008	4
1	.0	400.0	.0	200.0	200.0	03290306052010111150009	4
1	.0	900.0	.0	650.0	400.0	03310306053030331160009	4
1	.0	275.0	.0	275.0	275.0	02260303022010111170010	4
1	80.0	650.0	.0	500.0	300.0	02260303021220221180010	4
1	.0	650.0	.0	300.0	200.0	03300224011010111190012	4
1	.0	675.0	.0	300.0	200.0	02270324011020221200012	4
1	.0	170.0	.0	170.0	170.0	022403000130101111230021	4
1	60.0	550.0	.0	550.0	250.0	02260300022230331240021	4
1	.0	480.0	.0	480.0	450.0	023002180110101111271025	4
1	.0	480.0	.0	480.0	450.0	02270318021030331281025	4
1	.0	400.0	.0	400.0	250.0	022503060120101111350029	4
1	.0	400.0	.0	400.0	250.0	03350306012020221360029	4
1	.0	160.0	.0	160.0	160.0	01240301023010111130002	5
1	100.00	900.0	.0	600.0	300.0	0229030104122022140002	5
1	.0	350.0	.0	200.0	100.0	02310303013010111190012	5
1	50.0	900.0	.0	450.0	200.0	03270202042130331200012	5
1	.0	600.0	.0	425.0	150.0	033003070110101111210014	5
1	.0	800.0	.0	200.0	150.0	03290306082130331220014	5
1	.0	650.0	.0	650.0	300.0	032703020320101111230015	5
1	70.0	1000.0	.0	700.0	400.0	03280202063130331240015	5
1	.0	528.0	.0	528.0	100.0	022503060220101111250017	5
1	.0	1125.0	.0	700.0	200.0	03290301033030331260017	5
1	.0	650.0	.0	300.0	200.0	022603150210101111310026	5
1	.0	1600.0	.0	300.0	200.0	03300315071030331320026	5
1	.0	149.7	.0	149.7	149.7	0227030101301011090006	11
1	120.0	794.6	.0	794.6	794.6	03280301052130330100006	11
1	.0	220.9	.0	220.4	100.0	02290302013010110210012	11
1	.0	543.7	.0	463.7	463.7	02270302022020220220012	11
1	.0	427.6	.0	427.6	307.6	02250303022010110250016	11
1	.0	803.0	.0	733.0	733.0	02270203021020220260016	11
1	.0	580.0	.0	175.0	40.0	0226022102101011051021	13
1	.0	590.0	.0	175.0	60.0	0330022102102022061021	13
1	.0	360.0	.0	360.0	52.0	0225030102301011090060	13
1	.0	2000.0	.0	400.0	50.0	03300301022030330100060	13
1	.0	800.0	.0	400.0	160.0	02280202021010110150059	13
1	90.0	1000.0	.0	300.0	160.0	03270302013130330160059	13

R TEAMS

0	120.0	623.0	.0	358.0	422.0	03310224011110110130108	2
0	60.0	580.0	.0	580.0	402.0	03350324021020220140108	2
0	.0	293.0	.0	293.0	173.0	02260301023010110251115	2
0	.0	200.0	300.0	500.0	200.0	03280201071032330261115	2
1	.0	900.0	.0	400.0	200.0	0226320902101011170104	4
1	.0	450.0	.0	450.0	200.0	0226030902102022180104	4
1	.0	200.0	.0	200.0	200.0	02250308013010111110106	4
1	71.8	970.0	.0	400.0	200.0	03290308063130331120106	4
1	56.0	500.0	.0	300.0	200.0	03250209021110111210119	4
1	100.0	700.0	.0	650.0	300.0	03290312031220221220119	4
1	.0	520.0	.0	500.0	325.0	02260204021313331290126	4
1	.0	481.0	.0	481.0	310.0	03280304032020221300126	4
1	.0	500.0	.0	350.0	350.0	02250302023010111310127	4
1	.0	900.0	.0	600.0	500.0	03280302062030331320127	4
1	.0	300.0	.0	300.0	300.0	02260301032010111330128	4
1	125.0	1400.0	.0	700.0	400.0	03290301083130331340128	4
1	.0	460.0	.0	460.0	250.0	0226030002201011110101	5
1	.0	500.0	.0	500.0	240.0	0225030004303033120101	5
1	.0	650.0	.0	400.0	125.0	02270202031010111130106	5
1	.0	620.9	.0	400.0	125.0	03270302023020221140106	5
1	.0	600.0	56.0	380.0	195.0	03270200041011111350109	5

POPULATION WITH MODEL G AIRCRAFT WITHOUT AOU
R TEAMS (Cont'd)

1	200.0	800.0	.0	400.0	300.0	03290300013130331360109	5
1	.0	140.0	.0	140.0	140.0	01270300013010111 50110	5
1	.0	500.0	.0	500.0	250.0	03300303032020221 60110	5
1	.0	500.0	.0	400.0	100.0	03260303021010111150111	5
1	.0	680.0	.0	480.0	300.0	03310203072030331160111	5
1	.0	580.0	.0	580.0	360.0	02280301031010111170116	5
1	75.3	511.6	.0	390.8	215.2	02260301043220221180116	5
1	.0	250.0	.0	250.0	250.0	02260302013010111270118	5
1	.0	364.0	.0	340.0	340.0	03300302033020221280118	5
1	.0	250.0	.0	250.0	250.0	03260303013010111291122	5
1	.0	250.0	.0	250.0	250.0	03280303013020221301122	5
1	.0	375.0	.0	375.0	250.0	02300362012010111330127	5
1	.0	650.0	.0	450.0	250.0	02300307023020221340127	5
1	.0	600.0	.0	600.0	540.0	03270212041010111 70104	7
1	60.0	1120.0	.0	750.0	700.0	03290212051130331 80104	7
1	.0	650.0	.0	600.0	540.0	02280212041010111 90105	7
1	.0	750.0	.0	700.0	630.0	03310312041020221100105	7
1	.0	630.0	.0	600.0	540.0	0227030002301011110109	7
1	.0	760.0	.0	700.0	630.0	03270300043030331120109	7
1	.0	560.0	.0	530.0	400.0	03280300023010111130110	7
1	.0	500.0	.0	450.0	400.0	03260300022020221140110	7
1	.0	850.0	.0	850.0	800.0	03300302042010111170113	7
1	.0	150.0	.0	150.0	140.0	02260301013020221180113	7
1	.0	350.0	.0	350.0	310.0	02250302013010111190114	7
1	30.0	600.0	.0	520.0	500.0	022803020321303311200114	7
1	.0	530.0	.0	500.0	450.0	02280302022010111210118	7
1	.0	1170.0	.0	750.0	680.0	032803020130303311220118	7
1	.0	550.0	.0	530.0	480.0	02260316012010111230119	7
1	.0	600.0	.0	530.0	480.0	032803160120202211240119	7
1	.0	440.0	.0	420.0	380.0	02270312012010111250122	7
1	.0	450.0	.0	420.0	380.0	03290312012020221260122	7
1	.0	160.0	.0	160.0	140.0	02230300013010111270123	7
1	.0	780.0	.0	750.0	680.0	032703000530303311280123	7
1	.0	365.0	.0	365.0	250.0	02270315012010111290124	7
1	350.0	1080.0	.0	700.0	585.0	03300315033130331300124	7
1	30.0	1030.0	.0	750.0	680.0	03260300051110111310125	7
1	.0	400.0	.0	400.0	360.0	02250300033010111320125	7
1	.0	331.9	.0	330.0	270.0	02260311013010111330126	7
1	.0	1020.0	.0	800.0	700.0	03270311033030331340126	7
1	.0	190.0	.0	190.0	170.0	01260302013010111350127	7
1	110.0	540.0	.0	600.0	540.0	03280302023130331360127	7
1	.0	198.7	.0	198.7	198.7	02260302013010110 70104	11
1	.0	352.4	.0	352.4	283.0	03290302022020220 80104	11
1	.0	395.5	.0	395.5	295.5	02250307022010110110111	11
1	100.0	747.1	.0	600.0	600.0	03280207043130330120111	11
1	.0	593.0	.0	520.0	520.0	02300323011010110171109	11
1	.0	605.0	.0	535.0	535.0	02250323011020220181109	11
1	.0	195.3	.0	195.3	195.3	02290302013010110130107	11
1	.0	719.1	.0	630.0	630.0	03280302033030330140107	11
1	.0	523.0	.0	450.0	450.0	02290303032030330150108	11
1	.0	660.0	.0	590.0	590.0	02260203021020220160108	11
1	.0	255.0	.0	255.0	135.0	02290303012010110190110	11
1	.0	308.9	.0	308.9	188.9	03330303023020220200110	11
1	110.0	665.0	.0	665.0	600.0	02260208021220221160111	7
1	.0	450.0	.0	400.0	380.0	02280308022010111150111	7
1	.0	356.9	.0	356.9	226.0	02260306012010110230115	11
1	.0	300.1	.0	300.1	169.4	02290306013020220240115	11
1	.0	516.9	.0	436.0	436.0	02290202021010110270118	11
1	.0	821.6	.0	740.0	740.0	03280302043030330280118	11
1	.0	326.4	.0	326.4	200.0	02270315012010110291119	11
1	.0	292.3	.0	292.3	200.0	02280315013020220301119	11
1	.0	505.0	.0	435.0	435.0	02270302041010110310120	11

**POPULATION WITH MODEL G AIRCRAFT WITHOUT AOU
R TEAMS (Cont'd)**

1	.0	893.8	.0	813.0	813.0	03270302043030330320120	11
1	.0	200.0	475.0	395.0	395.0	02280204041001110330122	11
1	.0	325.3	.0	325.3	325.3	03330304023020220340122	11
1	108.0	500.0	100.0	450.0	400.0	02270325041111110350124	11
1	.0	800.0	.0	600.0	600.0	03270301073030330360124	11
1	100.0	711.0	.0	540.0	540.0	02270203021130330370127	11
1	.0	432.0	.0	350.0	350.0	03290303022020220380127	11
1	.0	200.0	.0	200.0	200.0	02260301013010110190104	13
1	300.0	1100.0	.0	250.0	250.0	03300305013130330200104	13
1	.0	400.0	.0	325.0	35.0	02270309011010110 30110	13
1	100.0	1700.0	.0	250.0	40.0	03290309042136330 40110	13
1	.0	520.0	.0	500.0	80.0	02280213012010110131120	13
1	.0	438.1	67.3	367.6	73.0	0227030102202220141120	13
1	.0	460.0	.0	180.0	180.0	02270301012010110210115	13
1	.0	1800.0	.0	250.0	50.0	03290301023030330220115	13
1	.0	300.0	.0	210.0	200.0	02260302013010110230105	13
1	100.0	1900.0	.0	300.0	100.0	03320310043130330240105	13
1	50.0	420.0	.0	200.0	20.0	03280301033110110110107	13
1	70.0	730.0	.0	300.0	30.0	03270201032220220120107	13
1	.0	300.0	.0	300.0	40.0	02270303013010110250112	13
1	50.0	1100.0	.0	300.0	170.0	03290302013130330260112	13
1	75.0	400.0	.0	300.0	50.0	02260301022210110270109	13
1	150.0	850.0	.0	500.0	200.0	03280301013130330280109	13
1	.0	800.0	.0	400.0	40.0	02280201011010110290155	13
1	.0	1200.0	.0	200.0	40.0	03270301023030330300155	13
1	.0	340.0	.0	280.0	150.0	02270308031010110310154	13
1	.0	550.0	.0	500.0	100.0	03310308048020220320154	13
1	.0	450.0	.0	430.0	50.0	02250306013010110330119	13
1	50.0	600.0	.0	200.0	50.0	02270306061220220340119	13
1	.0	300.0	.0	270.0	40.0	02250306012010110410157	13
1	120.0	300.0	700.0	800.0	40.0	03260306022121220420157	13
1	.0	450.0	.0	200.0	60.0	02270208021010110430116	13
1	.0	500.0	.0	450.0	60.0	02260308021020220440116	13
1	.0	410.0	.0	350.0	20.0	02260308023010110450118	13
1	.0	350.0	.0	330.0	20.0	03300308013020220460118	13
1	.0	480.0	.0	180.0	20.0	02260213012010110470108	13
1	.0	450.0	.0	300.0	30.0	03360213021020220480108	13
1	.0	400.0	.0	300.0	50.0	02260302032010110490114	13
1	.0	1100.0	.0	250.0	120.0	03290302013030330500114	13
1	.0	200.0	.0	200.0	200.0	02250302013010110170158	13
1	.0	1900.0	.0	400.0	50.0	03290302023020220180158	13

S TEAMS

0	520.0	200.0	580.0	450.0	200.0	03290201103323330100205	2
0	22.0	840.0	.0	840.0	820.0	03290301042010110 90205	2
0	.0	876.0	.0	876.0	795.0	03280115041030330 10201	2
0	.0	1217.0	.0	1217.0	683.0	03280115071030330 20201	2
0	100.0	900.0	.0	900.0	400.0	03290133021203330 40202	2
0	57.0	586.0	.0	586.0	406.0	03270133021130330 30202	2
0	.0	700.0	100.0	800.0	700.0	02290106071011110 50203	2
0	.0	800.0	.0	800.0	800.0	02260106031030330 61203	2
0	22.0	771.0	.0	771.0	571.0	03300213041110110 71204	2
0	22.0	497.0	.0	497.0	497.0	02290313012020220 81204	2
0	.0	591.0	.0	491.0	591.0	02260303032010110110207	2
0	.0	1427.0	.0	1337.0	555.0	03290303052030330120207	2
1	.0	900.0	.0	400.0	300.0	02300120021010111 30202	4
1	.0	2500.0	.0	400.0	300.0	03291120061030331 40202	4
1	80.0	800.0	.0	500.0	400.0	03270102041110111 70201	5
1	.0	1300.0	.0	800.0	700.0	03300103092030331 80201	5
1	.0	890.0	.0	250.0	180.0	02270104011010111 90202	5
1	70.0	830.0	.0	240.0	175.0	03280104031220221100202	5
1	.0	595.0	.0	450.0	150.0	0227010604101011111203	5

**POPULATION WITH MODEL G AIRCRAFT WITHOUT AOU
S TEAMS (Cont'd)**

1	.0	564.0	.0	450.0	150.0	02290106041030331121203	5
1	.0	600.0	.0	550.0	500.0	02260103041010111 10201	7
1	.0	1900.0	.0	800.0	720.0	03300103071030331 20201	7
1	.0	630.0	.0	630.0	560.0	02280101031010111 30202	7
1	70.0	860.0	.0	750.0	700.0	03270101053130331 40202	7
1	.0	360.0	.0	360.0	320.0	02280101023010111 50203	7
1	130.0	920.0	.0	750.0	700.0	03270101052130331 60203	7
1	.0	807.7	.0	637.0	637.0	02270108061030330 10201	11
1	100.0	782.0	.0	712.0	712.0	03290108053130330 20201	11
1	.0	519.0	.0	439.7	439.7	03270102031010110 30203	11
1	.0	501.0	.0	420.0	420.0	02260101021020220 40203	11
1	.0	524.7	.0	444.7	444.7	02270102021010110 50202	11
1	.0	1346.0	.0	820.0	820.0	03280108102030330 60202	11
1	100.0	850.0	.0	300.0	150.0	03260101031110110 10201	13
1	210.0	1000.0	.0	300.0	150.0	03290101032130330 20201	13
1	100.0	700.0	.0	150.0	35.0	03290107021110110 70202	13
1	300.0	800.0	1000.0	400.0	60.0	03320107051323330 80202	13
1	.0	900.0	.0	300.0	60.0	02260101041010110350203	13
1	.0	2300.0	.0	300.0	20.0	03300101021030330360203	13
1	.0	438.0	.0	438.0	30.0	02290101021010110370251	13
1	250.0	2000.0	.0	800.0	400.0	03310101091330330380251	13
1	.0	700.0	.0	300.0	100.0	02260100041010110390253	13
1	80.0	820.0	.0	300.0	100.0	03280100031220220400253	13

**BASES WITH G MODEL AIRCRAFT WITH AOU
E TEAMS**

0	.0	190.0	.0	190.0	190.0	02290301013010110110005	1
0	.0	1970.0	.0	700.0	300.0	03280207071030330120005	1
0	.0	308.2	.0	308.2	156.7	02250304013010110170008	1
0	.0	661.3	.0	586.7	548.2	03280304021020220180008	1
0	.0	500.0	.0	450.0	435.0	02250303051010110210010	1
0	200.0	1100.0	.0	800.0	304.0	03270304021130330220010	1
0	.0	690.0	.0	690.0	400.0	03270212021010110310016	1
0	.0	1800.0	.0	900.0	400.0	0330031061030330320016	1
0	.0	520.0	.0	100.0	200.0	02260202051010111 90006	3
0	2235.0	430.0	.0	200.0	240.0	03350302083330331100006	3
0	.0	390.0	.0	240.0	150.0	02270302013010111110007	3
0	.0	390.0	.0	300.0	257.0	03260302032020221120007	3
0	.0	420.0	.0	420.0	275.0	02270313022010111130009	3
0	50.0	1200.0	.0	400.0	300.0	03290313043030331140009	3
0	.0	550.0	.0	300.0	300.0	03270310031010111170011	3
0	.0	320.0	.0	280.0	180.0	04350308013020221180011	3
0	.0	540.0	.0	530.0	320.0	02260308013010111250018	3
0	3700.0	1100.0	.0	360.0	360.0	04340308101320331260018	3
0	.0	227.0	.0	227.0	227.0	01240301013010111290020	3
0	.0	750.0	.0	750.0	650.0	03280301043020221300020	3
0	.0	250.0	.0	250.0	200.0	02290303022010111310021	3
0	200.0	800.0	.0	350.0	400.0	03300302043130331320021	3
0	.0	400.0	.0	350.0	350.0	02270305022010111330023	3
0	85.0	900.0	.0	350.0	350.0	03270301073130331340023	3
0	.0	250.0	.0	60.0	150.0	03290302023010111350024	3
0	90.0	1000.0	.0	200.0	200.0	03290302053130331360024	3
0	.0	480.3	.0	336.3	96.6	02250305013020220 60004	10
0	.0	481.1	.0	486.1	100.7	02260305041010110 50004	10
0	.0	181.9	.0	159.9	84.5	02270305013010110 90006	10
0	4.1	1457.3	.0	518.1	88.2	03290305061220220100006	10
0	.0	165.9	.0	135.4	105.1	02300306012010110110007	10
0	.0	497.5	.0	481.8	69.2	02270306021020220120007	10
0	.0	566.5	.0	555.5	116.4	02260314031010110130008	10
0	169.5	1682.6	1175.8	460.2	107.7	03340214101323330140008	10
0	.0	426.5	.0	285.7	109.5	02250305013010110170010	10

**BASES WITH G MODEL AIRCRAFT WITH AOU
E TEAMS (Cont'd)**

0	3.1	782.0	.0	587.3	138.7	03280305033130330180010	10
0	23.6	603.4	.0	800.1	122.7	02270314031110110190011	10
0	46.9	527.9	.0	560.1	113.0	03270214021220220200011	10
0	3.0	500.0	3.0	350.8	124.8	02250304051010110210012	10
0	94.1	813.3	.0	643.6	242.3	03270304103130330220012	10
0	38.3	654.7	.0	529.8	110.5	03280312041110110270015	10
0	107.9	537.8	.0	622.8	108.7	02270312021220220280015	10
0	.0	479.6	.0	351.8	104.6	02260313021010110291016	10
0	.0	520.9	.0	384.4	111.2	02250313032010110301016	10
0	.0	277.7	.0	134.5	134.5	02260303013011110310017	10
0	73.2	572.4	.0	556.8	155.5	03280303041220220320017	10
0	.0	362.2	.0	354.6	106.1	02270302043010110330019	10
0	34.4	813.8	.0	709.7	156.2	03270302013130330340019	10

R TEAMS

0	.0	700.0	.0	600.0	500.0	03260202031010110230111	1
0	.0	850.0	.0	700.0	500.0	03270302013030330240111	1
0	.0	350.0	.0	350.0	190.0	02260303011010110250112	1
0	60.0	600.0	.0	500.0	350.0	03310203031220220260112	1
0	.0	400.0	.0	400.0	200.0	02260303013010110270113	1
0	100.0	550.0	.0	550.0	500.0	02270303041220220280113	1
0	.0	300.0	.0	300.0	300.0	02270304013010110290115	1
0	.0	700.0	.0	700.0	600.0	03280306012020220300115	1
0	.0	750.0	.0	750.0	400.0	03270201031010110330117	1
0	.0	520.0	.0	520.0	390.0	02260301033020220340117	1
0	.0	875.0	.0	875.0	575.0	02260308032010110 10114	1
0	.0	350.0	.0	350.0	200.0	02290306013020220 20114	1
0	200.0	900.0	.0	1000.0	300.0	02280302031110110 90104	1
0	180.0	200.0	1500.0	350.0	200.0	03290202021322330100104	1
0	.0	520.0	.0	520.0	390.0	02260309042010110130106	1
0	200.0	300.0	1000.0	710.0	300.0	03300209101323330140106	1
0	.0	650.0	.0	650.0	650.0	03270305032010110151107	1
0	100.0	1100.0	.0	800.0	400.0	03280305013130330161107	1
0	.0	350.0	.0	350.0	200.0	02260303022010110190109	1
0	30.0	650.0	.0	600.0	200.0	0328030302220220200109	1
0	.0	500.0	.0	300.0	200.0	02260306031010111 70105	3
0	.0	370.0	.0	370.0	270.0	02250306013020221 80105	3
0	.0	430.0	.0	200.0	100.0	02300304013010111150110	3
0	.0	500.0	.0	250.0	250.0	03300304022020221160110	3
0	.0	315.0	.0	250.0	250.0	02280301033010111190112	3
0	.0	200.0	.0	200.0	200.0	02290301013020221200112	3
0	.0	250.0	.0	250.0	250.0	02260301013010111210114	3
0	90.0	900.0	.0	300.0	150.0	03270301043130331220114	3
0	.0	170.0	.0	170.0	170.0	02250301013010111230115	3
0	.0	700.0	.0	220.0	220.0	03300301043030331240115	3
0	54.0	450.0	.0	400.0	300.0	02240321012110111271119	3
0	50.0	450.0	.0	400.0	300.0	02250321012220221281119	3
0	.0	400.0	.0	400.0	200.0	02250210011010111370125	3
0	120.0	570.0	.0	300.0	300.0	02290210021220221380125	3
0	92.1	477.0	.0	503.2	129.2	02270217031110110 70105	10
0	88.5	372.6	.0	472.7	113.0	02270317031220220 80105	10
0	94.1	612.3	.0	598.5	149.3	03300305051110110150109	10
0	.0	252.2	.0	214.6	118.4	02310305013020220160109	10
0	.0	392.1	.0	362.9	104.5	02260202051010110230113	10
0	.0	361.9	.0	204.9	88.9	02290302033020220240113	10
0	48.5	571.4	.0	505.8	96.5	03270302031110110250114	10
0	101.6	717.7	.0	575.5	181.7	03260302013130330260114	10

S TEAMS

0	.0	520.0	.0	410.0	300.0	03270103041010110 30201	1
0	.0	1800.0	.0	1100.0	400.0	03280103071030330 40201	1
0	.0	670.0	.0	630.0	450.0	03270103021010110 51202	1
0	60.0	650.0	.0	620.0	450.0	02270103041220220 61202	1
0	.0	750.0	.0	750.0	400.0	03270112021010110 70203	1

**BASES WITH G MODEL AIRCRAFT WITH AOU
S TEAMS (Cont'd)**

0	.0	1600.0	.0	1200.0	400.0	03280112041030330	80203	1
0	.0	660.0	.0	660.0	400.0	02250307022010110350218		1
0	150.0	1150.0	.0	500.0	400.0	03280307031130330360218		1
0	60.0	615.0	.0	600.0	500.0	02250104022110111	10201	3
0	3800.0	500.0	.0	400.0	400.0	03340101151330331	20201	3
0	100.0	600.0	.0	300.0	300.0	02270108041110111	30202	3
0	500.0	1000.0	400.0	250.0	250.0	03290101041321331	40202	3
0	.0	600.0	.0	350.0	350.0	02260104041010111	50203	3
0	.0	950.0	.0	250.0	250.0	03280101042030331	60203	3
0	60.1	676.5	.0	623.2	123.4	03290104031110110	10202	10
0	.0	1094.0	.0	772.4	134.1	03280104022030330	20202	10
0	.0	780.4	.0	531.0	135.7	03280108061010110	30203	10
0	46.9	1708.6	.0	670.0	172.4	03280108061230330	40203	10

APPENDIX B

HISLOG - HISTOGRAM PLOTTING: FORTRAN SOURCE CODE

```
//HISLOG Job (SRL, 001), M. Hoffman, MSGLevel=1, Class=D
//EXEC FORTGCLG, REGION. GO=240K
//FORT. SYSIN DD*
      Dimension Title(36,50),NINT(50),FMT(36),V(600),SINT(600),TI(36)
      Dimension X(600,50),XX(50,50),XR(60,50),XS(50, 50)
C      This statement reads the following (1) IP Options in the subroutine
C      (2) NV=The number of variables to be plotted,
C      (3) NVP=The number of cards to be read
C      and (4) the INT=The number of point on the Y axis
C      on the Histograms.
C
      READ (5,90,END=500) IP, NV, NVP, (NINT(L),L=1,NV)
C
C      This statement reads the BMD type format statement
90  Format(2I2,I3,36I2)
C
      Read(5,91)FMT
91  Format(18A4/18A4)
C
C      These statements write the title of the data being graphed
C
C      This card reads the title cards. One per graph. These must be in
C      the order of the variable per graph to be plotted.
      Read(5,92)((Title(L,J),L=1,18),J=1,NV)
92  Format(18A4)
      M=NV-14
C
C      This card reads the data. The data must be in the BMD type
C      two dimensional array with one column per variable.
      Read(5,FMT)((X(L,J),J=1,M),L=1,NVP)
      Write(6,34)
94  Format(1H1,3X,'VAR 1',7X,'VAR 2',7X,'VAR 3',7X,'VAR 4',7X,'VAR 5',
17X,'VAR 6',6X,'VAR 7',6X,'VAR 9',6X,'VAR 10')
      Write(6,35)((X(L,J),J=1,9),L=1,NVP)
95  Format ('9(F10.3,2X)')
      Write (6,36)
96  Format(1H1,3X,'VAR 23',6X,'VAR 24',6X,'VAR 25',6X,'VAR 26',6X,
1'VAR 27',7X,'VAR 28',7X,'VAR 29',7X,'VAR 31',7X,'VAR 32')
      Write(6,37)((X(L,J),J=10,18),L=1,NVP)
97  Format(/9(F10.3,2X))
      D0 25 J=1,NVP
      X(J,19)=X(J,2)+X(J,3)
      X(J,20)=X(J,19)+X(J,1)
      X(J,21)=X(J,11)+X(J,12)
      X(J,22)=X(J,21)+X(J,10)
      X(J,23)= (X(J,1)+X(J,10))/2.
      X(J,24)= (X(J,2)+X(J,11))/2.
      X(J,25)= (X(J,3)+X(J,12))/2.
      X(J,26)= (X(J,4)+X(J,13))/2.
      X(J,27)= (X(J,5)+X(J,14))/2.
      X(J,28)= (X(J,6)+X(J,15))/2.
      X(J,29)= (X(J,7)+X(J,16))/2.
      X(J,30)= (X(J,8)+X(J,17))/2.
      X(J,31)= (X(J,19)+X(J,21))/2.
      X(J,32)= (X(J,20)+X(J,22))/2.
```

```
//HISLOG Job (SRL, 001), M. Hoffman, MSGLevel=1, Class=D
//EXEC FORTGCLG, REGION. GO=240K
//FORT. SYSIN DD*

25  Continue
    Write(6,38)
38  Format(1H1,2X,'VAR 45',7X,'VAR 46',6X,'VAR 47',6X,'VAR 48',6X,
1'VAR 49',6X,'VAR 50',6X,'Var 51',6X,'VAR 52',6X,'VAR 53',6X,
2'VAR 54')
    Write (6,39)((X(J,L),L=19,28),J=1,NVP)
39  Format(/10(F10.3,2X))
    Write(6,40)
40  Format (1H1,2X,'VAR 55',6X,'VAR 57',6X,'VAR 63',6X,'VAR 64')
    Write(6,41)((X(J,L),L=29,32),J=1,NVP)
41  Format(/4(F10.3,2X))
    Do 100 K=1,NV
    Do 50 J=1,NVP
50  V(J)=X(J,K)
    Do 75 J=1,18
75  TI(J)=Title (J,K)
100  Call HISTOG(V,NVP,NINT,VMU,SIGM,SKEW,VMIN,VMAX,IP,SINT,TL,TN)
500  Stop
    End
```

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//HISLOG Job (SRL, 001), M. Hoffman, MSGLevel=1, Class=D
 //EXEC FORTGCLG, REGION. GO=240K
 //FORT. SYSIN DD*

63	IF V(I) - UPBD)64,64,65	HISTOG
64	I1=I1+1	HISTOG
	V(I1)=V(I)	HISTOG
65	Continue	HISTOG
	NV=I1	HISTOG
	VMIN=ALBD	HISTOG
	VMAX=UPBD	HISTOG
	Go to (40,42,40,60,60),IP	HISTOG
C		HISTOG
C	Calculate Interval Size.	HISTOG
C		HISTOG
47	VMIN=ALBD	HISTOG
	VMAX=UPBD	HISTOG
	Go to 43	HISTOG
40	ANINT=NINT	HISTOG
	Do 48 I=1,NINT	HISTOG
48	SINT(I)=(VMAX-VMIN)/ANINT	HISTOG
	Go to 43	HISTOG
42	ANINT=VMAX-VMIN+1.0	HISTOG
	NINT=ANINT	HISTOG
	Do 49 I=1,NINT	HISTOG
49	SINT(I)=1.0	HISTOG
	VMIN=VMIN+.05	HISTOG
	VMAX=VMAX+.05	HISTOG
C		HISTOG
C	Calculate Ranges and Frequencies and Draw Histogram.	HISTOG
C		HISTOG
43	Write(6,5)	HISTOG
	Write(6,6)	HISTOG
	Write(6,5)	HISTOG
	ALOB2(I)=VMIN	HISTOG
	NV1=NV	HISTOG
	IF(NINT-200)45,45,44	HISTOG
44	Write(6,9)	HISTOG
	Go To 46	HISTOG
45	Do 23 I=1,NINT	HISTOG
	ALOB1(I)=ALOB2(I)	HISTOG
	ALOB2(I+1)=ALOB1(I)+SINT(I)	HISTOG
	L=0	HISTOG
	NF(I)=0	HISTOG
	IRNV1)22,23,22	HISTOG
22	Do 20 J=1,NV1	HISTOG
	IF(NINT-I)16,19,16	HISTOG
16	IF(V(J)-ALOB2(I+1))18,18,17	HISTOG
17	L=L+1	HISTOG
	V(L)=V(J)	HISTOG
	Go to 20	HISTOG
18	NF(I)=NF(I)+1	HISTOG
	Go to 20	HISTOG
19	NF(I)=NV1	HISTOG
	ALOB2(I+1)=VMAX	HISTOG
	Go To 24	HISTOG
20	Continue	HISTOG
	NV1=L	HISTOG
23	Continue	HISTOG
C		HISTOG
C	Scale Frequencies if Necessary	HISTOG
C		HISTOG
24	NFMAX=NF(I)	HISTOG
	Do 26 I=1,NINT	HISTOG
	NN(I)=NF(I)	HISTOG
	IF(NF(I)-NFMAX)26,26,25	HISTOG

//FORT. SYSIN DD*

(1X,F8,1.4F9,1.9X,2F2,0.2X,2F2,0)

31

APPENDIX C

BMD01D — General Statistics: JCL and Control Cards

```
//BMDEXEC JOB (HED024,KD),G.P.CHUBB, MSGLEVEL=1
// EXEC BMDEXEC
//BMD.PROG DD DSN=SYS1.BMDLOAD(BMD01D)
//GO.SYSIN DD*
PROBLMPCPLTN00167044002010200
TRNGEN04511002000003
TRNGEN04611045000001
TRNGEN04711024000025
TRNGEN04811047000023
TRNGEN04911001000023
TRNGEN05011002000024
TRNGEN05111003000025
TRNGEN05211004000026
TRNGEN05311005000027
TRNGEN05411006000028
TRNGEN05511007000029
TRNGEN05611008000030
TRNGEN05711009000031
TRNGEN05811010000032
TRNGEN05911011000033
TRNGEN06011012000034
TRNGEN06111013000035
TRNGEN06211014000036
TRNGEN06311045000047
TRNGEN06411046000048
1X,F8 1.4F9,1.9X,5F2.0,7F1.0,F2.0,2F1.0,F2.0,1X,F2.0
FINISH
```

01

APPENDIX D

BMD02D — Correlation Analysis: JCL and Control Cards

```
//BMDEXEC JOB (HED024,KD),G.P.CHUBB, MSGLEVEL= 1,CLASS= C
// EXEC BMDEXEC
//BMD.PROG DD DSN=SYS1.BMDLOAD(BMD02D)
//GO.SYNSIN DD
```

```
PROBLMPOPLS 44 270 20
```

0200001

```
TRNGEN04511002000003
```

```
TRNGEN04611045000001
```

```
TRNGEN04711024000025
```

```
TRNGEN04811047000023
```

```
TRNGEN04911001000023
```

```
TRNGEN05011002000024
```

```
TRNGEN05111003000025
```

```
TRNGEN05211004000026
```

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TRNGEN05311005000027
```

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TRNGEN05411006000028
```

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TRNGEN05511007000029
```

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TRNGEN05611008000030
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TRNGEN05711009000031
```

```
TRNGEN05811010000032
```

```
TRNGEN05911011000033
```

```
TRNGEN06011012000034
```

```
TRNGEN06111013000035
```

```
TRNGEN06211014000036
```

```
TRNGEN06311045000047
```

```
TRNGEN06411046000048
```

```
(1X,F8.1,4F9.1,9X,5F2.0,7F1.0,F2.0,2F1.0,F2.0,1X,F2.0)
```

```
FINISH
```

APPENDIX E

DESCRIPTIVE STATISTICS

General Statistics

<i>Group</i>	<i>N</i>
I. SAC Crews	269
H Bases	102
G Bases	167
E Crews	72
R Crews	150
S Crews	47
II. H Bases With AOU	64
E Crews	8
R Crews	45
S Crews	11
III. H Bases Without AOU	38
E Crews	10
R Crews	22
S Crews	6
IV. G Bases With AOU	54
E Crews	24
R Crews	21
S Crews	9
V. G Bases Without AOU	113
E Crews	30
R Crews	62
S Crews	21

GENERAL STATISTICS FROM SAC NAVIGATOR-RADAR NAVIGATOR QUESTIONNAIRES, N = 270

Navigator Variables	1	2	3	4	5	3	7	9	10	45	46
Mean $\bar{X}$	12.0248	303.8223	178.6060	408.7141	280.2090	2.1555	26.8658	5.7145	2.2925	482.4263	494.4529
s.d. (s)	43.7393*	282.8916	254.7203*	177.7182	180.1824	.4374	1.5913	6.8626*	1.5226	202.5852	220.7074
Range	520.0000	1030.0000	1309.0000	1000.0000	800.0000	2.0000	8.0000	62.0000	9.0000	1160.0000	1360.0000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	113.2353	524.3987	317.3994	544.0999	345.3401	2.6999	28.4213	6.4185	3.6185	841.8109	955.0464
s.d. (s)	383.2117*	542.7678*	447.8457*	228.1060	228.2192	.5054	2.1693	5.9500	2.6954	456.3562	647.0288
Range	3800.0000	2500.0000	2550.0000	1222.8999	950.0000	3.0000	11.0000	36.0000	18.0000	2708.3997	4650.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	62.6298	414.1169	248.0086	475.3992	312.7815	2.4277	27.6434	6.5666	5.9111	662.1140	724.7434
s.d. (s)	194.0915*	372.4197	323.8191*	159.8196	181.8146	.3353	1.3823	6.0537	3.3383	267.5891	358.8320
Range	1930.0000	1700.0000	1445.0000	916.0000	850.0000	2.0000	17.5000	36.0000	18.0000	1470.3499	2427.9001

* s.d. > $\bar{X}$

GENERAL STATISTICS OF NAVIGATOR-RADAR NAVIGATOR TEAMS FROM H BASES, N = 103

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	8.2039	6.7951	455.0413	413.7422	294.0879	2.0776	26.8929	7.3786	2.2524	461.8364	470.0403
s.d. (s)	29.9664*	46.6718*	199.5883	164.8228	184.2249	.3866	1.6458	5.5233	1.6389	204.9291	219.3255
Range	200.0000	433.5999	1144.0000	800.0000	795.0000	2.0000	7.0000	29.0000	7.0000	1144.0000	1344.0000

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	126.6647	59.7796	770.8755	586.1541	367.9899	2.6699	28.3589	7.4398	3.5446	830.6548	957.3196
s.d. (s)	256.2346*	292.8796*	363.1328	231.4715	248.0863	.5467	2.2189	5.1700	3.0775	439.0891	626.7617
Range	1500.0000	1846.6999	2412.9001	1360.0000	950.0000	3.0000	11.0000	29.0000	18.0000	2350.0000	3415.0996

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	67.4341	33.2873	612.9595	499.9478	331.0378	2.3737	27.6259	7.3592	3.0485	646.2451	713.6789
s.d. (s)	131.9653*	147.6012*	208.3208	146.9034	191.4171	.3324	1.4179	5.1720	1.9180	258.6604	357.5862
Range	750.0000	923.3499	1297.5001	698.5001	850.0000	2.0000	7.0000	29.0000	18.0000	1307.9001	1907.9001

* s.d. > $\bar{X}$

GENERAL STATISTICS OF NAVIGATOR-RADAR NAVIGATOR TEAMS FROM G BASES

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	14.3215	487.0308	7.8500	405.3699	271.4099	2.1975	26.8558	6.3532	2.2993	494.8809	509.2022
s.d. (s)	50.0118*	193.9449	58.6714*	184.3937	176.0849	.4547	1.5631	7.6355*	1.4416	199.3521	219.3513
Range	520.0000	890.0000	590.0000	940.0000	780.0000	1.0000	8.0000	62.0000	9.0000	890.0000	1160.0000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	105.0133	810.9714	37.9826	515.1711	331.6416	2.7245	28.4545	5.8023	3.4969	848.9534	953.9666
s.d. (s)	442.5835*	454.2878	192.3087*	224.3584	213.4504	.4732	2.1411	6.1608*	2.3923	480.8237	657.1711
Range	3590.0000	2390.0000	1500.0000	1187.0000	880.0000	2.0000	11.0000	36.0000	14.0000	2708.3997	4650.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	59.6671	649.0000	22.9164	460.2695	301.5247	2.4610	27.6551	6.0778	2.8982	671.9155	731.5825
s.d. (s)	223.9245*	257.2642	99.7856*	165.4133	174.6822	.3331	1.3472	6.4904	1.4985	272.4627	359.4050
Range	1930.0000	1453.5000	750.0000	916.5000	812.5000	2.0000	8.5000	36.0000	15.0000	1462.4497	2420.0000

* s.d. > $\bar{X}$

GENERAL STATISTICS OF SAC NAVIGATOR-RADAR NAVIGATOR E TEAMS, N = 74

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	3.4716	322.2837	116.8512	370.5955	239.4901	2.1031	26.6241	7.3648	2.0135	439.1321	442.6038
s.d. (s)	15.8733*	239.87224	214.2659	186.7663	154.7022	.4214	1.6492	6.3493	1.2024	167.7258	173.6419
Range	120.0000	800.0000	875.0000	740.0999	743.0000	2.0000	7.0000	36.0000	4.0000	725.3000	725.3000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	151.7593	634.3911	194.2526	514.9207	313.6187	2.6892	24.4457	7.2567	3.7297	826.6423	990.4014
s.d. (s)	518.9189*	508.2053	343.6277*	199.0526	209.9629	.5433	2.2935	6.6841	2.8203	450.0557	722.8818
Range	3700.0000	2000.0000	1400.0000	1025.0000	900.0000	3.0000	10.0000	36.0000	17.0000	2658.3997	4600.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	77.6154	478.3372	185.5519	442.7581	276.5539	2.3986	27.6348	7.3108	1.8716	633.8869	711.5019
s.d. (s)	259.3042*	333.7542	259.9993*	141.3035	162.7227	.3359	1.4095	6.4026	1.6192	238.3974	374.2754
Range	1850.0000	1245.0000	950.0000	701.5000	806.5000	2.0000	7.0000	36.0000	17.0000	1422.9497	2470.5000

* s.d. < $\bar{X}$

GENERAL STATISTICS OF SAC NAVIGATOR-RADAR NAVIGATOR R TEAMS, N = 149

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	9.9846	255.4510	192.6391	398.4302	274.4326	2.1006	26.7779	6.4899	2.0805	448.0801	458.0645
s.d. (s)	30.7813*	265.0415*	241.1353*	172.5880	176.6839	.3973	1.5674	7.2479*	1.4119	191.4202	202.4735
Range	200.0000	1030.0000	950.0000	1000.0000	800.0000	2.0000	8.0000	62.0000	7.0000	890.0000	960.0000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	57.0847	372.7183	354.7971	517.3408	333.2471	2.6577	28.2143	6.0738	3.1815	727.5088	784.5947
s.d. (s)	110.8043*	435.3965*	448.4316*	218.6498	221.8243	.5021	2.0636	5.3509	2.4769	373.5503	417.1870
Range	1000.0000	1900.0000	2500.0000	1360.0000	950.0000	3.0000	11.0000	30.0000	18.0000	2400.0000	2400.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	33.5345	314.0847	273.7192	457.8884	303.8413	2.3791	27.4961	6.2818	2.6303	242.0999	242.0999
s.d. (s)	58.6045*	314.2729*	315.1919*	141.7617	172.0521	.3157	1.3478	5.7863	1.5382	1.1461	1.0926
Range	500.0000	1130.0000	1485.0000	698.5001	750.0000	1.5000	8.5000	34.5000	18.0000	1485.0000	1490.0000

* s.d. > $\bar{X}$

GENERAL STATISTICS OF NAVIGATOR-RADAR NAVIGATOR STEAMS, N = 47

Navigator's Variables	1	2	3	4	5	6	7	9	10	45	46	48
Mean $\bar{X}$	31.9595	428.1753	230.4392	500.4717	361.7827	2.3829	27.2339	6.4042	3.4042	658.6121	690.5715	
s.d. (s)	83.8044*	348.2690	323.5144*	176.6059	198.0604	.4861	1.5485	6.2148	1.8296	191.1376	232.9649	
Range	520.0000	900.0000	1300.0000	750.0000	765.0000	1.0000	6.0000	33.0000	9.0000	1140.0000	1340.0000	

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	230.5934	832.1401	393.7034	664.2399	434.5849	2.8723	29.0211	6.1915	4.8208	1225.8423	1456.4358
s.d. (s)	593.1553*	701.3071	539.3565	266.7222	251.2829	.3924	2.1891	6.3233*	2.7079	542.1909	822.5193
Range	3800.0000	2500.0000	2000.0000	1097.0000	930.0000	2.0000	10.0000	33.0000	14.0000	2083.9998	3850.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	131.2764	630.1569	312.0708	582.3547	398.1831	2.6277	28.1274	6.2979	4.1170	942.2271	1073.5029
s.d. (s)	303.1631*	472.6223	401.1138*	193.5502	211.5378	.3174	1.2804	6.2165	1.7699	304.0962	442.8115
Range	1930.0000	1700.0000	1425.0000	801.5000	820.0000	1.5000	6.0000	33.0000	15.0000	1395.0000	2182.5000

* s.d. > $\bar{X}$

H BASES WITH AOU: POPULATION = 64

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	9.5313	8.0250	457.4128	416.6333	332.0183	2.0625	26.9844	2.5000	6.7031	465.4375	474.9688
s.d. (s)	33.3274	54.5274	216.4085	158.3980	160.0315	.3903	1.7365	.7500	4.9927	222.3509	241.0073
Range	200.0000	433.5999	1144.0000	644.0000	720.0000	2.0000	7.0000	19.0000	7.0000	1144.0000	1344.0000

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	111.6953	79.0203	756.1555	623.4133	396.0835	2.7031	28.3906	2.5156	7.0000	835.1758	946.8711
s.d. (s)	236.4070	344.4573	296.9297	241.4063	200.0579	.4899	2.2954	.7498	5.3997	418.3694	598.8098
Range	1071.0999	1846.7000	1312.8999	1222.8999	875.0000	2.0000	11.0000	27.0000	18.0000	2343.9998	3368.7996

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	60.6133	43.5226	606.7827	520.0222	364.0500	2.3828	27.6875	2.5078	5.6562	650.3052	710.9185
s.d. (s)	124.6255	173.4616	178.3735	147.1160	150.3581	.3029	1.3821	.6987	3.6131	260.0376	360.2913
Range	600.0000	923.3499	762.5000	699.0000	662.5000	1.0000	6.5000	2.0000	16.0000	1307.9000	1907.9002

Corrected Values Variables	1	2	23*	24	49**	50**
Mean ($\bar{X}$)	101.6667	256.8000	238.2800	1011.2400	192.0000	-
s.d. (s)	54.5588	250.0330	303.5295	848.0050	228.5990*	-
n	6	2	30	5	5	-

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in the calculations.

H BASES WITH AOV: E TEAMS: n = 8

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	15.0000	-	559.6250	484.6250	274.6250	2.1250	27.3750	9.3750	2.7500	559.6250	559.6250
s.d. (s)	39.6862*	-	155.1166	152.7489	170.0728	.3307	1.2185	5.5666	1.1989	183.4387	183.4387
Range	120.0000	-	593.0000	493.0000	565.0000	1.0000	3.0000	18.0000	4.0000	593.0000	593.0000

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	43.1250	-	678.3623	485.9499	309.3750	2.5000	28.5000	10.5000	2.0000	678.3623	781.4573
s.d. (s)	58.0375*	-	336.9871	136.5467	157.7665	.7071	1.1180	7.5993	1.0000	336.9871	384.3435
Range	150.0000	-	1200.0000	550.0000	565.0000	2.0000	4.0000	26.0000	3.0000	1200.0000	1350.0000

Team Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	29.0625	-	618.9934	485.2874	292.0000	2.3125	27.9375	9.9375	2.3750	618.9934	646.0559
s.d. (s)	41.6862*	-	144.3245	71.9727	152.4293	.2421	.7262	6.5021	.7440	144.3245	178.9041
Range	115.0000	-	456.2002	250.0000	552.5000	.5000	2.5000	22.0000	20.0000	456.2002	531.2002

Corrected Values Variables	1	23	49
Mean $\bar{X}$	120.0000	115.0000	115.0000
s.d. (s)	-	32.7872	-
n	1	3	1

* s.d. $\sqrt{\bar{X}}$

** Only teams where both members had experience were considered in the calculations.

H BASES WITH AOU: R TEAMS: n = 45

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	2.8889	11.4133	420.4172	400.1951	329.5049	2.0444	26.9554	6.3776	2.0667	431.8306	434.7195
s.d.(s)	13.7643*	64.7296*	193.1842	160.6491	161.1343	.3625	1.7900	4.8134	1.5406	204.5330	206.1266
Range	80.0000	433.5998	794.0000	794.0000	695.0000	2.0000	7.0000	19.0000	7.0000	794.0000	794.0000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	79.9665	4.2044	725.9541	619.9524	407.8491	2.6667	27.9999	6.7111	3.4222	730.1585	806.1245
s.d.(s)	161.1689	19.7367	282.1677	265.7134	205.4777	.5164	2.1097	4.7732	3.0947	279.5081	350.2058
Range	1000.0000	109.2000	1222.9001	1360.0000	850.0000	2.0000	11.0000	17.0000	18.0000	1160.0000	1753.7001

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	39.4277	7.8089	573.1858	510.0742	368.6770	2.3556	27.4776	6.5444	2.7444	580.9946	620.4224
s.d.(s)	81.0921*	33.4795*	171.6736	153.1784	143.1394	.2910	1.3309	4.6593	1.8818	176.0774	218.6224
Range	500.0000	216.7999	699.0000	699.0000	650.0000	1.0000	6.0000	17.0000	9.0000	678.6500	1132.9000

Corrected Values Variables	1	2	23	24	49**
Mean ($\bar{X}$)	65.0000	256.8000	162.8095	94.6000	37.5000
s.d.(s)	21.2132	250.0330	208.8073*	20.6475	53.0330
n	2	2	21	2	2

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in the calculations.

H BASES WITH AOU: S TEAMS: n = 11

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean X	32.7273	-	595.7810	486.6995	384.0358	2.2727	26.8182	5.8182	2.9091	595.7810	628.5081
s.d. (s)	61.6576*	-	278.3325	146.5132	128.9455	4454	1.8002	4.6869	1.7297	278.3325	331.5278
Range	200.0000	-	1140.0000	527.1999	440.0000	1.0000	6.0000	17.0000	6.0000	1140.0000	1340.0000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean X	307.7271	442.5544	876.9175	685.2719	411.0088	2.8182	29.9091	5.9091	4.0909	1317.4719	1625.1989
s.d. (s)	411.5645*	727.4211*	330.5639	170.4979	189.1476	1.0000	2.9376	4.8139	2.3142	597.5852	974.2925
Range	1071.0999	1846.6999	1150.0000	603.0000	575.0000	1.0000	10.0000	19.0000	9.0000	2143.9997	3215.0996

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean X	170.2272	-	735.3488	585.9856	397.5222	2.5455	28.3636	5.8636	3.5000	956.6239	1126.8528
s.d. (s)	218.2311*	-	167.7591	143.2879	155.7177	1.3340	1.6807	4.7391	2.9703	370.4575	571.8977
Range	600.0000	-	645.0000	490.0998	507.5000	1.0000	6.0000	19.0000	6.5000	1245.0000	1845.0000

Corrected Values Variables	1	23	24	49**
Mean (X)	120.0000	564.1500	1289.0000	340.0000
s.d. (s)	72.1110	446.1144	702.3511	367.6955*
n	3	6	3	2

* s.d. > $\bar{x}$

** Only teams where both members had experience were considered in the calculations.

H BASES WITHOUT AOU: POPULATION = 39

Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	6.2821	4.7769	434.9563	395.3672	232.9536	2.0762	26.7179	8.3589	2.2564	439.7332	446.0148
s.d.(s)	24.4331*	29.4469*	159.3132	188.6292	205.3343	.4166	1.4499	5.5539	1.7934	164.1078	171.1031
Range	110.0000	186.2999	650.0000	750.0000	750.0000	2.0000	7.0000	28.0000	7.0000	650.0000	650.0000

Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	150.9743	28.2031	811.2593	538.6643	320.7939	2.6410	28.3332	8.0256	4.5641	839.4500	990.4326
s.d.(s)	284.1375*	173.8681*	440.3242	195.9234	304.7144	.5768	2.0683	5.4041	3.3189	460.6504	658.8203
Range	1500.0008	1100.0000	2200.0000	700.0000	950.0000	3.0000	10.0000	28.0000	17.0000	2200.0000	2850.0000

Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	78.6280	16.4910	623.1055	467.0161	276.8738	2.3589	27.5255	2.1923	3.4105	639.5964	718.2236
s.d.(s)	142.4917*	87.7891*	249.4469	140.6956	234.4016	.3747	1.4603	5.2092	2.0611	256.2170	353.0312
Range	750.0000	550.0000	1174.0000	650.0000	850.0000	2.0000	7.0000	28.0000	17.0000	1174.0000	1274.0000

Variables	1	2	23	24	49**	50**
Mean ($\bar{X}$)	81.6667	186.3	267.6164	1100.000	-	96.6667
s.d.(s)	49.075	-	342.3825*	-	-	66.0177
n	8	1	22	1	-	3

* s.d. > $\bar{X}$
 ** Only -eams where both members had experience were considered in the calculations.

H BASES WITHOUT AOU: E TEAMS: n = 11

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	2.2727	-	382.9995	361.2722	254.1817	2.0901	26.9090	9.7273	1.27273	382.9995	385.2722
s.d.(s)	7.1769	-	105.0922	118.4939	175.4694	.5143	1.4439	4.39156	.4454	105.0922	110.1888
Range	25.0000	-	413.0000	413.0000	591.0000	1.000	4.0000	17.0000	1.0000	413.0000	438.0000

Radar Navigator Variables	21	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	232.5454	100.0000	684.4539	489.4536	342.8174	2.6364	28.7272	9.0909	4.8182	724.4538	1016.9990
s.d.(s)	417.8713*	316.2279*	168.8877	157.2419	284.3171	.4811	2.2201	4.5817	4.5491	334.1143	735.3919
Range	1500.0000	1100.0000	526.0000	488.0000	850.0000	1.0000	8.0000	16.0000	17.0000	1270.0000	2770.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	117.4092	-	533.7266	425.3630	298.4995	2.3636	27.8182	9.0091	3.0454	583.7266	701.1355
s.d.(s)	208.4016	-	80.8683	108.1093	209.2875	.3083	1.6419	3.7648	2.3817	167.8303	366.5623
Range	750.0000	-	257.0000	296.5000	626.0000	1.0000	6.0000	13.0000	13.0000	659.5000	1372.5000

Corrected Values Variables	1**	23**	24**	49
Mean ($\bar{X}$)	25.0000	348.2857	1100.0000	25.0000
s.d.(s)	-	524.7402	-	0.0000
n	1	8	1	1

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in the calculations.

H BASES WITHOUT AGU: R TEAMS: n = 22

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	10.0000	8.4682	416.0627	389.4717	183.2817	2.0000	26.4999	7.4999	2.3182	424.5308	434.5308
s.d. (s)	31.6228*	38.8061*	152.6851	181.9334	177.6273	.3015	1.3066	6.0884	1.8681	162.3284	174.2409
Range	110.0000	186.2999	500.0000	700.0000	608.0000	2.0000	5.0000	28.0000	7.0000	500.0000	510.0000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	79.3181	-	755.9077	510.1799	253.6362	2.4999	27.8636	7.4091	4.1818	755.9077	835.2256
s.d. (s)	98.9294*	-	477.4722	172.5272	273.2444*	.5839	1.7138	5.7892	2.7409	477.4722	517.6201
Range	300.0000	-	2200.0000	650.0000	853.0000	1.5000	5.0000	78.0000	11.0000	2200.0000	2200.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	44.6590	-	585.9854	449.8259	218.4589	2.2500	27.1817	7.4545	3.5000	590.2195	634.6782
s.d. (s)	55.4342*	-	243.4799	119.6743	198.4511	.3286	1.1743	5.7739	1.8306	241.9399	263.8948
Range	155.0000	-	1176.0000	509.0000	654.0000	1.5000	4.0000	28.0000	7.0000	1176.0000	1176.0000

Corrected Values Variables	1**	2**	23**	49*
Mean $\bar{X}$	110.0000	186.0000	168.1250	132.5000
s.d. (s)	0.0000	-	62.7888	31.8198
n	2	1	8	2

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in the calculations.

H BASES WITHOUT AOU: S TEAMS: n = 6

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	-	-	599.4998	479.4995	376.1663	2.3333	27.1666	9.0000	3.8333	599.4998	599.4998
s.d.(s)	-	-	160.9478	168.4763	267.4549	1.4741	1.7719	4.7609	1.8634	160.9474	160.9474
Range	-	-	490.0000	510.0000	720.0000	1.0000	5.0000	14.0000	5.0000	490.0000	490.0000

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	264.1665	-	1246.6663	731.3330	526.6665	3.1667	29.3333	8.3333	5.5000	1246.6663	1510.8328
s.d.(s)	353.4404	-	376.4612	222.9857	348.9351	1.1777	2.4269	4.9888	2.1409	376.4612	697.8445
Range	1090.0000	-	1150.0000	550.0000	920.0000	1.0000	7.0000	14.0000	7.0000	1150.0000	2050.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	-	-	923.0830	606.4163	451.4165	2.7500	28.2499	8.6666	4.6666	923.0830	923.0830
s.d.(s)	-	-	255.7383	176.1445	297.6489	.3819	1.6522	4.8189	2.1370	255.7383	255.7383
Range	-	-	820.0000	525.0000	820.0000	1.0000	4.0000	14.000	4.5000	800.000	820.0000

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in the calculations.

G BASES WITH AOU: POPULATION: n = 54

Navigator's Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	14.2722	484.6155	0.0	423.1262	244.1955	2.2407	26.6850	5.7778	2.5376	484.6155	498.8872
s.d. (s)	36.0000	181.6849	-	206.6503	137.8289	.4733	1.4252	4.5956	1.3969	181.6849	198.7800
Range	200.0000	734.0999	-	940.0000	565.5000	2.0000	6.0000	20.0000	5.0000	734.0999	934.0999

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	236.4827	792.1099	75.4776	501.6252	269.7195	2.7592	28.4998	5.5370	3.8333	867.5881	1104.0728
s.d. (s)	760.8215	444.4675	290.8948	226.8194	140.4748	.5116	2.3771	4.6691	2.9953	522.2395	907.0642
Range	3800.0000	1770.0000	1500.0000	1000.0000	580.7998	2.0000	10.0000	2.0000	14.0000	2658.3997	4600.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	125.3774	638.3640	37.7388	462.3753	256.9597	2.4999	27.5924	2.5741	3.1252	676.1001	801.4785
s.d. (s)	379.1777	240.3774	144.0947	174.0808	121.0627	.3469	1.4023	.6966	1.6804	289.2134	479.9370
Range	1930.0000	987.5000	750.0000	845.0000	439.6600	1.5000	5.5000	2.0000	6.5000	1454.9497	2412.5000

Corrected Values Variables	1	3	23	25	49**	51**
Mean ($\bar{X}$)	77.0700	-	440.1034	1018.7500	343.2125	-
s.d. (s)	49.9372	-	1001.4691*	461.5982	647.1606*	-
n	10	-	29	4	8	-

* s.d. $> \bar{X}$

** Only teams where both members had experience were considered in the calculations.

G BASES WITH AOU: E TEAMS: n = 24

Navigator's Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	2.5792	413.9448	-	344.1411	190.5457	2.1250	26.7087	6.2083	2.3749	413.9448	416.5293
s.d. (s)	8.8133*	151.4149	-	183.0548	100.5286	.4389	1.4378	4.4251	1.4086	151.4149	155.3874
Range	38.2939	424.1001	-	740.0098	350.5000	2.0000	6.0000	13.0000	4.0000	424.1001	428.1098

Radar Navigators Variables	22	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	235.5466	879.4607	48.9916	501.5742	244.8540	2.9167	28.7499	6.2083	4.4583	928.4524	1224.0019
s.d. (s)	835.2810*	449.1877	234.9557*	187.0275	147.4378	.4910	2.8617	4.3778	2.8574	579.3679	1007.2334
Range	1700.0000	1650.0000	1157.7998	770.0000	590.8000	2.0000	10.0000	13.0000	9.0000	2538.3446	4490.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	147.0644	646.7024	24.4985	422.8572	217.6898	2.5208	27.7291	6.2083	3.4166	671.1982	820.2625
s.d. (s)	417.3374	232.9831	117.4779	151.4986	109.2802	.3379	1.5944	4.3723	1.6278	302.4775	525.2578
Range	1850.0000	913.3001	587.8990	665.0000	352.1501	1.5000	5.5000	13.0000	9.0000	1380.7498	2338.3001

Corrected Values Variables	1	23	25	49**
Mean ($\bar{X}$)	34.5000	461.6133	1175.0000	48.3333
s.d. (s)	9.3828	1055.7889*	-	32.2364
n	3	15	1	3

* s.d. $\sqrt{\bar{X}}$

** Only teams where both members had experience were considered in the calculations.

G BASES WITH AOU: R TEAMS: n = 21

Navigator	1	2	3	4	5	6	7	9	10	45	46
Variables	23.27142	493.4651	-	463.5891	269.2617	2.2381	26.6189	5.2381	2.4286	493.4651	516.7368
Mean X	49.3984*	191.8654	-	214.4371	151.4843	.4259	1.4317	5.1815	1.2936	191.8654	219.2081
s.d. (s)	200.0000	730.0000	-	830.0000	553.5000	1.0000	6.0000	20.0000	4.0000	730.0000	930.0000
Range											

Radar Navigator	23	24	25	26	27	28	29	31	32	47	48
Variables	53.3380	534.0176	119.0476	442.2705	277.7139	2.5238	28.1427	5.2381	2.4286	653.0649	706.4033
Mean X	61.8411*	233.4542	374.9526*	184.4956	134.3377	.4995	1.7544	5.1446	2.0136	353.6758	400.7559
s.d. (s)	200.0000	900.0000	1500.0000	600.0000	511.1111	1.0000	6.0000	20.0000	9.0000	1500.0000	1680.0000
Range											

Teams	49	50	51	52	53	54	55	57	58	63	64
Variables	38.3047	513.7412	59.5238	452.9269	273.4878	2.3809	27.3808	5.2381	2.4286	573.2649	611.5703
Mean X	46.6711*	134.1897	187.4764*	157.3709	121.2637	.3418	1.3276	5.1539	1.2556	225.3979	259.6650
s.d. (s)	190.0000	617.5000	750.0000	530.0000	428.3000	1.0000	6.0000	20.0000	12.0000	1042.5000	1233.5000
Range											

Corrected Values	1	23	25	49**
Variables	86.7500	96.8083	1250.0000	88.8300
Mean (X)	60.7300	51.6308	353.5534	60.1893
s.d. (s)	6	12	2	5.0000
n				

* s.d. > $\bar{X}$
 ** Only teams where both members had experience were considered in the calculations.

G BASES WITH AOU: 5 TEAMS: n = 9

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	24.4555	657.4326	-	539.3552	328.7886	2.5555	26.7778	5.8889	3.2222	652.4326	676.8882
s.d.(s)	36.2343	75.4879	-	144.4539	122.8027	.4969	1.2276	2.8846	1.3147	75.4879	75.2989
Range	100.0000	260.3999	-	450.0000	386.4001	1.0000	4.0000	9.0000	4.0000	260.3999	260.3999

Padar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	506.3215	1161.3992	44.4444	640.2661	317.3887	2.8889	28.6666	4.4444	5.4444	1201.8435	1712.1655
s.d.(s)	1174.3096	471.2771	125.7079	320.6650	109.8402	.3143	1.9442	3.5936	3.6549	432.9631	993.9587
Range	3800.0000	131.0000	400.0000	950.0000	315.0009	1.0000	7.0000	11.0000	13.0000	1300.0000	3590.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	265.3887	906.9158	22.2221	589.8103	323.0886	2.7222	27.7222	5.1666	4.3333	929.1379	1194.5266
s.d.(s)	595.2388	226.6321	62.8539	205.4637	112.5244	.2485	.8538	3.0459	2.0000	224.8579	499.3796
Range	1930.0000	686.9947	200.0000	700.0000	321.2595	.5000	3.0000	9.5000	12.0000	687.4999	1797.5000

Corrected Values Variables	1	23	25	49**
Mean ($\bar{X}$)	73.3333	911.3800	400.0000	1115.0000
s.d.(s)	23.0940	1625.2101*	-	1152.5841*
n	3	5	1	2

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in the calculations.

GENERAL STATISTICS FROM POPULATION USING MODEL G AIRCRAFT WITHOUT AOU (n = 113)

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	8.5841	489.1873	6.4690	396.5476	288.0459	2.1770	26.9469	6.6283	2.1593	493.6563	504.2405
s.d. (s)	25.5326*	205.0420	46.6781*	171.5964	195.9353	.4448	1.5027	8.7578	1.2787	205.6207	214.3563
Range	120.0000	890.0000	475.0000	736.0000	800.0000	2.0000	8.0000	62.0000	2.0000	890.0000	920.0000

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	47.9475	819.0132	25.1973	522.0059	357.6113	2.7080	28.4248	5.9292	3.3628	844.2107	892.1575
s.d. (s)	88.8156*	464.7036	129.8753*	226.4841	233.9254	.4567	2.0320	6.7900	2.1550	462.3555	487.9211
Range	510.0000	2330.0000	1000.0000	1187.0000	880.0000	1.0000	11.0000	36.0000	9.0000	2350.0000	2350.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	28.2659	654.0982	15.8332	450.2748	322.8283	2.4425	27.8359	6.2788	2.0266	669.9314	698.1974
s.d. (s)	48.4453*	264.7842	68.1029*	161.0811	191.5442	.3244	1.3051	7.2356	1.3905	264.1433	278.1433
Range	542.0000	2907.0000	1000.0000	1743.0000	1625.0000	3.0000	16.0000	72.0000	12.0000	2900.0000	2900.0000

Corrected Values (unequal n's)	1	3	9	23	25	31	49**	51**	57
Mean ($\bar{X}$)	67.2860	182.7500	7.2020	126.0000	474.5500	5.9300	69.9250	178.9000	6.6667
s.d. (s)	31.7750	169.6840	8.8580*	103.6940	318.7830	6.7999*	54.2900	152.4000	7.2670*
n	14	4	104	42	6	105	47	10	104

* s.d. > $\bar{X}$
 ** Only teams where both members had experience were considered in the calculations.

GENERAL STATISTICS DESCRIBING E TEAMS FROM BASES WITH MODEL G AIRCRAFT WITHOUT AOU (n = 30)

Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	1.5667	442.1731	0.0	370.2231	269.2764	2.1333	26.1333	7.0667	1.8667	442.1731	443.8398
s.d. (s)	9.1287	185.1529	-	168.2727	174.0064	.4342	1.9286	8.0855*	1.0743	185.1529	188.3563
Range	50.0000	650.2998	-	615.2998	725.0000	2.0000	7.0000	36.0000	4.0000	650.2998	665.2998

Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	41.1333	803.9097	6.6667	540.0764	363.7764	2.5333	28.1333	6.7333	3.1667	810.5764	851.7097
s.d. (s)	77.4322*	394.1431	36.5148*	234.7724	219.4114	.8374	2.0634	8.2617*	1.8770	386.0596	399.1624
Range	394.0000	1750.0000	200.0000	1025.0000	850.0000	1.0000	10.0000	36.0000	7.0000	1732.0000	1732.0000

Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	21.4000	623.0415	3.3335	435.1498	316.5265	2.3334	27.4334	6.9000	2.5150	626.3748	647.7748
s.d. (s)	38.5247*	222.3744	17.9506*	155.2250	165.9759	.3496	1.2721	8.0056*	1.1853	221.2521	228.3969
Range	394.0000	1781.0000	200.0000	1315.0000	1565.0000	3.0000	10.0000	72.0000	8.0000	1781.0000	1781.0000

Variables	1	9	23	25	31	49**	51**	57
Mean $\bar{X}$	50.0000	0.0	7.3100	102.8333	200.0000	6.9667	50.0000	0.0
s.d. (s)	-	-	8.1140*	94.2425	-	8.2970*	-	-
n	1	29	12	1	29	1	1	29

* s.d. > $\bar{X}$
 ** Only teams where both members had experience were considered in the calculations.

GENERAL STATISTICS DESCRIBING R TEAMS FROM BASES WITH MODEL G AIRCRAFT WITHOUT AOU (n = 62)

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Mean $\bar{X}$	8.6935*	442.4932	10.1774*	374.0288	262.6047	2.1290	26.8387	6.5665	1.9032	452.6707	461.3643
s.d.(s)	26.7162	186.3066	61.7157	150.5912	176.7641	.4240	1.4843	9.3819*	1.0971	187.6705	146.0726
Range	120.0000	890.0000	475.0000	710.0000	780.0000	2.0000	8.0000	62.0000	10.0000	890.0000	920.0000

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Mean $\bar{X}$	37.6145*	725.2786	17.2145*	473.2480	326.3674	2.7581	28.4677	5.3548	2.8871	742.4929	780.1074
s.d.(s)	71.3256	400.8997	96.3391	173.6890	224.1399	.4318	2.2156	5.5222*	1.7751	393.9895	421.7866
Range	350.0000	1750.0000	700.0000	663.0000	793.0000	1.0000	11.0000	24.0000	7.0000	1750.0000	1850.0000

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Mean $\bar{X}$	28.2659*	583.8935	0.0	423.6385	294.4861	2.4436	27.6532	5.9597	2.3952	597.5860	620.5000
s.d.(s)	38.5431	208.6449	-	121.0806	178.3042	.2993	1.3764	6.5699*	1.1385	198.6550	210.6208
Range	350.0000	1767.0000	-	920.0000	1208.0000	2.0000	16.0000	69.0000	9.0000	1760.0000	1800.0000

Corrected Values (unequal n's) Variables	1	3	9	23	25	31	49	51	57
Mean $\bar{X}$	77.0000	210.3333	7.6000	116.5500	355.7667	5.5890	72.1000	-	6.3000
s.d.(s)	33.4714	230.2614*	9.6536*	81.5073	320.0153	5.4900	37.1115	-	6.5370*
n	7	3	55	20	3	56	4	0	53

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in the calculations.

GENERAL STATISTICS DESCRIBING 5 TEAMS FROM BASES WITH MODEL G AIRCRAFT WITHOUT AOU (n = 21)

Navigators		1	2	3	4	5	6	7	9	10	45	46
Variables												
Mean $\bar{X}$		18.4290	694.2092	4.7619	500.6379	389.9712	2.3810	27.5714	6.1905	3.3333	698.9712	717.1140
s.d. (s)		34.4271*	160.2572	21.8217*	201.7038	249.6929	.4976	1.3256	8.1064*	1.4259	161.9150	171.9165
Range		100.0000	540.0000	100.0000	726.0000	790.0000	1.0000	4.0000	33.0000	6.0000	540.0000	590.0000

Radar Navigators		23	24	25	26	27	28	29	31	32	47	48
Variables												
Mean $\bar{X}$		88.1905	1117.3333	75.2381	640.1429	441.0476	2.8095	28.7143	6.4762	5.0476	1192.5713	1280.7617
s.d. (s)		133.6515*	610.6123	246.7307*	301.1279	270.2131	.4024	1.4881	8.0661*	2.7473	590.5803	599.6726
Range		520.0000	2360.0000	1000.0000	1097.0000	800.0000	1.0000	6.0000	33.0000	9.0000	2003.0000	1999.0000

Teams		49	50	51	52	53	54	55	57	58	63	64
Variables												
Mean $\bar{X}$		53.1665	905.7714	40.0000	570.3904	415.5094	2.5953	28.1429	6.3334	4.1905	945.7714	998.9380
s.d. (s)		73.2743*	314.3267	120.1189*	213.9765	230.6098	.2936	.9915	7.8654*	1.4788	307.2717	314.6035
Range		542.0000	2380.0000	1000.0000	1603.0000	1420.0000	2.0000	8.0000	66.0000	3.0000	2380.0000	2380.0000

Corrected Values (unequal n's)		1	3	9	23	25	31	49**	51**	57
Variables										
Mean ($\bar{X}$)		63.5000	100.0000	6.5000	154.3333	790.0000	6.8000	145.3000	-	6.6500
s.d. (s)		35.8427	-	8.1920*	144.4003	226.9848	8.1340*	98.1731	-	8.1340*
n		6	1	20	12	2	20	5	0	20

* s.d. > $\bar{X}$

** Only teams where both members had experience were considered in these calculations.

GENERAL STATISTICS FROM SAC NAVIGATOR-RADAR NAVIGATOR QUESTIONNAIRES, N = 270

Variables	1	2	3	4	5	6	7	8	9	10	45	46
Maximum X	520.0000	1030.0000	1300.0000	1000.0000	800.0000	3.0000	31.0000	62.0000	10.0000	1300.0000	1500.0000	1500.0000
Minimum X	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	23.0000	0.0000	1.0000	140.0000	140.0000	140.0000
Slew	6.9849	.3714	1.2751	.6005	.7187	.7642	.1205	3.0205	1.6255	.5524	.8187	.8187

Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	3800.0000	2500.0000	2550.0000	1380.0000	950.0000	4.0000	36.0000	36.0000	18.0000	2858.3997	4800.0000
Minimum X	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	25.0000	0.0000	0.0000	150.0000	150.0000
Slew	7.3954	1.0222	1.3732	.6966	.5190	-.7220	1.0863	1.7879	2.0096	1.4884	2.3947

Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	1930.0000	1700.0000	1485.0000	1046.5000	850.0000	3.5000	33.0000	36.0000	15.0000	1712.4497	2670.0000
Minimum X	0.0000	0.0000	0.0000	130.0000	0.0000	1.5000	24.5000	0.0000	1.0000	242.0998	242.0998
Slew	7.1902	.4724	.9655	.5265	.3473	.1751	.1021	1.9071	1.3195	1.3502	2.1266

GENERAL STATISTICS OF NAVIGATOR-RADAR NAVIGATOR TEAMS FROM H BASES, N = 103

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	200.0000	433.5999	1300.0000	800.0000	795.0000	3.0000	31.0000	30.0000	8.0000	1300.0000	1500.0000
Minimum X	0.0000	0.0000	156.0000	0.0000	0.0000	1.0000	24.0000	1.0000	1.0000	156.0000	156.0000
Slew	4.1593	8.0117	1.0863	.3038	.5170	.7292	.4276	1.4259	1.7135	.9984	1.2772

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	1500.0000	1846.6999	2559.0000	1360.0000	950.0000	4.0000	36.0000	30.0000	18.0000	2550.0000	3615.0998
Minimum X	0.0000	0.0000	137.0999	0.0000	0.0000	1.0000	25.0000	1.0000	0.0000	200.0000	200.0000
Slew	3.2917	4.9932	1.4549	.4543	.3189	-.7047	1.2199	1.2517	2.2468	1.6046	2.1126

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	750.0000	923.3499	1485.0000	886.0000	850.0000	3.5000	32.0000	30.0000	20.0000	1550.0000	2150.0000
Minimum X	0.0000	0.0000	187.4999	187.4999	0.0000	1.5000	25.0000	1.0000	2.0000	242.0999	242.0999
Slew	3.2255	4.8279	1.2094	.9979	.1242	.3137	.3495	1.3606	1.9746	1.5129	2.0893

GENERAL STATISTICS OF NAVIGATOR-RADAR NAVIGATOR TEAMS FROM G BASES, N =

Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	520.0000	1030.0000	580.0000	1000.0000	800.0000	3.0000	31.0000	62.0000	10.0000	1030.0000	1300.0000
Minimum X	0.0000	140.0000	0.0000	60.0000	20.0000	1.0000	23.0000	0.0000	1.0000	140.0000	140.0000
Skew	6.8586	.3143	8.6230	.7386	.8529	.7118	.2577	3.3488	1.5782	.2734	.5515

Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	3800.0000	2500.0000	1500.0000	1337.0000	900.0000	4.0000	36.0000	36.0000	15.0000	2858.3997	4800.0000
Minimum X	0.0000	150.0000	0.0000	150.0000	20.0000	2.0000	23.0000	0.0000	1.0000	150.0000	150.0000
Skew	7.3616	1.2808	5.6663	.8747	.6446	-.6765	1.0284	2.0440	1.5113	1.4222	2.5438

Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	1930.0000	1700.0000	750.0000	1046.5000	832.5000	3.5000	33.0000	36.0000	17.0000	1712.4497	2870.0000
Minimum X	0.0000	246.5000	0.0000	130.0000	20.0000	1.5000	24.5000	0.0000	2.0000	250.0000	250.0000
Skew	7.1889	1.1567	5.1353	.6557	.4929	.0702	.2540	2.1590	1.5442	1.2591	2.1646

GENERAL STATISTICS OF SAC NAVIGATOR-RADAR NAVIGATOR E TEAMS, N = 74

Navigators		1	2	3	4	5	6	7	9	10	45	46
Variables												
Maximum X	120.0000	800.0000	875.0000	800.0999	765.0000	31.0000	31.0000	31.0000	36.0000	5.0000	875.0000	875.0000
Minimum X	0.0000	0.0000	0.0000	60.0000	22.0000	1.0000	24.0000	24.0000	0.0000	1.0000	149.7000	149.7000
Skew	5.8754	.0087	1.6359	.6322	1.2446	.6354	.3805	.3805	1.8095	1.2332	.2685	.3649

Radar Navigators		23	24	25	26	27	28	29	31	32	47	48
Variables												
Maximum X	3700.0000	2000.0000	1400.0000	1200.0000	900.0000	4.0000	35.0000	35.0000	36.0000	18.0000	2858.3997	4800.0000
Minimum X	0.0000	0.0000	0.0000	175.0000	0.0000	1.0000	25.0000	25.0000	0.0000	1.0000	200.0000	200.0000
Skew	5.4240	.6211	1.6055	.6211	.8257	-.5435	1.3813	1.3813	1.8326	2.2389	1.2256	2.8165

Teams		49	50	51	52	53	54	55	57	58	63	64
Variables												
Maximum X	1850.0000	1245.0000	950.0000	832.5000	832.5000	3.5000	32.0000	32.0000	36.0000	19.0000	1712.4497	2670.0000
Minimum X	0.0000	0.0000	0.0000	130.0000	25.0000	1.5000	25.0000	25.0000	0.0000	2.0000	289.5000	289.5000
Skew	5.4109	.0464	1.2429	.5037	.8428	.2549	.4937	.4937	1.8508	1.6199	1.7870	2.7427

GENERAL STATISTICS OF NAVIGATOR-RADAR NAVIGATOR S TEAMS, N = 47

Navigator's Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	520.0000	900.0000	1300.0000	900.0000	795.0000	3.0000	31.0000	33.0000	10.0000	1300.0000	1500.0000
Minimum X	0.0000	0.0000	0.0000	150.0000	30.0000	2.0000	25.0000	0.0000	1.0000	160.0000	180.0000
Skew	4.3957	-.2021	1.1872	.2007	.0953	.4812	.6029	2.0549	1.2059	.2903	.8461

Radial Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	3500.0000	2500.0000	2000.0000	1337.0000	950.0000	4.0000	36.0000	33.0000	15.0000	2543.9998	4300.0000
Minimum X	0.0000	0.0000	0.0000	240.0000	20.0000	2.0000	26.0000	0.0000	1.0000	450.0000	450.0000
Skew	4.7776	.4111	1.0390	.3048	.0492	-1.1077	1.2664	2.0118	1.3697	.7104	1.4738

Teams Variables	40	50	51	52	53	54	55	57	58	63	64
Maximum X	1930.0000	1700.0000	1425.0000	1046.5000	850.0000	3.5000	31.5000	33.0000	17.0000	1700.0000	2487.5000
Minimum X	0.0000	0.0000	0.0000	245.0000	30.0000	2.0000	25.5000	0.0000	2.0000	305.0000	305.0000
Skew	4.5013	-.0063	.8158	.0479	-.0480	.2209	.7220	2.0978	1.2878	.6526	1.2995

GENERAL STATISTICS OF SAC NAVIGATOR-RADAR NAVIGATOR R TEAMS, N = 149

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	200.0000	1030.0000	950.0000	1000.0000	800.0000	3.0000	31.0000	62.0000	8.0000	1030.0000	1100.0000
Minimum X	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	23.0000	0.0000	1.0000	140.0000	140.0000
Sum	3.4233	.6247	.9875	.7395	.6911	.8248	.2903	3.6298	1.8171	.6872	.7171

Radar Navigators Variables	23	24	25	26	27	29	31	32	47	48
Maximum X	1000.0000	1900.0000	2550.0000	1360.0000	950.0000	4.0000	36.0000	30.0000	2550.0000	2550.0000
Minimum X	0.0000	0.0000	0.0000	0.0000	0.0000	1.0000	25.0000	0.0000	0.0000	150.0000
Sum	4.7842	1.2564	1.3049	.7136	.5018	.6657	.9250	1.4917	2.2881	1.5211

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	500.0000	1130.0000	1485.0000	886.0000	750.0000	3.0000	33.0000	34.5000	20.0000	587.7966	621.3318
Minimum X	0.0000	0.0000	0.0000	187.4899	0.0000	1.5000	24.5000	0.0000	2.0000	204.1181	229.6191
Sum	4.0251	.4636	.7559	.3431	.1098	.07323	.4371	1.8515	1.5440	1242.9000	1247.9000

BASES WITH MODEL H AIRCRAFT WITH AOU, n = 64

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	200.0000	433.5999	1300.0000	800.0000	795.0000	3.0000	31.0000	20.0000	8.0000	1300.0000	1500.0000
Minimum X	0.0000	0.0000	156.0000	156.0000	75.0000	1.0000	24.0000	1.0000	1.0000	125.0000	156.0000
Skew	4.0009	7.4614	1.1896	.4041	.7339	.5666	.5797	-1.1111	.8624	1.0866	1.4066

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	1071.0999	1846.7000	1450.0000	1360.0000	950.0000	4.0000	36.0000	28.0000	18.0000	2543.9998	3615.0996
Minimum X	0.0000	0.0000	137.1000	137.1000	75.0000	2.0000	25.0000	1.0000	0.0000	200.0000	246.3000
Skew	3.0628	4.3447	.0919	.2651	.4647	-4.846	1.3034	-1.1651	1.2856	1.5612	2.3423

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	1200.0000	1846.7000	1900.0000	1772.0000	1500.0000	6.0000	63.0000	48.0000	20.0000	3100.0000	4300.0000
Minimum X	0.0000	0.0000	374.9998	374.9998	175.0000	4.0000	50.0000	2.0000	2.0000	484.2000	484.2000
Skew	3.0954	4.2003	-.1226	.3173	.1739	.1642	.5682	-1.4019	1.1428	1.4230	2.1763

BASES WITH H MODEL AIRCRAFT WITH AOU: E CREWS, n = 8

Navigator Variable	1	2	3	4	5	6	7	9	10	45	46
Maximum X	120.0000	-	875.0000	775.0000	640.0000	3.0000	29.0000	20.0000	5.0000	875.0000	875.0000
Minimum X	0.0000	-	282.0000	282.0000	75.0000	2.0000	26.0000	2.0000	1.0000	282.0000	282.0000
Skew	2.2678	-	.3696	.5991	.9314	2.2678	.0821	.6651	.4896	.3696	.3865

Radar Navigator Variable	23	24	25	26	27	28	29	31	32	47	48
Maximum X	150.0000	-	1400.0000	750.0000	640.0000	1.0000	30.0000	4.0000	3.0000	1400.0000	1550.0000
Minimum X	0.0000	-	200.0000	200.0000	75.0000	1.0000	26.0000	1.0000	1.0000	200.0000	200.0000
Skew	.7623	-	.7848	-.0696	.4851	-1.0607	-1.0733	1.3329	.7500	.7848	.8445

Teams Variable	49	50	51	52	53	54	55	57	58	63	64
Maximum X	230.0000	-	1900.0000	1300.0000	1280.0000	5.0000	58.0000	48.0000	7.0000	1900.0000	2050.0000
Minimum X	0.0000	-	987.5999	800.0000	175.0000	4.0000	53.0000	4.0000	2.0000	987.5999	987.5999
Skew	1.0552	-	1.3508	1.2027	.9926	-.5164	-.5304	1.0669	.6653	1.3508	1.0925

BASES WITH H MODEL AIRCRAFT WITH AOU: R CREWS, n = 45

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	80.0000	433.5999	950.0000	800.0000	795.0000	3.0000	31.0000	18.0000	8.0000	930.0000	950.0000
Minimum X	0.0000	0.0000	156.0000	156.0000	100.0000	1.0000	24.0000	1.0000	1.0000	156.0000	156.0000
Skew	4.7494	6.1870	1.0342	.7014	.9504	.5643	.5133	.7694	2.1127	.9385	.8881

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	1000.0000	109.2000	1360.0000	1360.0000	950.0000	4.0000	36.0000	18.0000	18.0000	1360.0000	2000.0000
Minimum X	0.0000	0.0000	137.1000	137.1000	100.0000	2.0000	25.0000	1.0000	0.0000	200.0000	246.3000
Skew	4.3832	4.5950	-.1276	.3378	.5469	-.2162	1.3546	.6868	2.5530	-.0567	.6249

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	1000.0000	433.5999	1772.0000	1772.0000	1500.0000	6.0000	62.0000	36.0000	20.0000	1841.4995	2750.0000
Minimum X	0.0000	0.0000	374.9998	374.9998	200.0000	4.0000	50.0000	2.0000	2.0000	484.7000	484.2000
Skew	4.2558	5.4941	-.1175	.4429	.1940	.1461	.4888	.7316	2.3453	.0303	.7392

BASES WITH MODEL H AIRCRAFT WITHOUT AOU, n = 39

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	110.0000	186.3000	850.0000	750.0000	750.0000	3.0000	31.0000	30.0000	8.0000	950.0000	850.0000
Minimum X	0.0000	0.0000	200.0000	0.0000	0.0000	1.0000	24.0000	2.0000	1.0000	200.0000	200.0000
Skew	3.9276	6.0022	.4344	.1719	.8068	.5534	.2922	1.6219	1.6929	.4074	.3903

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	1500.0000	1100.0000	2550.0000	950.0000	950.0000	4.0000	35.0000	30.0000	18.0000	2550.0000	950.0000
Minimum X	0.0000	0.0000	350.0000	250.0000	0.0000	1.0000	25.0000	2.0000	1.0000	350.0000	250.0000
Skew	3.4031	6.0022	1.9635	.6932	.5043	-.3656	1.1536	1.8137	1.9625	1.7176	1.8689

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	1500.0000	1100.0000	2970.0000	1700.0000	1700.0000	7.0000	64.0000	60.0000	19.0000	2970.0000	3850.0000
Minimum X	0.0000	0.0000	618.0000	400.0000	0.0000	3.0000	50.0000	4.0000	2.0000	618.0000	618.0000
Skew	3.3126	5.7657	1.8786	.5462	.5190	.5099	.8040	1.8695	1.8727	1.6685	1.8852

BASES WITH MODEL H AIRCRAFT WITHOUT AOU: E CREWS, n = 11

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	25.0000	-	613.0000	613.0000	613.0000	3.0000	29.0000	20.0000	2.0000	613.0000	613.0000
Minimum X	0.0000	-	200.0000	200.0000	200.0000	1.0000	25.0000	3.0000	1.0000	200.0000	200.0000
Skew	2.8461	-	.4598	.5153	.4882	.1325	-.0493	.7885	1.0205	.4598	.6369

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	1500.0000	1100.0000	956.0000	738.0000	850.0000	3.0000	35.0000	18.0000	18.0000	1700.0000	3200.0000
Minimum X	0.0000	0.0000	430.0000	250.0000	0.0000	2.0000	27.0000	2.0000	1.0000	430.0000	430.0000
Skew	2.4762	2.8461	.3505	.1518	.2174	-.5671	1.9315	.2023	2.1228	1.6749	2.2845

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	1500.0000	1100.0000	1295.0000	1190.0000	1302.0000	6.0000	64.0000	32.0000	19.0000	2100.0000	3600.0000
Minimum X	0.0000	0.0000	781.0000	597.0000	50.0000	4.0000	52.0000	6.0000	2.0000	781.0000	855.0000
Skew	2.4825	2.8461	-.2745	.2292	.1484	.2494	1.3256	.0797	1.8214	1.6961	2.3527

BASES WITH H MODEL AIRCRAFT WITHOUT AOU: R CREWS, n = 22

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	110.0000	186.3000	700.0000	700.0000	608.0000	3.0000	29.0000	30.0000	8.0000	700.0000	710.0000
Minimum X	0.0000	0.0000	200.0000	0.0000	0.0000	1.0000	24.0000	2.0000	1.0000	200.0000	200.0000
Skew	2.8461	4.3643	.0593	.0011	1.0050	.0002	-.6356	2.2084	1.8757	.1101	.1653

Kadar Navigators Variables	21	24	25	26	27	28	29	31	32	47	48
Maximum X	300.0000	-	2550.0000	900.0000	853.0000	3.0000	31.0000	30.0000	12.0000	2550.0000	2550.0000
Minimum X	0.0000	-	350.0000	250.0000	0.0000	1.0000	25.0000	2.0000	1.0000	350.0000	350.0000
Skew	.8356	-	2.3250	1.0299	.8686	-.6854	.1039	2.6019	1.1738	2.3250	1.5835

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	310.0000	186.3000	2270.0000	1418.0000	1308.0000	6.0000	58.0000	60.0000	16.0000	2970.0000	2970.0000
Minimum X	0.0000	0.0000	618.0000	430.0000	0.0000	3.0000	50.0000	4.0000	2.0000	2352.0000	2352.0000
Skew	.7641	4.3644	2.2314	-.1173	.6209	.0004	-.2123	2.5697	1.5447	2.2291	1.4991

BASES WITH H MODEL AIRCRAFT WITHOUT AOU: S CREWS, n = 6

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	-	-	850.0000	750.0000	750.0000	3.0000	31.0000	16.0000	6.0000	850.0000	850.0000
Minimum X	-	-	360.0000	240.0000	30.0000	2.0000	26.0000	2.0000	1.0000	360.0000	360.0000
Skew	-	-	.1706	.1746	.0165	.7070	1.5419	.1390	-.2204	.1706	.1706

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	1000.0000	-	2000.0000	950.0000	950.0000	4.0000	34.0000	16.0000	9.0000	2000.0000	3000.0000
Minimum X	0.0000	-	850.0000	400.0000	30.0000	3.0000	27.0000	2.0000	2.0000	850.0000	950.0000
Skew	1.3381	-	1.0105	-.6022	-.4437	1.7878	.8652	.4382	.0510	1.0105	1.4524

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	1000.0000	-	2850.0000	1700.0000	1700.0000	7.0000	61.0000	32.0000	15.0000	2850.0000	3850.0000
Minimum X	0.0000	-	1210.0000	750.0000	60.0000	5.0000	53.0000	4.0000	3.0000	1210.0000	1210.0000
Skew	1.3381	-	.8841	-.0092	-.2934	1.1263	.4989	.3299	-.1312	.8841	1.3747

BASES WITH G MODEL AIRCRAFT WITH AOU, n = 34

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	200.0000	900.0000	-	1000.0000	650.0000	3.0000	30.0000	21.0000	6.0000	900.0000	1100.0000
Minimum X	0.0000	165.9000	-	60.0000	84.5000	1.0000	24.0000	1.0000	1.0000	165.9000	165.9000
Skew	3.1951	.11369	-	.5469	.9422	.6601	.5508	-1.3740	1.2674	.1369	.3719

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	3800.0000	1970.0000	1500.0000	1200.0000	650.0000	4.0000	35.0000	21.0000	15.0000	2858.3997	4800.0000
Minimum X	0.0000	200.0000	0.0000	200.0000	69.2000	2.0000	25.0000	1.0000	1.0000	200.0000	200.0000
Skew	4.0815	1.0268	3.8885	.8091	.6852	-.3169	1.1863	-1.3939	1.2879	1.4675	2.3163

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	3860.0000	2490.0000	1500.0000	1950.0000	1050.0000	7.0000	62.0000	42.0000	17.0000	3424.8997	5340.0000
Minimum X	0.0000	515.0000	0.0000	260.0000	172.7000	4.0000	49.0000	2.0000	2.0000	515.0000	515.0000
Skew	4.0525	1.0499	3.8885	.4052	.3503	.3343	.4987	-1.5801	1.2774	1.3494	2.1047

BASES WITH G MODEL AIRCRAFT WITH AGU: E CREWS, n = 24

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	38.3000	690.0000	-	800.1000	435.0000	3.0000	30.0000	14.0000	5.0000	690.0000	692.9998
Minimum X	0.0000	524.1000	-	60.0000	84.5000	1.0000	24.0000	1.0000	1.0000	165.9000	165.9000
Skew	3.3154	-.0634	-	.6337	1.0585	.6006	.4198	.6314	.6582	-.0634	.0098

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	3700.0000	1970.0000	1175.8000	900.0000	650.0000	1.0000	35.0000	14.0000	10.0000	2858.3997	4800.0000
Minimum X	0.0000	320.0000	0.0000	200.0000	69.2000	2.0000	25.0000	1.0000	1.0000	320.0000	320.0000
Skew	3.3158	.9969	4.5873	.2374	1.0381	-.1839	1.0937	.6195	.6916	1.7598	2.1043

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	3700.0000	2490.0000	1175.8000	1590.0000	877.0000	7.0000	62.0000	28.0000	15.0000	3424.8997	5340.0000
Minimum X	0.0000	663.3999	0.0000	260.0000	172.7000	4.0000	51.0000	2.0000	3.0000	663.3999	663.3999
Skew	3.3142	1.0893	4.5873	.3209	.4766	.7569	.4500	.7065	.6813	1.9125	2.1052

BASES WITH G MODEL AIRCRAFT WITH AGU: R CREWS, n = 21

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	200.0000	900.0000	-	1000.0000	650.0000	3.0000	30.0000	21.0000	5.0000	900.0000	1100.0000
Minimum X	0.0000	170.0000	-	170.0000	96.5000	2.0000	24.0000	1.0000	1.0000	170.0000	170.0000
Skew	2.3866	.5683	-	.8822	1.0735	1.2297	.8239	1.7964	.3555	.5683	.8118

Padar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	200.0000	1100.000	1500.0000	800.0000	600.0000	31.0000	31.0000	21.0000	10.0000	1700.0000	1880.0000
Minimum X	0.0000	200.0000	0.0000	200.0000	88.9000	2.0000	25.0000	1.0000	1.0000	200.0000	200.0000
Skew	.8782	.5569	2.9676	.3197	.7619	-.0957	-.1758	1.8289	2.4491	1.3561	1.3885

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	380.0000	1750.0000	1500.0000	1450.0000	1050.0000	6.0000	61.0000	42.0000	14.0000	2600.0000	2980.0000
Minimum X	0.0000	515.0000	0.0000	390.0000	193.4000	4.0000	49.0000	2.0000	2.0000	515.0000	515.0000
Skew	1.5990	.9259	2.9676	-.0045	.3473	.3406	.3423	1.8207	1.7961	1.6691	1.8963

BASES WITH G MODEL AIRCRAFT WITH AOU: S CREWS, n = 9

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	100.0000	780.4000	-	750.0000	500.0000	3.0000	29.0000	12.0000	6.0000	780.4000	780.4000
Minimum X	0.0000	520.0000	-	300.0000	123.4000	2.0000	25.0000	3.0000	2.0000	520.0000	520.0000
Skew	1.0109	.0958	-	-.3689	-.5028	-.2239	.0507	.8331	.7334	.0938	-.6788

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	3800.0000	1800.0000	400.0000	1200.0000	450.0000	1.0000	34.0000	12.0000	15.0000	1800.0000	4300.0000
Minimum X	0.0000	500.0000	0.0000	250.0000	134.1000	2.0000	27.0000	1.0000	2.0000	500.0000	710.0000
Skew	2.4700	.0992	2.4749	.4695	-.4386	-2.4766	2.1885	.8721	1.8409	-.1866	1.7629

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	3867.0000	2488.9000	400.0000	1950.0000	900.0000	6.0000	59.0000	24.0000	17.0000	2488.9000	4975.0000
Minimum X	0.0000	1115.0000	0.0000	550.0000	257.5000	5.0000	53.0000	5.0000	5.0000	1115.0000	1380.0000
Skew	2.1755	.1211	2.4749	.4695	-.5674	.2208	.6213	1.1317	1.9487	-.1536	1.7213

BASES WITH G MODEL AIRCRAFT WITHOUT AOU, n = 113

Navigators		1	2	3	4	5	6	7	9	10	43	46
Variables												
Maximum X	120.0000	1030.0000	475.0000	876.0000	820.0000	20.0000	3.0000	31.0000	62.0000	7.0000	1030.0000	1060.0000
Minimum X	0.0000	140.0000	0.0000	140.0000	20.0000	20.0000	1.0000	23.0000	0.0000	1.0000	140.0000	140.0000
Skew	3.0329	.3592	9.2219	.7605	.7727	.7397	.4997	.31688	1.1665	.3190	.3422	

Radar Navigators		23	24	25	26	27	28	29	31	32	47	48
Variables												
Maximum X	520.0000	2500.0000	1000.0000	1337.0000	900.0000	2.0000	2.0000	36.0000	36.0000	10.0000	2500.0000	2500.0000
Minimum X	0.0000	150.0000	0.0000	150.0000	20.0000	2.0000	2.0000	25.0000	0.0000	1.0000	150.0000	150.0000
Skew	2.8048	1.3548	5.8493	.9022	.4026	-.9152	.9793	2.0513	1.1212	1.3643	1.1687	

Teams		49	50	51	52	53	54	55	57	58	63	64
Variables												
Maximum X	542.0000	3400.0000	1000.0000	2093.0000	1665.0000	6.0000	6.0000	66.0000	72.0000	14.0000	3400.0000	3400.0000
Minimum X	0.0000	493.0000	0.0000	350.0000	40.0000	3.0000	3.0000	50.0000	0.0000	2.0000	500.0000	500.0000
Skew	2.5188	1.1826	5.1833	.8024	.3146	-.0889	.8786	2.0930	1.2162	1.1938	1.0175	

BASES WITH G MODEL AIRCRAFT WITHOUT AOU: E CREWS, n = 30

Navigator Variables	1	2	3	4	5	6	7	9	10	43	46
Maximum X	50.0000	800.0000	-	765.0000	765.0000	3.0000	31.0000	36.0000	5.0000	800.0000	815.0000
Minimum X	0.0000	149.7000	-	149.7000	46.0000	1.0000	24.0000	0.0000	1.0000	149.7000	149.7000
Skew	5.1495	.1989	-	.7276	1.2504	.7466	.6287	2.0397	1.6255	.1985	.2574

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	394.0000	2000.0000	200.0000	1200.0000	900.0000	3.0000	35.0000	36.0000	8.0000	2000.0000	2000.0000
Minimum X	0.0600	250.0000	0.0000	175.0000	50.0000	2.0000	25.0000	0.0000	1.0000	268.0000	268.0000
Skew	3.3059	1.1501	5.1995	.7262	.7678	-1.1342	1.1763	2.0653	.9123	1.2478	.9482

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	394.0000	2360.0000	200.0000	1665.0000	1665.0000	6.0000	60.0000	72.0000	10.0000	2360.0000	2360.0000
Minimum X	0.0000	579.0000	0.0000	350.0000	100.0000	3.0000	50.0000	0.0000	2.0000	579.0000	579.0000
Skew	3.1618	.7744	5.1995	.7017	.8991	-.0229	.1613	2.1000	1.1679	.7468	.5792

BASES WITH C MODEL AIRCRAFT WITHOUT AOU: R CREWS, n = 62

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	120.0000	1030.0000	475.0000	45.0000	45.0000	3.0000	31.0000	3.0000	5.0000	1030.0000	1060.0000
Minimum X	0.0000	140.0000	0.0000	1.0000	1.0000	1.0000	23.0000	2.0000	1.0000	140.0000	140.0000
Skew	3.0863	.7323	7.1143			.2448	.3221	1.0184	2.5108	.6432	.6371

Radar Navigators Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	350.0000	1900.0000	700.0000	211.0000	211.0000	3.0000	36.0000	24.0000	8.0000	1900.0000	2000.0000
Minimum X	0.0000	150.0000	0.0000	150.0000	150.0000	2.0000	25.0000	0.0000	1.0000	150.0000	150.0000
Skew	2.5107	1.2884	6.2344	2.2444	2.2444	-1.2398	1.0496	3.4481	1.6853	1.3017	1.1401

Teams Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	350.0000	2260.0000	700.0000	1350.0000	1240.0000	4.0000	66.0000	69.0000	11.0000	2260.0000	2300.0000
Minimum X	0.0000	493.0000	0.0000	430.0000	40.0000	4.0000	50.0000	6.0000	2.0000	500.0000	500.0000
Skew	1.9789	.6275	4.7564	2.5098	1.6544	.6427	1.1309	1.4037	1.4495	.7071	.5371

BASES WITH G MODEL AIRCRAFT WITHOUT AGU: S CREWS, n = 21

Navigator Variables	1	2	3	4	5	6	7	9	10	45	46
Maximum X	100.0000	900.0000	100.0000	876.0000	820.0000	3.0000	30.0000	33.0000	7.0000	900.0000	950.0000
Minimum X	0.0000	360.0000	0.0000	150.0000	30.0000	2.0000	26.0000	0.0000	1.0000	360.0000	360.0000
Skew	1.6359	-1.3842	4.2485	.3517	.0717	.4903	.3959	2.0691	.7695	-.4163	-.4539

Radar Navigator Variables	23	24	25	26	27	28	29	31	32	47	48
Maximum X	520.0000	2500.0000	1000.0000	1337.0000	820.0000	1.0000	32.0000	33.0000	10.0000	2500.0000	2500.0000
Minimum X	0.0000	200.0000	0.0000	240.0000	20.0000	2.0000	26.0000	0.0000	1.0000	497.0000	501.0000
Skew	1.9995	.8801	3.1087	.6302	-.1157	-1.5779	.0616	1.9989	.4829	.8485	.6949

Team Variables	49	50	51	52	53	54	55	57	58	63	64
Maximum X	542.0000	3400.0000	1000.0000	2093.0000	1500.0000	6.0000	61.0000	66.0000	14.0000	3400.0000	3400.0000
Minimum X	0.0000	1020.0000	0.0000	490.0000	80.0000	4.0000	53.0000	0.0000	4.0000	1020.0000	1020.0000
Skew	1.6397	1.0739	3.0720	.2054	-.2778	-.0712	.7573	2.0595	.9624	.9270	.6408

APPENDIX F

ANALYSIS OF VARIANCE

The purpose of this analysis was to determine whether R, E, and S teams were significantly different from one another in terms of average crew flying hours, and to determine whether the four subpopulations defined by model type (G vs. H) and AOU equipage (equipped vs. not equipped) were alike or significantly different. The subpopulations are factor B in Tables 9 and 11. In Table 11, (1) denotes a G model base without AOU, (2) denotes an H model base without AOU, (3) denotes a G model base with AOU, and (4) denotes an H model base with AOU. Table 10 shows the contrast comparisons for team types, factor T in Table 9.

Because there are unequal numbers of cases in each cell of the analysis, appropriate adjustments must be made, as explained, for example, in Snedecor and Cochran (1967). The approach taken here was to employ regression analysis and then summarize the results in an "adjusted" form as an ANOVA table.

The results of this analysis show that all contrasts between team types are statistically significant. The R, E, and S groupings are sufficiently unlike in their average flying hours that they may be treated as separate strata.

The results of base contrasts indicate that the G bases without AOU are very similar to H bases without AOU. However, for some reason, G bases with AOU have a significantly larger number of average flying hours than any other subgroup. The analysis does support the assertion that a sample from the sub-population of non-AOU G bases will be representative of the overall crew force (only a sample from AOU equipped G bases would not be).

TABLE 9
ANALYSIS OF VARIANCE FOR BASES (B) AND CREW TYPE (T)
BASES: AOU G vs H & Non-AOU G vs H.
Crew Types: R, E, and S.

Source	SS	df	MS	F
B:adj	70117821.6	3	23372607.2	1252 **
T:adj	67536149.53	2	33768074.77	6143 **
BxT:adj	134692068.6	6	22448671.1	4083 **
Within Cell	1418172.7	257	5496.7934	

** .01

TABLE 10
MULTIPLE COMPARISONS
FOR CREW TYPE DIFFERENCES

	T (Crews)		
	R	E	S
R	62.9010	704.3068	1093.8706
E	82.4058*	471.9696*	
S		389.5638*	

.05

TABLE 11
MULTIPLE COMPARISONS
FOR BASE DIFFERENCES
(3 - AOU Equipped G Model Bases)

	Bases (B)			
	1	2	3	4
1	798.4449	797.0601	875.4531	755.8138
2		1.3848	77.0082*	42.6311
3			78.3930*	41.2463
4				119.6393*

* .05

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