

## Appendix B FDD Projects

The following tables are taken from the *SEL Cost and Schedule Estimation Study Report* [Condon 93]. They are included here to provide an overview of the basic characteristics of the many FDD projects studied by the SEL over the years. Table B-2 summarizes system size and reuse rates for the same projects.

Project	Type	Development Language	Duration Period <sup>1</sup>	Weeks	Technical and Management <sup>6</sup> Hours
PASA	AGSS	F	05/76 — 09/77	69	15760
ISEEB	AGSS	F	10/76 — 09/77	50	15262
AEM	AGSS	F	02/77 — 03/78	57	12588
SEASAT	AGSS	F	04/77 — 04/78	54	14508
ISEEC	AGSS	F	08/77 — 05/78	38	5792
SMM	AGSS	F	04/78 — 10/79	76	14371
MAGSAT	AGSS	F	06/78 — 08/79	62	15122
FOXPRO	AGSS	F	02/79 — 10/79	36	2521
DEA	AGSS	F	09/79 — 06/81	89	19475
DEB	AGSS	F	09/79 — 05/81	83	17997
DESIM	TS	F	09/79 — 10/80	56	4466
ERBS	AGSS	F	05/82 — 04/84	97	49476
DERBY	DS	F	07/82 — 11/83	72	18352
GROSS	DS	F	12/84 — 10/87	145	15334
GRODY	DS	A	09/85 — 10/88	160	23244
COBEDS	DS	F	12/84 — 01/87	105	12005
ASP	AGSS	F	01/85 — 09/86	87	17057
GROAGSS	AGSS	F	08/85 — 03/89	188	54755
GROSIM	TS	F	08/85 — 08/87	100	11463
COBSIM	TS	F	01/86 — 08/87	82	6106
COBEAGSS	AGSS	F	06/86 — 09/88	116	49931
GOADA	DS	A	06/87 — 04/90	149	28056
GOFOR	DS	F	06/87 — 09/89	119	12804
GOESAGSS	AGSS	F	08/87 — 11/89	115	37806
GOESIM	TS	A	09/87 — 07/89	99	13658
UARSAGSS	AGSS <sup>2</sup>	F	11/87 — 09/90	147	89514
ACME	AGSS <sup>2</sup>	F	01/88 — 09/90	137	7965
UARS_2	AGSS <sup>2</sup>	F	N/A	N/A	97479
UARSDSIM	DS	F	01/88 — 06/90	128	17976
UARSTELS	TS	A	02/88 — 12/89	94	11526
EUVEAGSS	AGSS	F	10/88 — 09/90	102	21658
EUVE_2 <sup>3</sup>	AGSS	F	N/A	N/A	21658
EUVETELS	TS	A	10/88 — 05/90	83	4727
EUVEDSIM	DS	A	10/88 — 09/90	121 <sup>4</sup>	20775 <sup>4</sup>
SAMPEXTS	TS	A	03/90 — 03/91	48	2516
SAMPEX	AGSS <sup>5</sup>	F	03/90 — 11/91	85	4598
SAMPEXTP	AGSS <sup>5</sup>	F	03/90 — 11/91	87	6772
SAMPEX_2	AGSS <sup>5</sup>	F	N/A	N/A	11370
POWITS	TS	A	03/90 — 05/92	111	11695

Abbreviations: A AGSS Ada Attitude Ground Support System DS F Dynamics simulator FORTRAN simulator TS Telemetry simulator

<sup>1</sup> Design phase through acceptance test phase.

<sup>2</sup> The AGSS for the UARS satellite was developed as two projects. One project, containing the majority of the AGSS code and functionality, was called simply UARSAGSS and was developed by CSC. The other project, containing two utilities (CFADS and STARID), was called ACME and was developed in-house by GSFC. When referring to the total size or effort of the two combined projects, this study uses the name UARS\_2.

<sup>3</sup> The EUVE AGSS was developed as a single project, and the EUVEAGSS account in the SEL database includes all hours spent on this AGSS. In recording the lines of code in the EUVEAGSS account, however, the SEL database did not include the ACME lines of code, all of which were borrowed from the ACME project and reused verbatim in the EUVE AGSS. When referring to the size or productivity of the total EUVE AGSS, this study uses the name EUVE\_2. The values for effort and schedule duration do not vary between EUVE AGSS and EUVE\_2.

<sup>4</sup> Duration adjusted by +15% and Effort adjusted by +10% because EUVEDSIM did not have an acceptance test phase. These values are consistent with those of the Ada Size Study Report.

<sup>5</sup> The AGSS for the SAMPEX satellite was developed as two projects. The telemetry processor part, called SAMPEXTP, was developed in-house by GSFC. The other project, containing the majority of the AGSS code and functionality, was called simply SAMPEX and was developed by CSC. When referring to the total size or effort of the two combined projects this study uses the name SAMPEX\_2.

<sup>6</sup> Includes technical staff and technical management hours for preproject through cleanup phases. Does not include support staff-hours (project management, librarians, secretaries, technical publications).

**Table B-1: Projects Studied**

Project	Newly Written	Extensively Modified	Slightly Modified	Reused Verbatim
PAS	84729	0	20041	7098
ISEEB	43955	0	3506	7776
AEM	45345	0	4673	893
SEASAT	49316	0	4252	21825
ISEEC	20075	0	6727	48618
SMM	76883	0	5652	2834
MAGSAT	61950	0	14297	13266
FOXPRO	5354	0	1323	2449
DEA	45004	0	9705	12616
DEB	44644	0	8606	13016
DESIM	14873	0	0	385
ERBS	137739	0	5767	15635
DERBY	37137	0	3901	4549
GROSS	33196	3493	8574	6441
GRODY	123935	1143	3037	146
COBEDS	26986	0	7363	2556
ASP	70951	0	0	10483
GROAGSS	194169	9982	18133	14109
GROSIM	31775	0	4294	2881
COBSIM	45825	1342	1156	4494
COBEAGSS	141084	16017	13647	7934
GOADA	109807	12496	41750	7049
GOFOR	22175	2867	6671	5330
GOESAGSS	106834	6377	9779	5869
GOESIM	59783	5784	15078	11450
UARSAGSS	260382	9340	21536	11868
ACME	34902	0	0	0
UARS_2	295284	9340	21536	11868
UARSDSIM	63861	17476	20710	4399
UARSTELS	38327	6114	12163	11544
EUVEAGSS	41552	13597	14844	179016
EUVE_2	41552	13597	14844	213918
EUVETELS	2161	371	5573	58591
EUVEDSIM	20859	36248	87415	39495
SAMPEXTS	0	3301	6120	52026
SAMPEX	10590	1631	1282	141006
SAMPEXTP	15899	1920	1777	36
SAMPEX_2	26489	3551	3059	141042
POWITS	12974	7980	20878	26275

**Table B-2: Detailed Line-of-Code Data**



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