2/25/99

Overview: Alaska Science

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Alaska Science and Technology Foundation

Mission—Build an Entrepreneurial Alaska Economy Through the Development &Application of Science & Technology (AS37.17)

Challenge—

- **One in seven jobs in goods producing sectors vs. one in three nationally;**
- **Need to enlarge and diversify goods producing base by expanding exports or replacing imports. ASTF has "grow your own economy" focus through science and technology;**
- **Use market-based incentives to share technical risk with private sector and scientists to work with industry on applied projects. 20% Knowledge Projects, 80% Technology**

I. Process Resources to Add Value

Salmon Based Final Products
$7.3M annual sales

New Surimi Process
$150K grant leads to$1.3M Kodiak investment

Salmon Pin Bone Removal Technology ($1M ASTF, $1M match)
prototype built, beta test this summer

Shellfish ($70K ASTF, $200K match)
Kachemak Bay Oyster Seed Project

II. Replace Imports

Fresh Cut Vegetables ($470K ASTF, $2.1M match)
Anchorage plant, Valley produce

Rural Housing Manufacturing ($160K, $432K)
Pt. McKenzie Plant Planned

Petro Star Desulfurization Project ($400K ASTF, $850K match)
Avoid imports to replace AK Fuel

Sawmill Assistance Program ($200K ASTF, $200K-INC)
9 Mills have WWPA Graded Lumber. Imports are 70-90 MMBF/year

Tyonek Mill ($320K ASTF, $547K match)
New process to produce bridge materials, second plant Nenana

III. Science for Alaska Benefit

Total Dissolved Solids Project to develop simple test for TDS , Phase I $20K
Project of Producers Council, ADF&G, ADEC. Phase II FY99

Remote Sensing Demonstration for Mining ($400K ASTF, $300K match)
Integrate radar, topographic, and geotechnical data on high resolution maps for enhanced exploration (Ft. Knox, other mining, Aeromap)

2/25/99
ATTACHMENT IV

Anchorage Seismology Project ($600K ASTF, $400K match)

Anchorage Muni and local engineers oversee UAF work to produce microzone maps to show local areas where buildings are over or under designed.

IV. Technology Infrastructure for Growth

Risk Capital--AK Growth Capital BIDCO

Added $1.4M in equity in 1998, now capitalized $7M

Alaska Investor Network

April Launch of InvestNet bring together entrepreneurs and investors to fund deals

K-12 Internet Project

90% schools wired, about half by NetDay Volunteers

K-12 Science Projects

50 projects for less than $5 K equipment

Summary

Budget

FY98 111 Projects $13.6M ASTF (multi-year) + $65M Matching

Includes $5M Kodiak Launch Complex in FY 98

Low Rank Coal Water Fuel Project (UAF) $4.2M in FY99

1995-present flat Operating Budget $1.28M

FY99 Grants Budget $7.7M plus $4M UAF Coal Project

Operations as % of Total Expenditures dropped 32% in FY 95 to 8% FY98.

FY99 Legislative Earmarks of ASTF Earnings $2.6M UA and $500K AADC

Earnings only estimated.

Performance

PAST

Projects always had performance measures and payments tied to benchmark performance. New task is to sum those project measures to overall measures.
Board has annually adopted goals and Director evaluation
Grant Guidelines and projects on Internet at www.astf.org

1999 McDowell Survey on performance measures

70% return of grantee surveys, only direct impacts counted
Measure Economic Impacts early in business development
130 direct jobs/year last 3 years vs 100 jobs/year average 1993-1997
$12.7M cumulative sales
84% not undertake project unless ASTF, 36% would not be in business
Need Better Measures on Knowledge Projects

Performance Measures: Summary Table

Performance Measure 1
ASTF Grant-Related Employment

Cumulative Total Employment	99
1993-97 Average*	130
1995-97 Average*	

*Based on year of grant award. Includes year-round and seasonal jobs. Includes only direct employment; multiplier effects are not included.

Performance Measure 2
Grant-Related Gross Business Sales

Total Current Annual Sales	$12.7 million
1993-97 Annual Average	$1.6 million
1995-97 Annual Average	$1.9 million

Performance Measure 3
Percentage and Number of Grantees in Business Because of ASTF Grant

	Percentage	Number
Cumulative Total	na	37
1993-97 Average	34%	6
1995-97 Average	37%	8

Performance Measure 4
New/Improved Product, Process and Service Development (Percentage and Number of Applicable Grants Resulting in New/Improved Products, Processes and Services)

	Percent of Grants		Number of Grants		
	Average	Average	Total	Average	Average
Improved Production Process	53%	53%	28	4	6
Added Value to Existing Product or Service	61%	63%	39	6	8
Development of New Process	62%	68%	41	7	10
Development of New Product	71%	75%	49	7	10
Development of New Service	50%	62%	32	5	7

Performance Measure 5
Percentage and Number of Grants Increasing Basic Scientific and Technical Knowledge

	Percentage	Number
Cumulative Total	na	77
1993-97 Average*	84%	12
1995-97 Average*	84%	15

*Based on year of grant award.

Performance Measure 6
Percentage of Knowledge Projects Resulting in Development of New Processes or Services, or Reduced Costs

	Percentage	Number
Cumulative Total	na	28
1993-97 Average*	60%	4
1995-97 Average*	71%	5

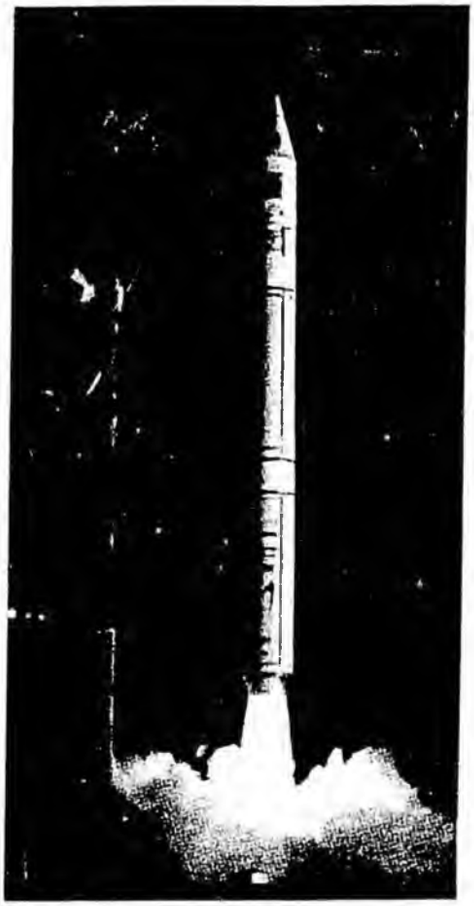
*Based on year of grant award.

Source: McDowell Group

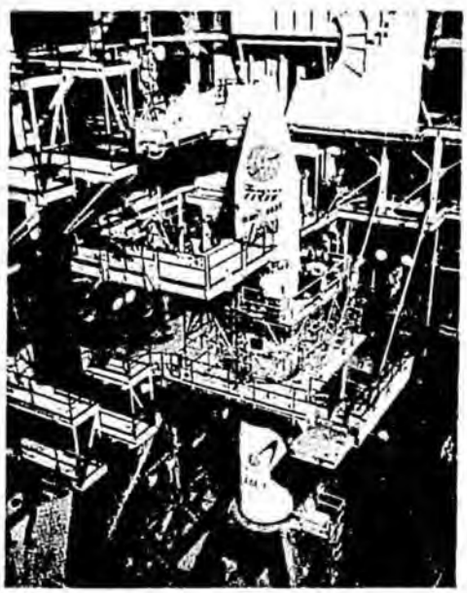
Athena Launch Vehicle Family

LOCKHEED MARTIN

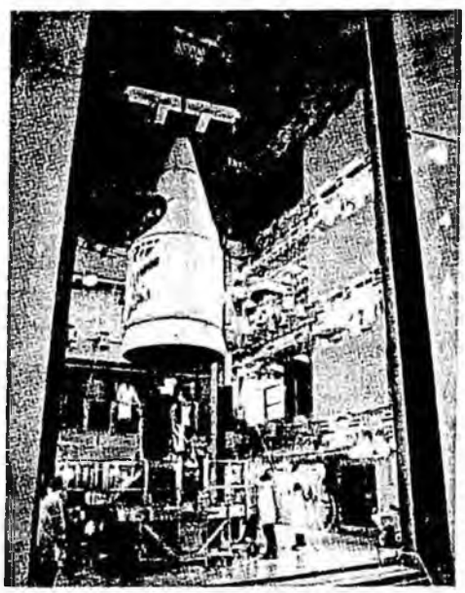
An Athena I successfully launched NASA's Lewis mission on August 22, 1997, from Vandenberg Air Force Base, CA.



The maiden flight of the Athena II successfully boosted NASA's Lunar Prospector to the moon on January 6, 1998 from Launch Complex 46 at Cape Canaveral Air Station, Fla.



"Stack-and-shoot" pad processing allows higher launch rates and lower cost than conventional liquid-propulsion systems.



Multiple payloads may be processed concurrently through the Integrated Processing Facility at Vandenberg AFB.

Athena is a family of expendable launch vehicles designed to provide small payloads with reliable, cost-effective access to space. We provide a complete launch service to government and commercial customers alike, placing small payloads into low-earth, geosynchronous transfer and interplanetary orbits.

The Athena program is based on over 40 years of successful space launch vehicle and missile system experience. Lockheed Martin has launched more than 1,100 vehicles, produced over 2,900 propulsive systems, and has established launch sites and range interfaces.

Under development since 1993, Athena is a commercial partnership among four companies: Lockheed Martin Astronautics (LMA), that provides the overall systems integration and launch services; Thiokol, builder of the Castor 120® solid rocket motor; Pratt & Whitney, builder of the Orbus® 21D solid rocket motor; and Primex Technologies, who supplies the hydrazine attitude control system.

The Athena family offers:

- Complete launch services
- Large range of performance options
- Spacious payload accommodations
- High design margins
- Moderate interface environments
- Hardware-in-the-loop testing
- Full-range orbit inclination capabilities
- Minimum on-pad requirements
- Over 35 years of launch vehicle and launch integration experience

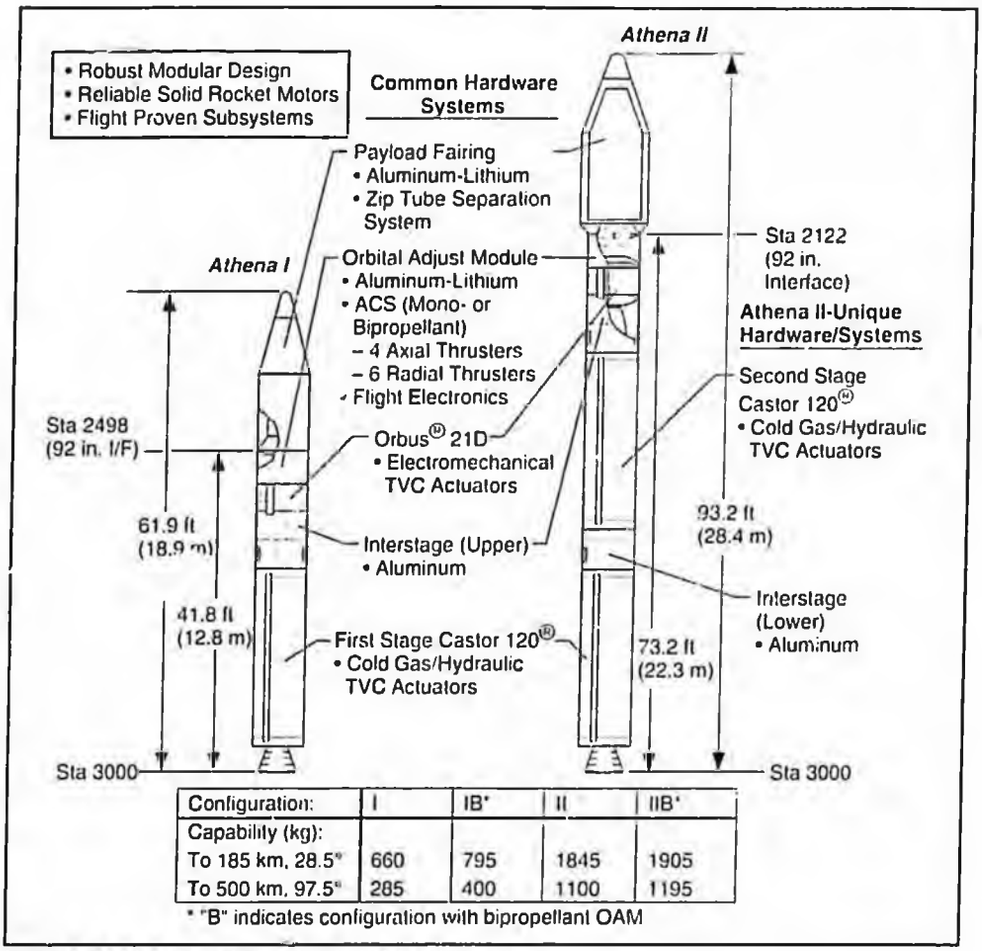
Athenas are launched from Vandenberg AFB, CA, at Space Launch Complex 6, providing orbit inclinations of 70° to 120°; and from Cape Canaveral Air Station, FL, at Launch Complex 46, providing inclinations of 28.5° to 57°. A third launch site is under consideration to more efficiently meet midinclination requirements.

Specifications

LOCKHEED MARTIN

The Athena family consists of two operational launch vehicle configurations: Athena I, that uses a 92"-diameter payload fairing; and Athena II, that can use either the 92"-or a 120"-diameter fairing. The Orbit Adjust Module (OAM) contains an attitude control system that is available in its standard monopropellant configuration or as a bipropellant stage for enhanced performance. The Athena III, planned to meet the future market requirements, will have approximately twice the performance of the Athena II and will accommodate a fairing up to 130" in diameter.

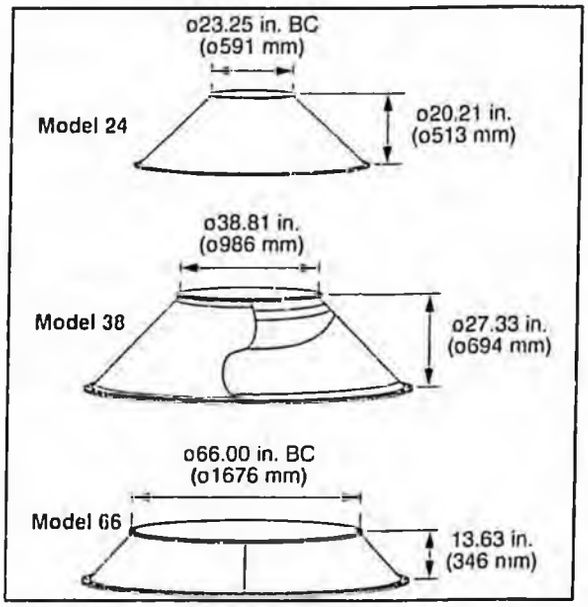
Both the range of available performance and large fairing volumes reduce mission risk by allowing for spacecraft growth. The Athena vehicles can also accommodate secondary payloads secured to the side of, or within, the payload adapter.



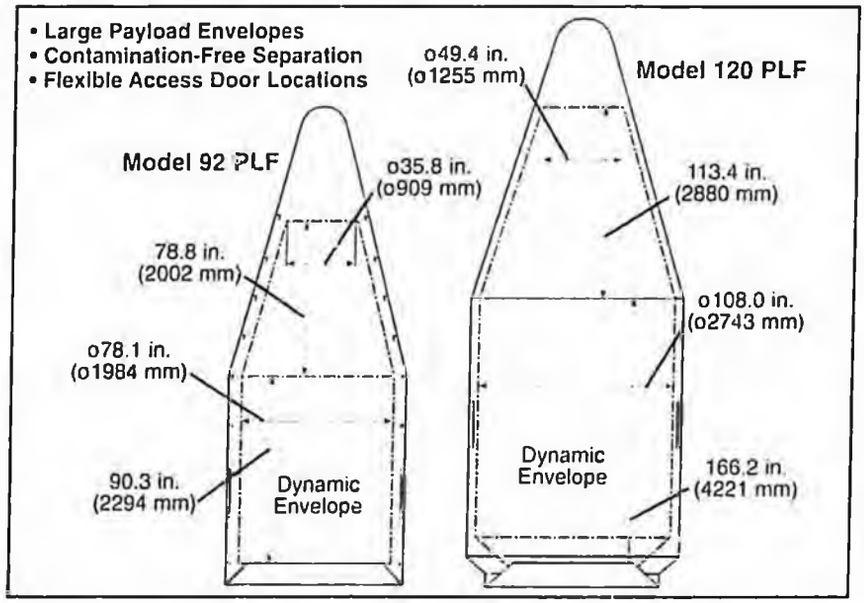
Configuration:	I	IB*	II	IIB*
Capability (kg):				
To 185 km, 28.5°	660	795	1845	1905
To 500 km, 97.5°	285	400	1100	1195

* "B" indicates configuration with bipropellant OAM

Launch Vehicle Configurations and Performance



Payload Adapter Models (Models 37 and 47 not shown)



Payload Fairing Options

Athena Launch Vehicle Family
Business Development Office
P.O. Box 179, MS DC-1155
Denver, Colorado 80201
Phone (303) 971-1229 or (303) 971-5565
Fax (303) 977-6177

THE FOLLOWING DOCUMENT HAS NOT BEEN FILMED BUT IS AVAILABLE IN THE ORIGINAL FILE.

Kodiak Launch Complex
Confidential Draft of 9/30/98
-$4,904,469

Capital Project Cash Flows	Starting Balance	Actual Funding Feb-98	ct-00	Nov-00	Dec-(	Feb-02	Mar-02	Apr-02	May-02	Jun-02	FY-02 Total	
Revenue												
ASTF Grant	5,000,000										0	5,000,000
Federal Funding	18,110,000										0	18,110,000
NASA PPF Grant	4,899,958		0	0							0	4,899,958
Federal Funding for Tower	0	0				0	0	0	0	0	0	4,800,000
State Appropriation	0										0	0
AADC Corp. Receipts (Bond Proceeds)	0										0	0
AADC Corp. Receipts (Interest Earnings)	0										229,536	1,587,050
Non-Cash/In-Kind Receipts	0										0	6,500,000
Total CPCF Gross Revenue	28,009,958	0	0	0							229,536	40,897,008
EXPENDITURES												
Project Owner Admin		91,453									0	221,551
Rise Alaska		83,671									0	536,428
BRPH		53,830									0	814,804
Project Infrastructure Support (FF&E)		0										0
PTI Communications (Temporary)		0										99,231
Phase I AK Contract		206,080									0	2,360,545
Phase II Red Sam Contract		0									0	5,634,280
OIS Contract		0	0	0							0	574,354
Total		435,234				0	0	0	0	0	0	10,247,093
Contingency												
BRPH												0
Phase I AK Contract		0									0	488,183
Phase II Red Sam Contract		0	0	0							0	0
Total Contingency		0				0	0	0	0	0	0	488,183
PROJECTIONS												
			,000	5,000	5,000							
Project Owner Administration			0	0	0	0	0	0	0	0	0	843,695
Project Infrastructure Support (FF&E)			0	0	0	0	0	0	0	0	0	1,400,000
RISE Contract			0	0	0	0	0	0	0	0	0	541,675
BRPH			0	0	0	0	0	0	0	0	0	830,663
PTI Communications (Temporary)			0	0	0	0	0	0	0	0	0	145,324
PTI Communications (Microwave)			0	0	0	0	0	0	0	0	0	500,000
Working Capital			,000	5,000	5,000	0	0	0	0	0	0	1,000,000
Total AADC/RISE Projections	0		0			0	0	0	0	0	0	5,081,357
BRPH Projections			0	0	0							
Phase I AK Contract			0	0	0	0	0	0	0	0	0	106,026
Phase II Red Sam Contract			0	0	0	0	0	0	0	0	0	10,955,720
Phase III Tower Contract			0	0	0	0	0	0	0	0	0	7,947,700
OIS Contract			0	0	0	0	0	0	0	0	0	582,310
Total BRPH Projections	0					0	0	0	0	0	0	20,191,755
Contingency Projections			0	0	0							
Phase I AK Contract			0	0	0	0	0	0	0	0	0	165,237
Phase II Red Sam Contract			0	0	0	0	0	0	0	0	0	709,983
Phase III Tower Contract			0	0	0	0	0	0	0	0	0	0
OIS Contract			0	0	0	0	0	0	0	0	0	0
Total Category O	0					0	0	0	0	0	0	875,220
Non-Cash Expenditures			0	0	0							
Range Safety System (In-kind value)	0					0	0	0	0	0	0	6,500,000
Total CPCF Expenses	0	435,23	,000	5,000	5,000	0	0	0	0	0	0	43,383,589
9% Contingency on Remaining Exp.			450	450	450	0	0	0	0	0	0	2,417,889
Net Capital Project Cash Flow	28,009,958	-435,23	450	-5,450	-5,450	0	0	0	0	0	229,536	
Total Capital Project Cash Balance (Cum.)		27,574,72	581	-4,887,031	-4,872,481	-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469		
Phase III Tower Encumbrance Schedule	0											
Encumbrances			0	0	0							
Project Owner Administration	0		0	0	0	0	0	0	0	0		
Project Infrastructure Support (FF&E)	0		0	0	0	0	0	0	0	0		
RISE Contract	981,300	897,42	0	0	0	0	0	0	0	0		
BRPH	1,465,467	1,411,63	0	0	0	0	0	0	0	0		
PTI Communications (Microwave)	0		0	0	0	0	0	0	0	0		
Phase I AK Contract	2,241,443	2,735,36	0	0	0	0	0	0	0	0		
Phase II Red Sam Contract	18,190,000	18,190,000	0	0	0	0	0	0	0	0		
Phase III Tower Contract	0		0	0	0	0	0	0	0	0		
OIS Contract	1,156,564	1,156,56	581	-4,887,031	-4,872,481	0	0	0	0	0		
TOTAL UNENCUMBERED CASH	5,275,184	5,183,73				-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469		

Kodiak Launch Complex
Confidential Draft of 9/30/98
-$4,904,469

Capital Project Cash Flows

	Starting Balance	Feb-98	Mar-98	Apr-98	May-98	Jun-98	FY-98 TOTAL	Jul-98	Aug-98	Sep-98	Oct-98
		Actual Funding									
Revenue											
ASTF Grant	5,000,000						5,000,000				
Federal Funding	18,110,000						18,110,000				
NASA PPF Grant	4,899,958						4,899,958				
Federal Funding for Tower	0	0	0	0	0	0	0	0	0	0	0
State Appropriation	0						0				
AADC Corp. Receipts (Bond Proceeds)	0						0				
AADC Corp. Receipts (Interest Earnings)	0						0				
Non-Cash/In-Kind Receipts	0						0				
Total CPCF Gross Revenue	28,009,958	0	0	0	0	0	28,009,958	0	0	0	0
EXPENDITURES											
Project Owner Admin		91,453	16,546	8,037	1,644	6,331	124,011	83,306	37	12,261	12,633
Rise Alaska		83,871	29,336	20,208	56,393	65,670	264,478	76,123	49,365	33,633	24,174
BRPH		53,830	0	166,890	167,319	84,577	472,617	90,989	0		166,209
Project Infrastructure Support (FF&E)		0	0	0	0	0	0	0	0	0	0
PTI Communications (Temporary)		0	0	0	0	0	0	0	0	0	0
Phase I AK Contract		206,080	313,791	497,671	222,650	400,278	1,640,469	158,466	261,748		194,950
Phase II Red Sam Contract		0	0	0	0	0	0	821,250	0	2,627,460	2,165,570
OIS Contract		0	0	0	0	523,334	523,334	50,920	0	0	0
Total		435,234	359,673	731,808	448,006	1,080,190	3,024,905	1,281,074	331,150	2,673,554	2,565,536
Contingency											
BRPH							0				
Phase I AK Contract		0	0	0	0	46,438	46,438	188,966	214,877		22,578
Phase II Red Sam Contract		0	0	0	0	0	0	0	0		
Total Contingency		0	0	0	0	46,438	46,438	188,966	214,877	0	22,578
PROJECTIONS											
Project Owner Administration							0				
Project Infrastructure Support (FF&E)							0				
RISE Contract							0				
BRPH							0				
PTI Communications (Temporary)							0				
PTI Communications (Microwave)							0				
Working Capital							0				
Total AADC/RISE Projections	0	0	0	0	0	0	0	0	0	0	0
BRPH Projections											
Phase I AK Contract							0				
Phase II Red Sam Contract							0				
Phase III Tower Contract							0				
OIS Contract							0				
Total BRPH Projections	0	0	0	0	0	0	0	0	0	0	0
Contingency Projections											
Phase I AK Contract											
Phase II Red Sam Contract											
Phase III Tower Contract											
OIS Contract											
Total Category G	0	0	0	0	0	0	0	0	0	0	0
Non-Cash Expenditures											
Range Safety System (In-kind value)	0	0	0	0	0	0	0	0	0	0	0
Total CPCF Expenses	0	435,234	359,673	701,808	448,006	1,126,628	3,071,346	1,450,060	546,027	2,673,554	2,808,114
9% Contingency on Remaining Exp.											
Net Capital Project Cash Flow	28,009,958	-435,234	-359,673	-701,808	-448,006	-1,126,628	-3,071,346	-1,450,060	-546,027	-2,673,554	-2,808,114
Total Capital Project Cash Balance (Cum.)		27,574,724	27,215,051	26,513,243	26,065,239	24,938,612		23,488,551	22,942,524	20,268,970	17,460,856
Phase III Tower Encumbrance Schedule	0	0	0	0	0	0	0	0	0	0	0
Encumbrances											
Project Owner Administration	0	0	0	0	0	0		0	0	0	0
Project Infrastructure Support (FF&E)	0	0	0	0	0	0		0	0	0	0
RISE Contract	981,300	897,429	866,092	836,885	782,492	716,822		640,839	591,334	557,501	510,130
BRPH	1,465,467	1,411,637	1,411,637	1,244,746	1,077,427	992,850		901,861	901,861	901,861	733,652
PTI Communications (Microwave)	0	0	0	0	0	0		0	0	0	0
Phase I AK Contract	2,941,443	2,735,363	2,421,573	1,923,902	1,701,252	1,254,537		907,085	410,439	410,439	203,407
Phase II Red Sam Contract	18,190,000	18,190,000	18,190,000	18,190,000	18,190,000	18,190,000		15,371,911	15,371,911	12,761,367	10,579,733
Phase III Tower Contract	0	0	0	0	0	0		0	0	0	0
OIS Contract	1,156,564	1,156,564	1,156,564	1,156,564	1,156,564	633,230		582,310	582,310	582,310	582,310
TOTAL UNENCUMBERED CASH	5,275,184	5,163,731	5,167,185	5,159,148	5,157,504	5,151,173		5,084,707	5,084,670	5,054,892	5,051,625

	Nov-98	Dec-98	Jan-99	Feb-99	Mar-99	Apr-99	May-99
		Projected Capital Funding					
Revenue							
ASTF Grant							
Federal Funding							
NASA PPF Grant							
Federal Funding for Tower	0	0	4,800,000	0	0	0	0
State Appropriation							
AADC Corp. Receipts (Bond Proceeds)							
AADC Corp. Receipts (Interest Earnings)			1,155,045	56,847	50,885	47,613	43,654
Non-Cash/In-Kind Receipts						6,500,000	
Total CPCF Gross Revenue	0	0	5,955,045	56,847	50,885	6,547,613	43,654
EXPENDITURES							
Project Owner Admin	9,303						
Rise Alaska	98,455						
BRPH	82,989						
Project Infrastructure Support (FF&E)	0	0					
PTI Communications (Temporary)	99,231						
Phase I AK Contract	90,692						
Phase II Red Sam Contract	0			0			0
OIS Contract	0						
Total	370,670	0	0	0	0	0	0
Contingency							
BRPH							
Phase I AK Contract	15,284						
Phase II Red Sam Contract				0			0
Total Contingency	15,284	0	0	0	0	0	0
PROJECTIONS							
Project Owner Administration		10,000	29,348	15,000	5,000	5,000	5,000
Project Infrastructure Support (FF&E)		0	0	0	0	0	0
RISE Contract		4,447	46,451	46,451	46,451	46,451	46,451
BRPH		69,178	82,989	82,989	82,989	82,989	82,989
PTI Communications (Temporary)		14,532	14,532	14,532	14,532	14,532	14,532
PTI Communications (Microwave)		0	0	0	0	0	0
Working Capital		0	0	0	0	0	0
Total AADC/RISE Projections	0	118,157	173,321	148,973	148,973	148,973	148,973
BRPH Projections							
Phase I AK Contract		106,026	0	0	0	0	0
Phase II Red Sam Contract		4,978,577	1,417,849	1,230,849	412,549	303,849	129,049
Phase III Tower Contract		335,000	705,000	750,000	650,000	700,000	2,507,700
OIS Contract		0	44,800	88,435	60,075	369,000	20,000
Total BRPH Projections	0	5,419,603	2,167,649	2,069,284	1,122,624	1,372,849	2,656,749
Contingency Projections							
Phase I AK Contract		185,237	0	0	0	0	0
Phase II Red Sam Contract		59,904	23,636	0	0	0	0
Phase III Tower Contract		0	0	0	0	0	0
OIS Contract		0	0	0	0	0	0
Total Category G	0	245,141	23,636	0	0	0	0
Non-Cash Expenditures							
Range Safety System (In-kind value)	0	0	0	0	0	6,500,000	0
Total CPCF Expenses	386,154	5,782,901	2,364,606	2,228,057	1,271,597	8,021,622	2,805,722
9% Contingency on Remaining Exp.			212,615	200,525	114,444	721,946	252,515
Net Capital Project Cash Flow	-386,154	-5,782,901	3,377,825	-2,371,735	-1,335,155	-2,195,955	-3,014,582
Total Capital Project Cash Balance (Cum.)	17,274,702	11,491,801	14,869,426	12,497,591	11,162,535	8,966,581	5,951,998
Phase III Tower Encumbrance Schedule	2,840,000	0	3,900,000	0	0	0	1,207,700
Encumbrances							
Project Owner Administration	0	0	0	0	0	0	0
Project Infrastructure Support (FF&E)	0	0	0	0	0	0	0
RISE Contract	421,675	417,228	370,777	324,326	277,875	231,424	184,973
BRPH	650,663	741,485	658,496	575,508	492,517	409,528	326,538
PTI Communications (Microwave)	0	0	0	0	0	0	0
Phase I AK Contract	291,263	0	0	0	0	0	0
Phase II Red Sam Contract	10,615,624	5,600,779	4,785,737	3,555,088	3,142,539	2,838,890	2,709,841
Phase III Tower Contract	2,840,000	2,505,000	5,700,000	4,950,000	4,300,000	3,600,000	2,300,000
OIS Contract	582,310	582,310	537,510	449,075	389,000	20,000	0
TOTAL UNENCUMBERED CASH	1,873,188	1,644,999	2,816,907	2,843,898	2,580,605	1,866,740	430,646

	Jun-99	FY-99 TOTAL	Jul-99	Aug-99	Sep-99	Oct-99	Nov-99	Dec-99	Jan-00	Feb-00
Revenue										
ASTF Grant		0								
Federal Funding		0								
NASA PPF Grant		0								
Federal Funding for Tower	0	4,800,000	0	0	0	0	0	0	0	0
State Appropriation		0								
AADC Corp. Receipts (Bond Proceeds)		0								
AADC Corp. Receipts (Interest Earnings)	41,970	1,396,014	38,282	33,261	27,319	22,774	16,792	14,106	10,670	10,783
Non-Cash/In-Kind Receipts		6,500,000								
Total CPCF Gross Revenue	41,970	12,696,014	38,282	33,261	27,319	22,774	16,792	14,106	10,670	10,783
EXPENDITURES										
Project Owner Admin		97,540								
Rise Alaska		271,950			0	0				
BRPH		342,187								
Project Infrastructure Support (FF&E)		0								
PTI Communications (Temporary)		99,231								
Phase I AK Contract		726,076								
Phase II Red Sam Contract		5,634,280								
OIS Contract		50,920								
Total	0	7,222,185	0	0	0	0	0	0	0	0
Contingency										
BRPH		0								
Phase I AK Contract		441,725								
Phase II Red Sam Contract		0								
Total Contingency	0	441,725	0	0	0	0	0	0	0	0
PROJECTIONS										
Project Owner Administration	5,000	74,348	230,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Project Infrastructure Support (FF&E)	0	0	233,333	233,333	233,333	233,333	233,333	233,333	0	0
RISE Contract	46,451	283,153	46,451	46,451	46,451	40,000	40,000	39,169	0	0
BRPH	78,806	560,931	71,348	71,348	71,348	35,686	0	0	0	0
PTI Communications (Temporary)	14,532	101,727	14,532	14,532	14,532	0	0	0	0	0
PTI Communications (Microwave)	0	0	0	0	0	500,000	0	0	0	0
Working Capital	0	0	1,000,000	0	0	0	0	0	0	0
Total AADC/RISE Projections	142,790	1,040,159	1,595,665	373,665	370,665	814,021	278,333	277,502	5,000	5,000
BRPH Projections										
Phase I AK Contract	0	106,026	0	0	0	0	0	0	0	0
Phase II Red Sam Contract	783,700	9,256,022	1,141,900	106,200	51,598	0	0	0	0	0
Phase III Tower Contract	800,000	6,447,700	500,000	800,000	800,000	300,000	100,000	0	0	0
OIS Contract	0	582,310	0	0	0	0	0	0	0	0
Total BRPH Projections	1,583,700	16,392,057	1,641,900	906,200	851,598	300,000	100,000	0	0	0
Contingency Projections										
Phase I AK Contract	0	185,237	0	0	0	0	0	0	0	0
Phase II Red Sam Contract	626,443	709,983	0	0	0	0	0	0	0	0
Phase III Tower Contract	0	0	0	0	0	0	0	0	0	0
OIS Contract	0	0	0	0	0	0	0	0	0	0
Total Category G	626,443	895,220	0	0	0	0	0	0	0	0
Non-Cash Expenditures										
Range Safety System (In-kind value)	0	6,500,000	0	0	0	0	0	0	0	0
Total CPCF Expenses	2,352,933	32,491,348	3,237,565	1,279,865	1,222,263	1,114,021	378,333	277,502	5,000	5,000
9% Contingency on Remaining Exp.	211,794	1,714,008	291,381	114,918	110,004	100,262	34,050	24,975	450	450
Net Capital Project Cash Flow	-2,522,727	-21,509,340	-3,490,664	-1,356,522	-1,304,947	-1,191,509	-395,591	-288,369	5,420	5,333
Total Capital Project Cash Balance (Cum.)	3,429,271		-61,392	-1,419,914	-2,724,861	-3,916,370	-4,311,962	-4,600,331	-4,594,911	-4,589,578
Phase III Tower Encumbrance Schedule	0	7,947,700	1,000,000	0	0	0	0	0	0	0
Encumbrances										
Project Owner Administration	0		0	0	0	0	0	0	0	0
Project Infrastructure Support (FF&E)	0		1,166,667	933,333	700,000	466,667	233,333	0	0	0
RISE Contract	138,522		92,071	45,620	119,169	79,169	39,169	0	0	0
BRPH	249,732		178,384	107,036	35,688	0	0	0	0	0
PTI Communications (Microwave)	0		500,000	0	0	0	0	0	0	0
Phase I AK Contract	0		0	0	0	0	0	0	0	0
Phase II Red Sam Contract	1,299,698		157,798	51,598	0	0	0	0	0	0
Phase III Tower Contract	1,500,000		2,000,000	1,200,000	400,000	100,000	0	0	0	0
OIS Contract	0		0	0	0	0	0	0	0	0
TOTAL UNENCUMBERED CASH	241,320		-4,156,311	-3,757,501	-3,979,716	-4,562,208	-4,584,484	-4,600,331	-4,594,911	-4,589,578

Kodiak Launch Complex
Confidential Draft of 9/30/98

Capital Project Cash Flows

	Mar-00	Apr-00	May-00	Jun-00	FY-00 TOTAL	Jul-00	Aug-00	Sep-00	Oct-00	Nov-00
Revenue										
ASTF Grant					0					
Federal Funding					0					
NASA PPF Grant					0					
Federal Funding for Tower	0	0	0	0	0	0	0	0	0	0
State Appropriation					0					
AADC Corp. Receipts (Bond Proceeds)					0					
AADC Corp. Receipts (Interest Earnings)	8,407	8,440			191,036					
Non-Cash/In-Kind Receipts					0					
Total CPCF Gross Revenue	8,407	8,440	0	0	191,036	0	0	0	0	0
EXPENDITURES										
Project Owner Admin					0					
Rise Alaska					0					
BRPH					0					
Project Infrastructure Support (FF&E)					0					
PTI Communications (Temporary)					0					
Phase I AK Contract					0					
Phase II Red Sam Contract					0					
CIS Contract					0					
Total	0	0	0	0	0	0	0	0	0	0
Contingency										
BRPH					0					
Phase I AK Contract					0					
Phase II Red Sam Contract					0					
Total Contingency	0	0	0	0	0	0	0	0	0	0
PROJECTIONS										
Project Owner Administration	5,000	5,000	5,000	5,000	285,000	230,000	5,000	5,000	5,000	5,000
Project Infrastructure Support (FF&E)	0	0	0	0	1,400,000	0	0	0	0	0
RISE Contract	0	0	0	0	258,522	0	0	0	0	0
BRPH	0	0	0	0	249,732	0	0	0	0	0
PTI Communications (Temporary)	0	0	0	0	43,597	0	0	0	0	0
PTI Communications (Microwave)	0	0	0	0	500,000	0	0	0	0	0
Working Capital	0	0	0	0	1,000,000	0	0	0	0	0
Total AADC/RISE Projections	5,000	5,000	5,000	5,000	3,736,851	230,000	5,000	5,000	5,000	5,000
BRPH Projections										
Phase I AK Contract	0	0	0	0	0	0	0	0	0	0
Phase II Red Sam Contract	0	0	0	0	1,299,698	0	0	0	0	0
Phase III Tower Contract	0	0	0	0	2,500,000	0	0	0	0	0
OIS Contract	0	0	0	0	0	0	0	0	0	0
Total BRPH Projections	0	0	0	0	3,799,698	0	0	0	0	0
Contingency Projections										
Phase I AK Contract	0	0	0	0	0	0	0	0	0	0
Phase II Red Sam Contract	0	0	0	0	0	0	0	0	0	0
Phase III Tower Contract	0	0	0	0	0	0	0	0	0	0
OIS Contract	0	0	0	0	0	0	0	0	0	0
Total Category G	0	0	0	0	0	0	0	0	0	0
Non-Cash Expenditures										
Range Safety System (In-kind value)	0	0	0	0	0	0	0	0	0	0
Total CPCF Expenses	5,000	5,000	5,000	5,000	7,538,549	230,000	5,000	5,000	5,000	5,000
9% Contingency on Remaining Exp.	450	450	450	450	678,289	20,700	450	450	450	450
Net Capital Project Cash Flow	2,957	2,990	-5,450	-5,450	-8,033,602	-250,700	-5,450	-5,450	-5,450	-5,450
Total Capital Project Cash Balance (Cum.)	-4,586,621	-4,583,631	-4,589,081	-4,594,531		-4,845,231	-4,850,681	-4,858,131	-4,861,581	-4,867,031
Phase III Tower Encumbrance Schedule	0	0	0	0	1,000,000					
Encumbrances										
Project Owner Administration	0	0	0	0		0	0	0	0	0
Project Infrastructure Support (FF&E)	0	0	0	0		0	0	0	0	0
RISE Contract	0	0	0	0		0	0	0	0	0
BRPH	0	0	0	0		0	0	0	0	0
PTI Communications (Microwave)	0	0	0	0		0	0	0	0	0
Phase I AK Contract	0	0	0	0		0	0	0	0	0
Phase II Red Sam Contract	0	0	0	0		0	0	0	0	0
Phase III Tower Contract	0	0	0	0		0	0	0	0	0
OIS Contract	0	0	0	0		0	0	0	0	0
TOTAL UNENCUMBERED CASH	-4,586,621	-4,583,631	-4,589,081	-4,594,531		-4,845,231	-4,850,681	-4,858,131	-4,861,581	-4,867,031

	Dec-00	Jan-01	Feb-01	Mar-01	Apr-01	May-01	Jun-01	FY-01 TOTAL	Jul-01	Aug-01	Sep-01	Oct-01	Nov-01
Revenue													
ASTF Grant								0					
Federal Funding								0					
NASA PPF Grant								0					
Federal Funding for Tower	0	0	0	0	0	0	0	0	0	0	0	0	0
State Appropriation								0					
AADC Corp. Receipts (Bond Proceeds)								0					
AADC Corp. Receipts (Interest Earnings)								0					
Non-Cash/In-Kind Receipts								0					
Total CPCF Gross Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPENDITURES													
Project Owner Admin								0					
Rise Alaska								0					
BRPH								0					
Project Infrastructure Support (FF&E)								0					
PTI Communications (Temporary)								0					
Phase I AK Contract								0					
Phase II Red Sam Contract								0					
CIS Contract								0					
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Contingency													
BRPH								0					
Phase I AK Contract								0					
Phase II Red Sam Contract								0					
Total Contingency	0	0	0	0	0	0	0	0	0	0	0	0	0
PROJECTIONS													
Project Owner Administration	5,000	5,000	5,000	5,000	5,000	5,000	4,347	284,347	0	0	0	0	0
Project Infrastructure Support (FF&E)	0	0	0	0	0	0	0	0	0	0	0	0	0
RISE Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
BRPH	0	0	0	0	0	0	0	0	0	0	0	0	0
PTI Communications (Temporary)	0	0	0	0	0	0	0	0	0	0	0	0	0
PTI Communications (Microwave)	0	0	0	0	0	0	0	0	0	0	0	0	0
Working Capital	0	0	0	0	0	0	0	0	0	0	0	0	0
Total AADC/RISE Projections	5,000	5,000	5,000	5,000	5,000	5,000	4,347	284,347	0	0	0	0	0
BRPH Projections													
Phase I AK Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
Phase II Red Sam Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
Phase III Tower Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
OIS Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
Total BRPH Projections	0	0	0	0	0	0	0	0	0	0	0	0	0
Contingency Projections													
Phase I AK Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
Phase II Red Sam Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
Phase III Tower Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
OIS Contract	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Category G	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-Cash Expenditures													
Range Safety System (In-kind value)	0	0	0	0	0	0	0	0	0	0	0	0	0
Total CPCF Expenses	5,000	5,000	5,000	5,000	5,000	5,000	4,347	284,347	0	0	0	0	0
9% Contingency on Remaining Exp.	450	450	450	450	450	450	391	25,591	0	0	0	0	0
Net Capital Project Cash Flow	-5,450	-5,450	-5,450	-5,450	-5,450	-5,450	-4,739	-309,939	0	0	0	0	0
Total Capital Project Cash Balance (Cum.)	-4,872,481	-4,877,931	-4,883,381	-4,888,831	-4,894,281	-4,899,731	-4,904,469		-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469
Phase III Tower Encumbrance Schedule													
Encumbrances													
Project Owner Administration	0	0	0	0	0	0	0		0	0	0	0	0
Project Infrastructure Support (FF&E)	0	0	0	0	0	0	0		0	0	0	0	0
RISE Contract	0	0	0	0	0	0	0		0	0	0	0	0
BRPH	0	0	0	0	0	0	0		0	0	0	0	0
PTI Communications (Microwave)	0	0	0	0	0	0	0		0	0	0	0	0
Phase I AK Contract	0	0	0	0	0	0	0		0	0	0	0	0
Phase II Red Sam Contract	0	0	0	0	0	0	0		0	0	0	0	0
Phase III Tower Contract	0	0	0	0	0	0	0		0	0	0	0	0
OIS Contract	0	0	0	0	0	0	0		0	0	0	0	0
TOTAL UNENCUMBERED CASH	-4,872,481	-4,877,931	-4,883,381	-4,888,831	-4,894,281	-4,899,731	-4,904,469		-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469

	Dec-01	Jan-02	Feb-02	Mar-02	Apr-02	May-02	Jun-02	FY-02 Total	
Revenue									
ASTF Grant								0	5,000,000
Federal Funding								0	18,110,000
NASA PPF Grant								0	4,899,958
Federal Funding for Tower	0	0	0	0	0	0	0	0	4,800,000
State Appropriation								0	0
AADC Corp. Receipts (Bond Proceeds)								0	0
AADC Corp. Receipts (Interest Earnings)								229,536	1,587,050
Non-Cash/In-Kind Receipts								0	6,500,000
Total CPCF Gross Revenue	0							229,536	40,897,008
EXPENDITURES									
Project Owner Admin								0	221,551
Rise Alaska								0	536,428
BRPH								0	814,804
Project Infrastructure Support (FF&E)									0
PTI Communications (Temporary)									99,231
Phase I AK Contract								0	2,366,545
Phase II Red Sam Contract								0	5,634,280
CIS Contract								0	574,254
Total	0	0	0	0	0	0	0	0	10,247,093
Contingency									
BRPH									0
Phase I AK Contract								0	488,163
Phase II Red Sam Contract								0	0
Total Contingency	0	0	0	0	0	0	0	0	488,163
PROJECTIONS									
Project Owner Administration	0	0	0	0	0	0	0	0	843,695
Project Infrastructure Support (FF&E)	0	0	0	0	0	0	0	0	1,400,000
RISE Contract	0	0	0	0	0	0	0	0	541,075
BRPH	0	0	0	0	0	0	0	0	830,663
PTI Communications (Temporary)	0	0	0	0	0	0	0	0	145,324
PTI Communications (Microwave)	0	0	0	0	0	0	0	0	500,000
Working Capital	0	0	0	0	0	0	0	0	1,000,000
Total AADC/RISE Projections	0	0	0	0	0	0	0	0	5,061,357
BRPH Projections									
Phase I AK Contract	0	0	0	0	0	0	0	0	106,026
Phase II Red Sam Contract	0	0	0	0	0	0	0	0	10,555,720
Phase III Tower Contract	0	0	0	0	0	0	0	0	8,947,700
OIS Contract	0	0	0	0	0	0	0	0	582,310
Total BRPH Projections	0	0	0	0	0	0	0	0	20,191,755
Contingency Projections									
Phase I AK Contract	0	0	0	0	0	0	0	0	185,237
Phase II Red Sam Contract	0	0	0	0	0	0	0	0	709,983
Phase III Tower Contract	0	0	0	0	0	0	0	0	0
OIS Contract	0	0	0	0	0	0	0	0	0
Total Category G	0	0	0	0	0	0	0	0	895,220
Non-Cash Expenditures									
Range Safety System (In-kind value)	0	0	0	0	0	0	0	0	6,500,000
Total CPCF Expenses	0	0	0	0	0	0	0	0	43,383,589
9% Contingency on Remaining Exp.	0	0	0	0	0	0	0	0	2,417,389
Net Capital Project Cash Flow	0	0	0	0	0	0	0	229,536	
Total Capital Project Cash Balance (Cum.)	-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469		
Phase III Tower Encumbrance Schedule									
Encumbrances									
Project Owner Administration	0	0	0	0	0	0	0		
Project Infrastructure Support (FF&E)	0	0	0	0	0	0	0		
RISE Contract	0	0	0	0	0	0	0		
BRPH	0	0	0	0	0	0	0		
PTI Communications (Microwave)	0	0	0	0	0	0	0		
Phase I AK Contract	0	0	0	0	0	0	0		
Phase II Red Sam Contract	0	0	0	0	0	0	0		
Phase III Tower Contract	0	0	0	0	0	0	0		
OIS Contract	0	0	0	0	0	0	0		
TOTAL UNENCUMBERED CASH	-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469	-4,904,469		

CLANCY,
GARDINER,
&PIERCE,LLC

Financial Counsel to Governments,
Non-Profits & Public Private Ventures

KODIAK LAUNCH COMPLEX
REASONABLENESS REVIEW
February 3, 1999

Clancy, Gardiner & Pierce, LLC, acting as advisor to the Alaska Industrial Development and Export Authority (the "Authority"), has been asked to perform a reasonableness review of the existing status and future projections related to the Kodiak Launch Complex ("KLC"). This review is being undertaken to consider the reasonableness of existing construction estimates and financial projections. This review is not intended to be a comprehensive financial viability and due diligence analysis of the variety ordinarily performed by the Authority in approving development finance projects or in underwriting loans under the Authority's credit programs. Rather, the review has consisted of a limited investigation of existing project information to determine its reasonableness.

There are essentially two components to the scope of the Authority's review, an engineering/ construction review, and a financial review. The Authority's in-house engineering staff has conducted the engineering/construction component of the review, which is attached as Exhibit A, while the financial review component has been conducted by Clancy, Gardiner & Pierce, LLC.

Executive Summary

Based on a review of available information related to the construction, engineering, funding and operation of the KLC, we consider the assumptions used in the financial projections and construction estimates to be reasonable. While there remains significant uncertainty in the actual viability of the private rocket launch market, KLC has used reasonable caution in its provisional operating budget.

Financial Review

We reviewed numerous documents provided by Alaska Aerospace Development Corporation ("AADC"). These documents included excerpts from the draft AADC 1999 Business Plan, confidential KLC cash flow projections, audits for 1997 and 1998, proprietary documents from Lockheed Martin, market projections prepared by the FAA, grant agreements, and bank statements. In addition to review of the above documents, we contacted Lockheed Martin, AADC and Rise Alaska personnel.

Operations

We have reviewed the analysis we prepared regarding KLC in 1995. The projections used in the prior analysis have been refined in KLC's current operating model. The model now suggests a less aggressive launch schedule, with much more detailed operating costs. While the initial model had a vague notion of how the facility would function, the current model has been developed with an actual operating plan in mind. Cost estimates have been provided by firms that are currently providing similar services to other launch sites. The operating cash flow has been broken into two sections, one which deals with administrative costs, which are projected to remain flat regardless of the number of launches, and the second group of expenses deals with launch operations. It is expected that the latter of these two categories will be managed on a contract basis with an outside firm during the first few years of operation. This will allow rapid staffing increases or decreases in response to increased or decreased demand. These costs appear to be reasonable and were developed in conjunction with Lockheed Martin and further refined by review with Orbital Science (a company that provides these types of services). These costs are likely to be born by the actual users but have been budgeted as an un-reimbursed expense in the pro-forma. Non-personnel expenses also appear reasonable. Electricity is the largest non-personnel item and is based on current Kodiak Electric Association rates.

The cash flow pro-forma shows an untapped Working Capital Liquidity Fund. Operating revenues, using AADC's launch projections, remain sufficient on a yearly basis to cover all yearly cashflow. Should a launch be delayed or fail to materialize during the early operation of the facility, it is anticipated that the Liquidity Fund might be used but is not necessary using the current projections. The $1 million fund balance provides a reasonable balance to cover a delayed launch.

Revenues are based on the concept of 4 launches per year. The original business plan called for 6 launches per year. Cash flow remains sufficient when launches are reduced to 3 times a year and are very strong at 5 launches per year. The number of launches each year seems reasonable. In 1995, several competing sites were considered. The world is better known now. Launch facilities in Alabama, Hawaii, and California have not proceeded. The facility in Manitoba has closed. The Florida facility is not a direct competitor. International launch facilities are distant from the US and make them less likely competitors. Launch demands, as projected in the May 1998 FAA report, have remained constant from the earlier analysis with a baseline of between 30 and 45 launches per year in demand. The KLC site serves a unique market which has both governmental and commercial application. Lockheed Martin has reached agreement with AADC and the parties are formalizing a Memorandum of Agreement ("MOA") to use the KLC facility. Lockheed Martin is projecting launches in excess of the number used in the pro-forma. Both the MOA and the launch projections have been discussed with Lockheed Martin. They concur with the feasibility of the facility. We, therefore, believe the assumptions used for the number of launches per year to be reasonable.

It should also be noted that the initial funding appears to provide reasonable cash flow reserves for the initial phase of operation, even in the case of a 25% reduction in launches under the current business plan. We believe the business plan, as noted, is conservative and it is reasonable to assume the actual number of launches per year are likely to be higher than the model currently projects. Also as noted, a higher number of launches only improves the cash flow of the facility over the next 2 to 3 years.

Upon reviewing the current agreements with Lockheed Martin and based upon research done in the initial report, we believe the estimates of revenues per launch are within the expected range and are therefore a reasonable basis for the business plan.

Capital

KLC's business plan shows the following funding sources:

Funding Received	
Alaska Science and Technology	$5,000,000
National Guard	$17,910,000
NASA	$4,899,958
Sub Total	$27,809,958
Additional Funding Secured	
Request, Federal (via National Guard) (needs State Appropriation)	$4,800,000
Interest Earnings	$1,578,000
Sub Total	$6,378,000
Funding Needed	
FY 2000 State of Alaska	$5,000,000
Total	$39,187,958

Grants, or funds received, match the business plan. We conclude it is reasonable to assume the receipt of the above funds, other than the State of Alaska budget request is reasonable. We offer no opinion on this item.

Insurance

AADC has provided for standard insurance coverage. We have discussed coverage and expected premiums for such insurance with AADC. We believe the insurance coverage suggested by AADC is reasonable in light of the exposure expected by AADC.

Summary

AADC has used reasonable assumptions in the financial projections they have prepared. The financial projections show sufficient cash reserves to allow a 25% drop in expected launches in the first 2 years. Reasonable assumptions have also been used in the capital plan. Engineering

and construction estimates, as reviewed by AIDEA, are adequate. Without the final requested funding in the FY 2000 budget, it is not clear how the facility will be completed. There is $3.5 million in contingency and start-up capital, and another $500,000 might be available through postponing certain permanent components. We would not recommend using the contingency fund in this manner. In conjunction with AADC's bonding authority, it might be possible to finish the project without the final funds, but clearly it would significantly change the cash flow and working capital reserves during the first few years. The exact result of such changes is uncertain.

DRAFT
APPENDIX A
AIDEA ENGINEERING CONSTRUCTION REASONABLENESS REVIEW OF THE KODIAK LAUNCH COMPLEX

February 5, 1999

The staff of the Alaska Industrial Development and Export Authority ("AIDEA" or the "Authority") has performed an engineering/construction reasonableness review of the existing status and future projections related to the Kodiak Launch Complex ("KLC"). This review was conducted to consider the reasonableness of existing construction estimates and financial projections and is not intended to be a comprehensive financial viability and due diligence analysis of the variety ordinarily performed by the Authority. Rather, the review consisted of a limited investigation of existing project information to determine its reasonableness. A site visit was not part of this review. Information reviewed includes the Authority's project correspondence files, Alaska Aerospace Development Corporation's ("AADC") written reports, project construction contracts, plans and specifications, project monthly reports, contractor pay estimates, and information obtained through meetings and telephone conversations with AADC and Rise Alaska (project manager) personnel over a several week time frame.

Executive Summary

It is the Authority's opinion that, after reviewing AADC's capital models, Capital Needs Analysis, and the present status of the engineering/construction efforts, AADC's proposed budget appears to be reasonable and adequate to complete the project as presented to AIDEA. We recommend that a contingency equivalent to 10% of the remaining construction contract work ($16,807,059 as of 1/99) be identified and maintained as engineering and construction contingency until construction has been deemed complete. It appears that there are sufficient funds within the current budget projections to cover the recommended contingency.

Status of Construction

Presently, the construction of the project is roughly 42 percent complete. The Phase I site work contract is 95% complete, the Phase II general construction contract is 51% complete, and the Phase III launch tower contract is now in the final stages of negotiation. From a project schedule standpoint, the basic completion of Phase I site work consisting of predominately civil construction is significant since project delays and increased costs are often associated with unanticipated ground conditions. The project is now compliant with AADC's present schedule and budget. The one outstanding construction claim of $475,000, primarily relating to last fall's rocket launch, appears to be nearing resolution. Substantial completion of the Phase II contract is scheduled for March 20, 1999. The first of several NTP's for the Phase III

contract has been issued, with its substantial completion scheduled for November 1999. Based on the present AADC schedule, all project construction should be completed by December 1999. At this time, we are not aware of any existing circumstances that could significantly delay construction completion.

Initial Construction Budget

As is typical of projects of this size and complexity, the KLC project cost estimates and potential funding sources were modified and refined during the project's predevelopment phase during the mid-1990's. Solidification of costs and funding sources had occurred by early 1997 when total project cost estimates had been refined to roughly $28.85 million, with the construction cost component estimated to be $25 million and the remaining amount reflecting capitalized interest ($1.6 million) and construction management ($2.25 million). Funding sources identified at that time were $28 million in grant monies consisting of $18 million of federal funds, $5 million NASA funds, and $5 million Alaska Science and Technology Foundation ("ASTF") funds.

Status of the Construction/Engineering Budget

Based on existing construction contracts and related management costs and contingencies, it would now appear that final construction costs will exceed AADC's early 1997 project cost estimates. The three construction contracts, with approved extras and negotiated claims costs, now total $29,520,655 with approximately $16,807,059 of this work remaining to be completed as of November 30, 1998. With Phase I now complete and Phase II substantially complete, the risks have been significantly reduced and the Authority believes a 10% contingency is reasonable. The addition of the 10% engineering/construction cost contingency ($1,680,706) for the yet to be completed work results in a projected final construction cost of $31,201,361. Our review indicates that construction management ("CM"), project management ("PM") and support costs have increased to $3,624,477 from initial estimates of $2.75 million. The Authority projects that the project's final total construction costs (construction contracts plus contingency plus CM, PM, and support costs) will be about $34,825,838, or about $7,575,838 over AADC's 1997 $27.25 million construction budget (does not include original capitalized interest component).

KLC Capital Requirements:

		TOTAL	REMAINING (As of 11/30)
Construction			
Phase I (Site improvements)	$	3,145,971	$119,494
Phase II (General Construction)		16,899,984	$7,212,865
Phase III (Launch Tower)		8,947,700	$8,947,700
Outstanding Claim		$475,000	$475,000
Phase III cost increase		$52,000	$52,000
Subtotal		$29,520,655	$16,807,059
10 % Contingency on uncompleted work		$1,680,706	$1,680,706
Total Construction		$31,201,361	$18,487,765
Non-Construction *			
Administration and Project Management	$	3,624,477	
Net against facility modification		-200,000	
Microwave Communications		500,000	
Project Infrastructure, FF&E		1,644,555	
Operations Intercom System		1,156,564	
Working Capital		1,000,000	
Remaining program contingency		$261,001	
Total Non-Construction		$7,986,597	
Grand Total		$39,187,956	

* Items not reviewed by AIDEA

AADC confirms that the final scope of work has not been significantly modified from the time the 1997 project budget was developed. Expected cost overruns can be attributed to a variety of factors. The early 1997 KLC budget was based on very preliminary design engineering. As the detailed project design developed, the early 1997 budget was modified to reflect the detail design changes. Due to the length of the funding process, a delay in AADC's receipt of federal funds coupled with some construction cost underestimation, bids from potential contractors exceeded those contained in the early 1997 budget estimate. As a result of the funding delay, AADC was unable to initiate its procurement process and award a contract on schedule, thus causing construction and material cost escalation. Rise Alaska personnel indicated that construction and material cost escalation had a particularly deleterious cost effect on the Phase III construction component, and the launch tower because of dramatic increases in structural steel prices.

Status of Rezanoff Highway/Pasagshak Road

In October 1998, AADC in conjunction with Thiokol and Lockheed, a rocket manufacturer, identified several inadequacies relating to the haul route between the Lash Dock Facility and the KLC. Following subsequent discussions with Alaska Department of Transportation and Public Facilities ("ADOTPF") officials, ADOTPF has reportedly offered maintenance upgrades and intensified grading/snow removal immediately prior to load transport. The ADOTPF proposed plan for resolving the immediate road inadequacy issues appears satisfactory, at least initially, to accommodate the anticipated heavy, bulky rocket loads. Thiokol is planning on transporting a "pathfinder" dummy rocket motor to the launch pad in December 1999 to test the adequacy and reliability of the transportation systems. AADC has indicated that they are working with ADOTPF and local legislators to obtain state and federal funding for long-term upgrades to the road system. AIDEA expresses no opinion as to the sufficiency of the road upgrades and the extent that additional upgrades might be necessary to assure the viability of the launch complex.

Summary

Presently, about half of the projected construction budget has been expended to complete a like percentage of construction. The project's construction/engineering appears to be on time and within the current budget estimate. The project has generally surpassed the development and construction phases where one might expect significant upside as well as downside cost surprises. Construction claims, with the exception of the $475,000 claim that is reported to be nearing a negotiated settlement, have not been identified nor are anticipated. There are no outstanding claims on either the CM or PM contracts, and relations with the construction contractors are reported to be good. The recommended 10% construction/engineering contingency should be adequate to insure completion under the present budget. Within the confines of this review, staff could not develop an opinion as to the reasonableness of the cost and contingency requirements of the non-engineering/construction items; specifically, microwave communications, project furniture, fixtures and electrical ("FF&E"), operations intercom system, working capital, range safety, and road upgrades. AADC's construction managers should continue to take a proactive stance to resolve construction/engineering issues as they arise in order to insure that the project's cost goals are met.

issuance of the bond or note and the character of the project in a challenge of the validity of the bond or note or the security for it. (§ 2 ch 88 SLA 1991)

Revisor's notes. — In 1992, "AS 14.40.821 — 14.40.990" was substituted for "this chapter" in the last sentence to correct a manifest error in enactment.

Secs. 14.40.903 — 14.40.905. [Renumbered as AS 14.42.015 — 14.42.020.]

Sec. 14.40.906. Bonds exempt from taxes. Bonds and other obligations of the corporation are issued for an essential public and governmental purpose and are public instrumentalities and, together with interest on them and income from them, are exempt from taxes. (§ 2 ch 88 SLA 1991)

Sec. 14.40.907. [Renumbered as AS 14.42.025.]

Sec. 14.40.908. Independent financial advisor. In negotiating the private sale of bonds or bond anticipation notes to an underwriter, the corporation shall retain a financial advisor who is independent from the underwriter. The financial advisor may not bid on the bonds or notes if offered at public sale or negotiate for their purchase if sold at private sale. (§ 2 ch 88 SLA 1991)

Sec. 14.40.909. [Renumbered as AS 14.42.030.]

Sec. 14.40.910. Exceptions. [Repealed, § 2 ch 98 SLA 1971.]

Sec. 14.40.911. [Renumbered as AS 14.42.035.]

Sec. 14.40.912. Additional powers to secure bonds or obligations under leases. In connection with the issuance of bonds or the incurring of obligations under leases and in order to secure the payment of bonds or lease obligations, the corporation, in addition to its other powers, may

(1) pledge all or a part of its gross or net rents, fees, or revenues to which its right exists or may exist;

(2) mortgage or encumber all or a part of its real or personal property, owned or later acquired;

(3) covenant against pledging all or a part of its rents, fees, and revenue, or against mortgaging all or a part of its real or personal property, to which its right or title exists or may come into existence or against permitting or suffering any lien on the revenues or property;

(4) covenant with respect to limitations on its right to sell, lease, or otherwise dispose of a space-related project or a part of a space-related project;

(5) covenant as to what other, or additional debts or obligations may be incurred by it;

(6) covenant as to the bonds to be issued and as to the issuance of the bonds in escrow or otherwise, and as to the use and disposition of the proceeds of bonds;

(7) provide for the replacement of lost, destroyed, or mutilated bonds;

(8) covenant against extending the time for the payment of its bonds or interest on the bonds;

(9) redeem the bonds, and covenant for their redemption and to provide the terms and conditions of redemption;

(10) covenant as to the rents and fees to be charged in the operation of a space-related project, the amount to be raised each year or other period of time by rents, fees, and other revenue, and as to the use and disposition of this revenue;

Revisor's notes. — In 1992, "AS 14.40.821 — 14.40.990" was substituted for "this chapter" to correct a manifest error in enactment.

Cross references. — For legislative approval of construction of the Alaska Orbital Launch Complex, see ch. 100, SLA 1994 in the Temporary and Special Acts.

Sec. 14.40.890. Funding. [Repealed, § 22 ch 136 SLA 1974.]

Sec. 14.40.891. Issuance of bonds, notes, and refunding bonds. (a) Except as provided in (b) of this section, the corporation may issue bonds in its discretion for any of its corporate purposes and may issue refunding bonds for the purpose of paying or retiring bonds previously issued by it.

(b) The corporation may not, without prior legislative approval, issue bonds, other than refunding bonds,

(1) in a total amount in excess of $1,000,000 each calendar year; or

(2) if the annual debt service on all outstanding bonds issued and proposed to be issued exceeds $1,000,000 in a fiscal year. (§ 2 ch 88 SLA 1991)

Sec. 14.40.896. Security for bonds. The corporation may issue bonds including but not limited to bonds on which the principal and interest are payable (1) exclusively from the income and revenue of the space-related project financed with the proceeds of the bonds, (2) exclusively from the income and revenue of designated space-related projects whether or not they are financed in whole or in part with the proceeds of the bonds, (3) from its revenue or other assets generally, or (4) exclusively from rents, fees, charges, or other revenue collected or received by the corporation. Bonds may be additionally secured by a pledge of a grant or contribution from the federal government or from another source, or by a pledge of income or revenue of the corporation, or by a mortgage of a space-related project or other property of the corporation. (§ 2 ch 88 SLA 1991)

Sec. 14.40.899. Limitation of liability on bonds. The members of the corporation and a person executing the bonds are not liable personally on the bonds by reason of their issuance. The bonds of the corporation are not a debt of the state or a political or municipal corporation or other subdivision of the state, including the University of Alaska, and each bond must so state on its face. Neither the state nor a political or municipal corporation or other subdivision of the state, including the University of Alaska, other than the corporation is liable on the bonds, nor are the bonds payable out of funds or properties other than those of the corporation. The corporation may not pledge the faith of the people of the state for a loan or obligation. Bonds of the corporation are not a debt, indebtedness, or the borrowing of money within the meaning of a limitation or restriction on the issuance of bonds contained in the constitution or laws of the state. (§ 2 ch 88 SLA 1991)

Sec. 14.40.900. Contractual agreements. [Repealed, § 2 ch 98 SLA 1971.]

Sec. 14.40.901. [Renumbered as AS 14.42.010.]

Sec. 14.40.902. Issuance and sale of bonds and notes. Bonds and notes of the corporation are authorized by adoption of a resolution prescribing the date of issuance and maturity, interest rate, denomination, form, conversion privilege, rank or priority, execution, terms of redemption, medium, and place of payment. Bonds and notes may be sold in the manner, on the terms, and at the price the corporation determines. Each bond and note is negotiable. The signature of a member or an officer upon a bond or note or coupon is not invalidated by that person's ceasing to hold office before the delivery of the bond or note. The recitation of a bond or note that it has been issued in the financing of a space-related project or purpose under AS 14.40.821 — 14.40.990 is conclusive as to the

Economic Effect of the November 1998 Launch on the Kodiak Island Borough and on the State of Alaska

In November 1998, the Air Force launched a missile from the Alaska Aerospace Development Corporation's (AADC) facility at Narrow Cape on Kodiak Island. The total economic effect of that launch was an estimated $1.3 million in sales and $450,000 in payroll. It created the equivalent of 19 year-round jobs. About 55 percent of that effect was on Kodiak Island and about 45 percent in Anchorage.

Those estimates include both the direct effects of the launch and the additional effects of re-spending within Alaska. AADC estimated total expenditures for the launch at $1 million. ISER estimated that people visiting Kodiak to work on the launch spent an additional $14,000 for recreational and personal expenses. Based on those figures, ISER used its input-output model of the Alaska economy to estimate economic effects.

Of the $1 million in expenditures for the launch, close to $200,000 left the state almost immediately, mostly to purchase goods sold in Alaska but manufactured elsewhere. That left about $820,000 in Alaska—$550,000 in Kodiak and $270,000 in Anchorage. This was the launch's direct effect. Alaska households and businesses in turn re-spent that money, creating an additional effect of $500,000 in sales and $400,000 in payroll.

The estimated 19 jobs resulting from the launch are the equivalent of year-round jobs; in fact, the launch created roughly 58 jobs that were concentrated in just a few months of activity associated with the launch. About 60 percent of those jobs were on Kodiak and 40 percent in Anchorage.

Table 1. Economic Significance of November 1998 Launch

	State	Anchorage	Kodiak
Total Expenditures	**1,015,591**	**216,357**	**799,234**
Expenditures outside Alaska	-194,876	-16,226	-178,650
Expenditures from Kodiak to Anchorage	-	+68,497	-68,497
Direct Expenditures Affecting Region	**820,716**	**268,628**	**552,087**
Payroll	$46,804	$0	$46,804
Procurement	$773,912	$268,628	$505,284
Direct Employment (annual average)	2.0	0.0	2.0
Effect of Respending			
Output (sales)	$506,684	$310,831	$195,852
Payroll	$401,689	$183,894	$217,794
Employment (annual average)	17.4	7.5	9.9
Total Effect			
Output (sales)	$1,280,595	$579,460	$701,136
Payroll	$448,493	$183,894	$264,598
Employment (annual average)	19.4	7.5	11.9

Source: ISER estimate based on Alaska I-O model

2/25/99
Attachment 2

ALASKA AEROSPACE DEVELOPMENT CORPORATION

KODIAK LAUNCH COMPLEX
TOTAL BUDGET (TOTAL PROJECTED COST)

A.	Owner Administration		$865,247
B.	Project Management Support		$1,078,103
C.	Architect/Engineer Construction Administration		$1,645,467
D.	Construction		$28,993,654
	Site I	$3,145,971	
	General Construction II	$16,899,984	
	Launch Tower III	$8,947,700	
E.	Microwave Communications		$500,000
F.	Project Infrastructure, FF & E		$1,644,555
G.	Operations Intercom System		$1,156,564
H.	Working Capital		$1,000,000
SUB TOTAL			$36,883,590
I.	Range Safety (in-kind)		$6,500,000
SUB TOTAL			$43,383,590
J.	Program Contingency (9% at remaining cost to complete as of 1/1/99)		$2,417,889
GRAND TOTAL			$45,801,479

2/8/99

ALASKA AEROSPACE DEVELOPMENT CORPORATION

KODIAK LAUNCH COMPLEX
CASH NEEDS ANALYSIS

TOTAL CAPITAL BUDGET		**$45,801,479**
FUNDS AVAILABLE		**$40,897,010**
Federal Funding	$18,110,000*	
NASA	$4,899,960	
ASTF	$5,000,000	
Federal Interest Earnings	$1,587,050	
Federal Grant #2	$4,800,000	
Federal In-Kind	$6,500,000	
FUNDS NEEDED TO COMPLETE		**($4,904,469)**

NOTES:

A. 32% EXPENDED TO DATE

B. ALL MAJOR CONTRACTS IN PLACE

C. 40% COMPLETE CONSTRUCTION

D. CONSERVATIVE CONTINGENCY TO COMPLETE 9%

E. TOTAL COST TO COMPLETE ANALYSIS

F. COORDINATION WITH AIT LAUNCHES SUCCESSFUL

G. SCHEDULE TO COMPLETE APPEARS SECURE

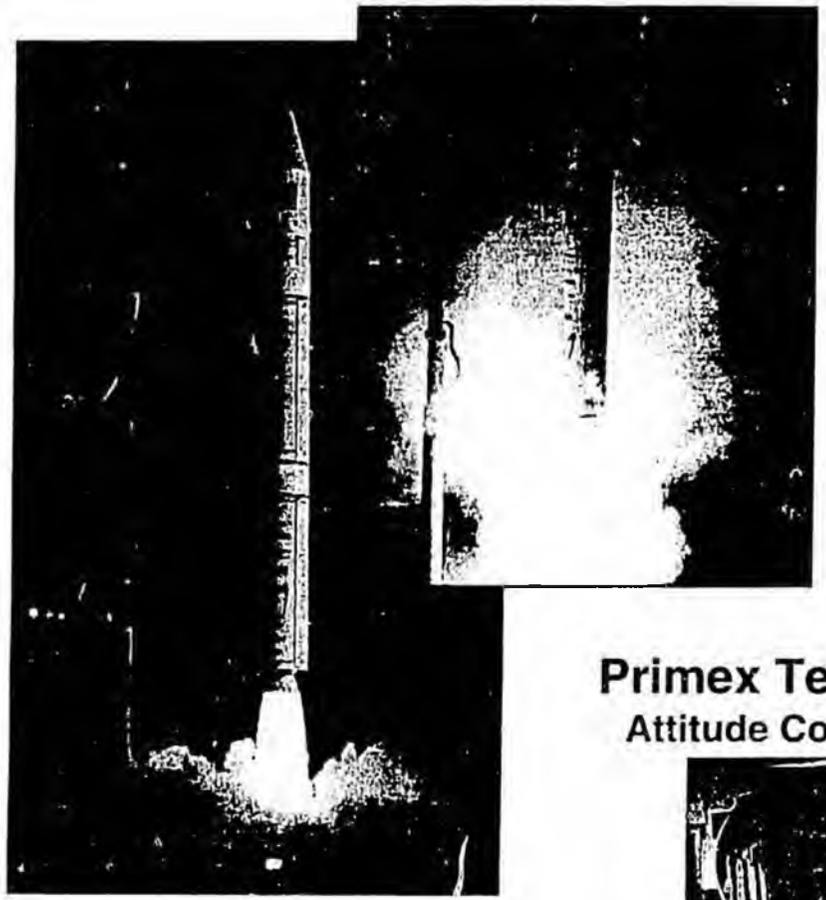
*Please note the $18.11 million in federal funds depicted here differs from the $17.91 million shown in the total KLC capital appropriation summary. The additional $200,000 was a one-time, customer paid facility modification funded through AADC's launch operations appropriation.

2/8/99

2/25/99 Attachment 1

Athena Program Overview

Athena Commercial Partnership



Lockheed Martin Astronautics
- Business Operations
- Vehicle Integration and Analysis
- Launch Operations
- Structures
- OAM Assembly and Checkout

Primex Technologies
Attitude Control System

Thiokol
Castor®120

Pratt & Whitney SPO
Orbus 21®D

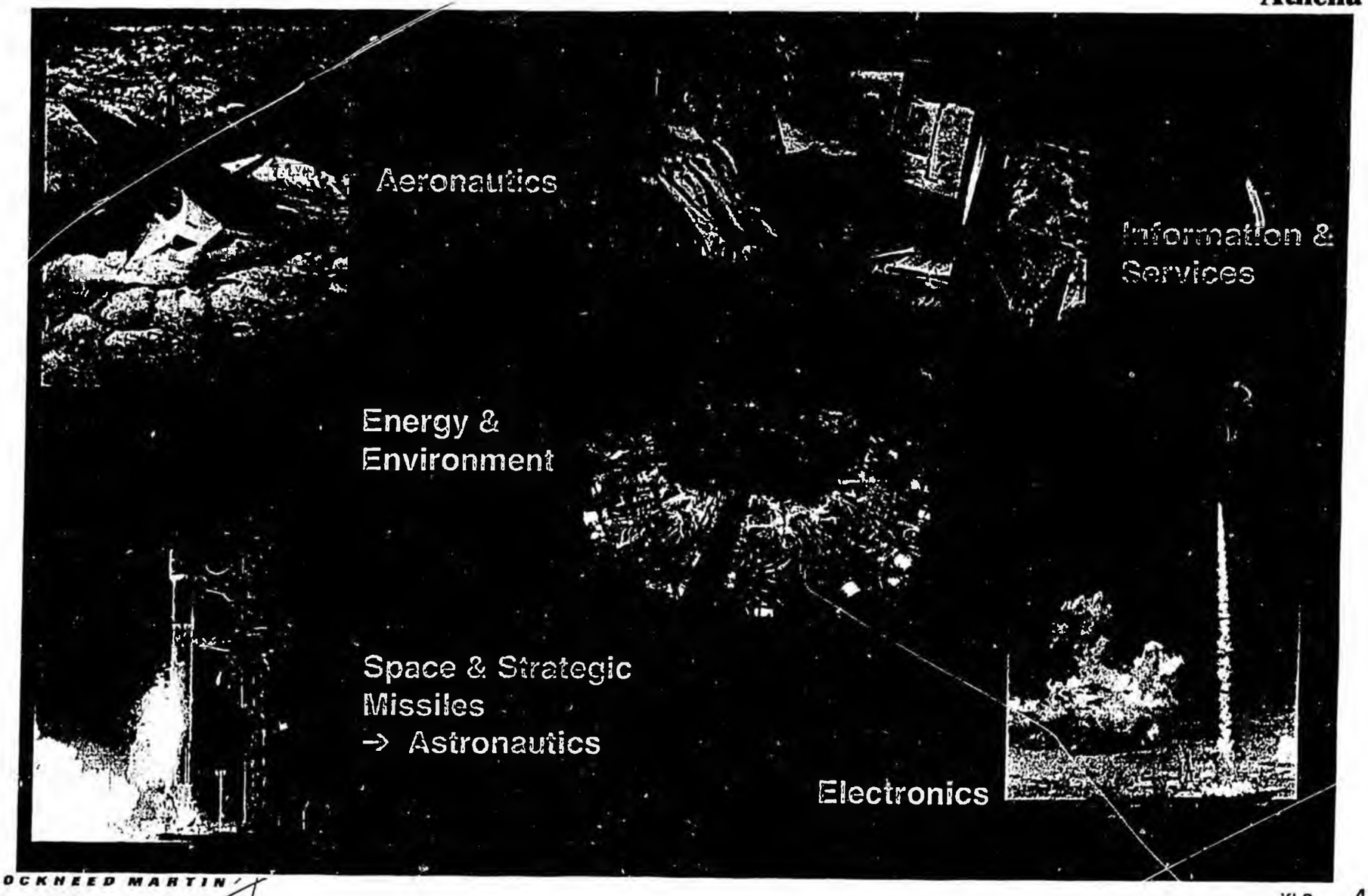
Athena Provides Reliable Low Cost Access to Space

The Athena is the first operational launch system developed without government funding

LOCKHEED MARTIN

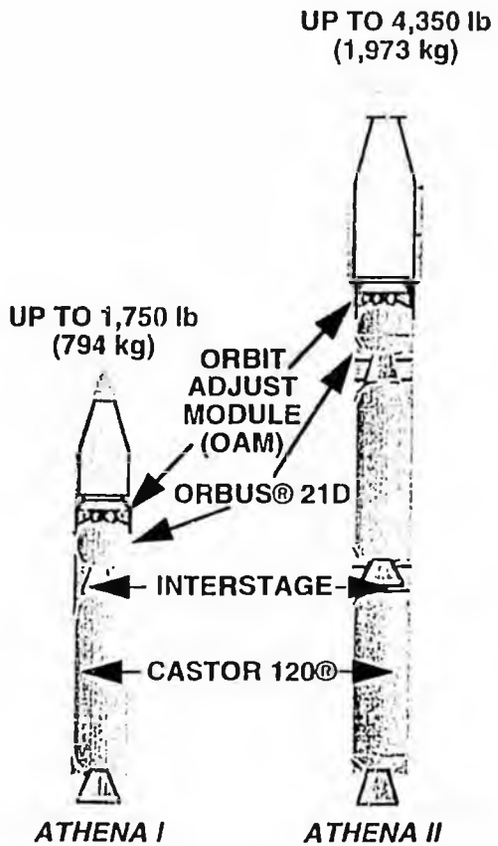
Lockheed Martin Corporation

Athena



LOCKHEED MARTIN

Athena Overview



- Development began in 1993 as wholly-commercial partnership: Lockheed Martin, Thiokol, Pratt&Whitney and Primex
- Modular design to reduce costs and maximize reliability
- 2 Configurations and 2 Launch Sites Currently Operational With Success of:
  - Lewis (A-I) 8/22/97 VAFB
  - Lunar Prospector (A-II) 1/6/98 CCAS
  - ROCSAT-1 (Athena I) 1/26/99 CCAS
- Currently planning to bring additional launch site on-line: Kodiak Island
- Accommodates Up to 12 Launches/Year
- 4 launches remaining on current manifest
  - IKONOS I (Athena II) 2Q'99 VAFB
  - IKONOS II (Athena II) 4Q'99 VAFB
  - SBIRS-LADS (Athena II) 1Q'00 CCAS
  - VCL (Athena I)* 2Q'00 Kodiak

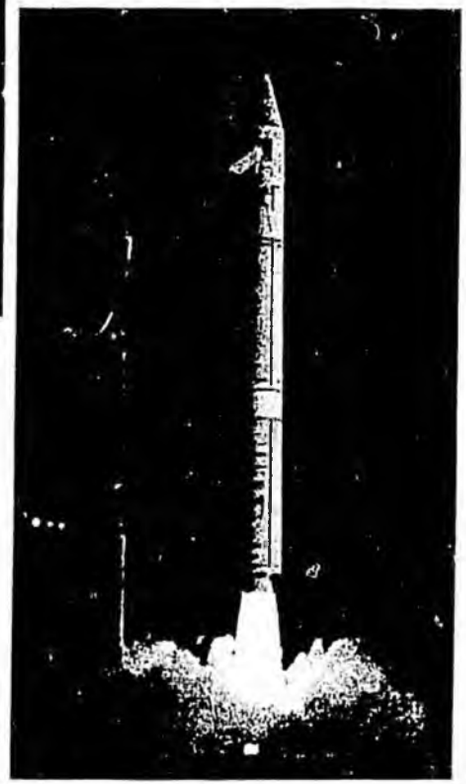
"CASTOR 120®" is a registered trademark of the Thiokol Corporation
"ORBUS® 21" is a registered trademark of United Technology Corporation, Chemical Systems Division

** Awarded and currently negotiating*

Athena Flight Successes

SSTI Lewis

ROCSAT-1



Lunar Prospector

- Three Highly Successful Launches
- Two Vehicle Configurations
- Two Launch Site Activated and Demonstrated

	Requirement		Result	
	Nominal	Tolerance	Achieved	Error
Athena I SSTI-Lewis, 22 August 1997 (note 1)				
Apogee	300 km	+/- 10 km	300.8 km	0.8 km
Perigee	300 km	+10/-83 km	300.1 km	0.1 km
Inclination	97.550°	+/- 0.1°	97.552°	0.002°
Lunar Prospector, 06 January 1998 (note 2)				
Apogee	201.3 km	+/- 10 km	201.8 km	0.5 km
Perigee	153.1 km	+/- 10 km	152.7 km	0.4 km
Inclination	29.186°	+/- 0.2°	29.185°	0.001°
ROCSAT-1, 26 January 1999 (note 3)				
Apogee	600 km	+/- 50 km	600.2 km	0.2 km
Perigee	600 km	+/- 50 km	599.8 km	0.2 km
Inclination	35.00°	+/- 0.2°	34.987°	0.013°

Note 1: Source - Ground track data from NASA Goddard Space Flight Facility
Note 2: Source - Ground track data from Ascension Island Tracking Station
Note 3: Source - Athena Guidance Unit. Currently being confirmed by tracking data

Athena Design Validated

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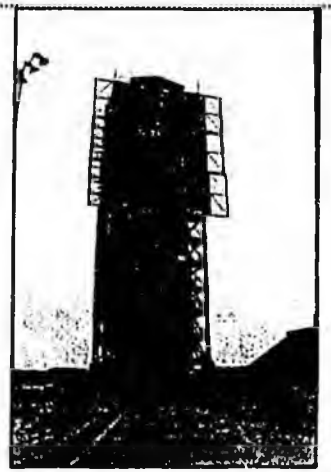
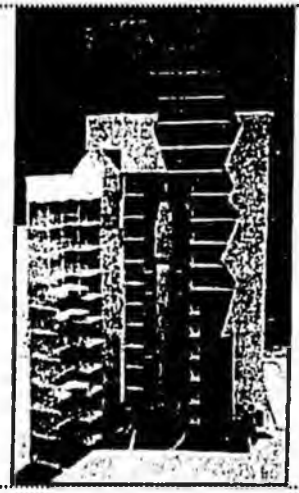
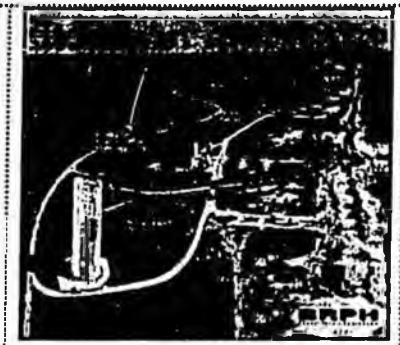
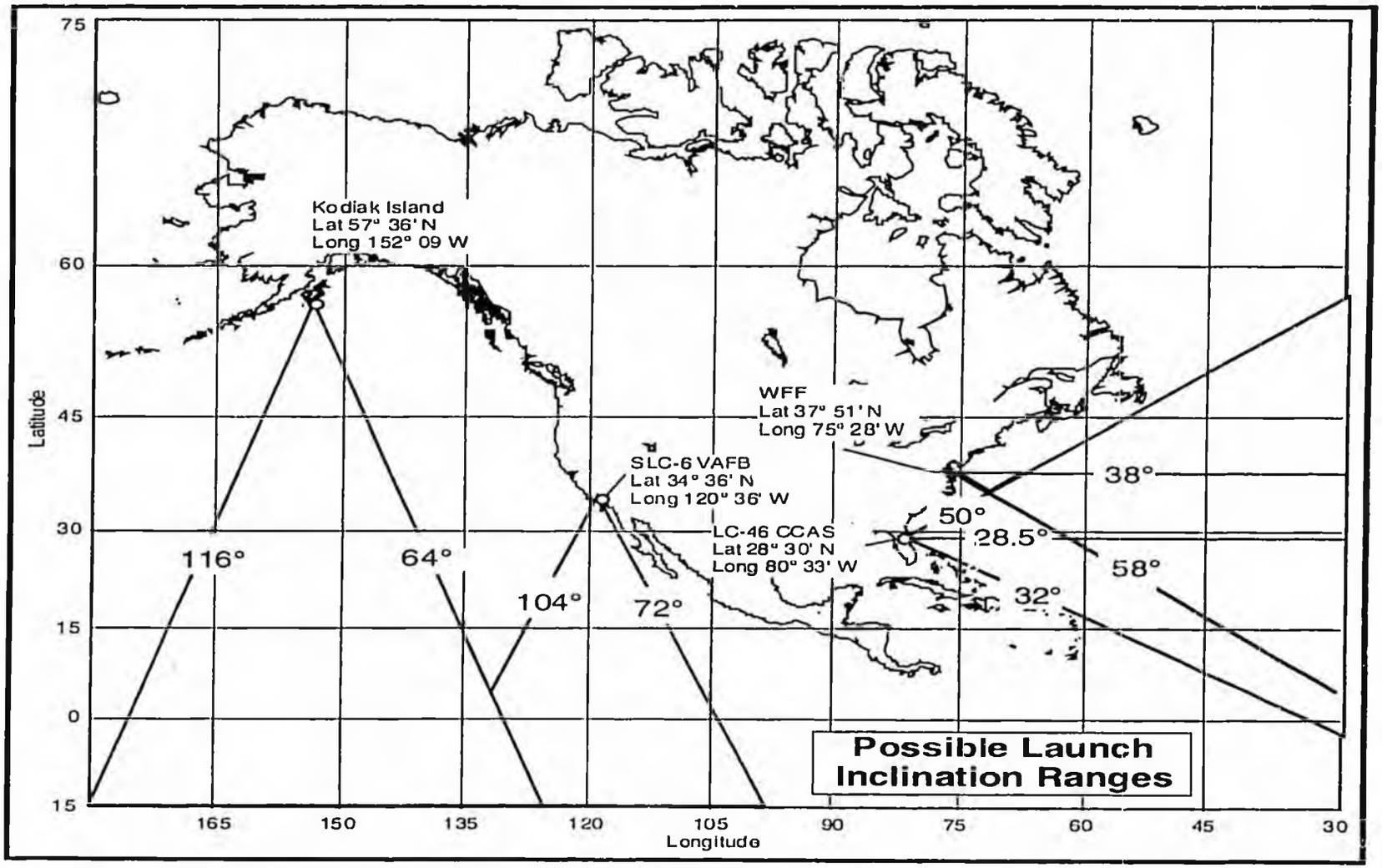
Launch Sites - Current and Future

Athena

			
SLC-6 at VAFB	Spaceport Florida Launch Complex 46	AADC- Kodiak Launch Complex (KLC)	VCSFA Wallops Island Launch Complex-0B
Status Operational Until End of '99	*Status* Operational	*Status* Operational Beginning in 1999	*Status* Operational Beginning in 2000
Inclination Range 70°-104°	*Inclination Range* 28.5°-50°	*Inclination Range* 64°-116°	*Inclination Range* 38°-58°
Processing Facilities IPF or Astrotech	*Processing Facilities* Astrotech	*Processing Facilities* Kodiak Launch Complex (KLC) On-Base	*Processing Facilities* On-Base NASA Facilities
Scheduled Launches: IKONOS 1 IKONOS 2	*Scheduled Launches:* ROCSAT 1 SBIRS-LADS	*Scheduled Launches:* VCL	*Scheduled Launches:*

Athena Provides Full Range of Launch Inclinations



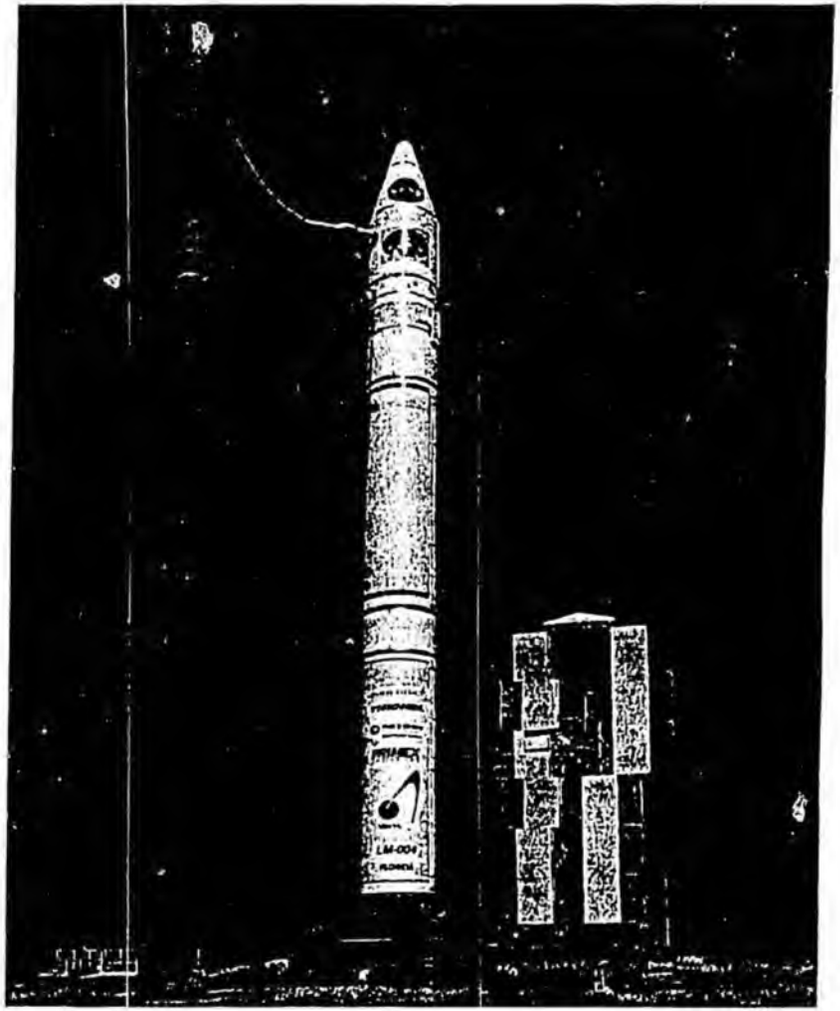
Athena Can Meet The Widest Range of Inclination Requirements

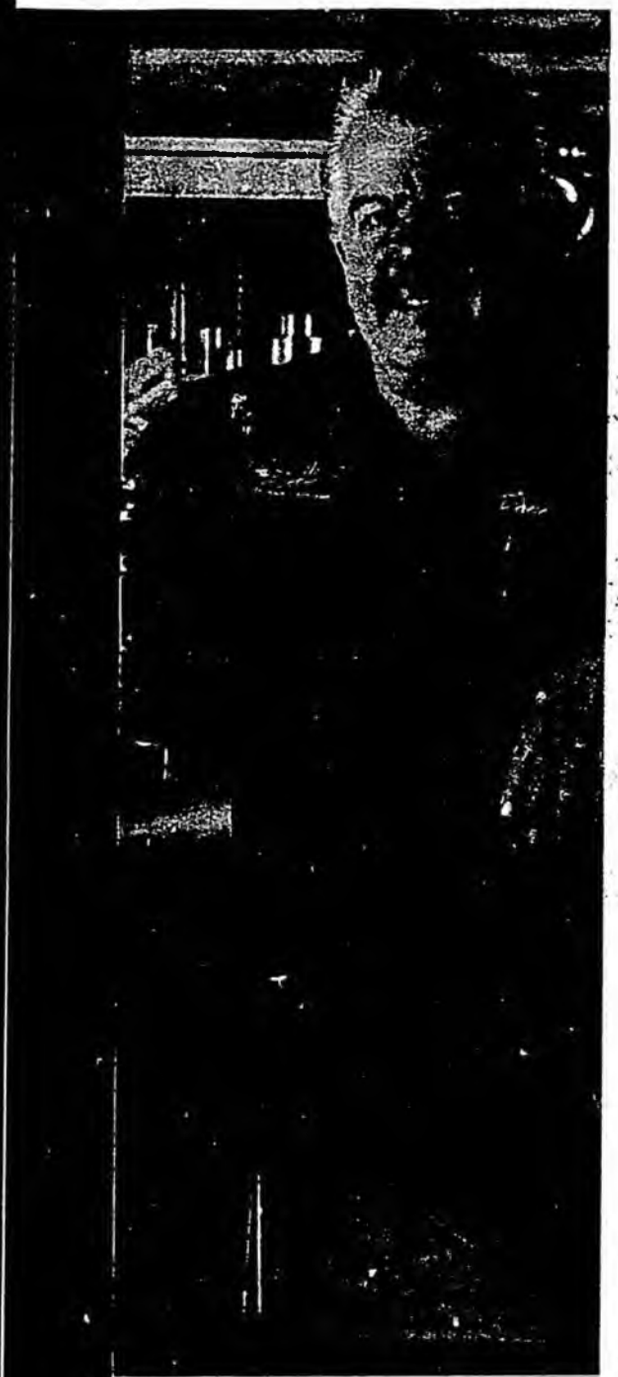
LOCKHEED MARTIN

In Summary

Athena

- Athena Launch System is Operational and Stands Ready to Meet Customer's Launch Needs
- Athena Can Meet The Greatest Range of Launch Requirements
- Athena Provides Complete Launch Service For One Time Price
- Lockheed Martin Commitment To Mission Success Demonstrated
- Athena Provides Reliable and Cost Effective Low Earth Orbit Access





ALASKA SCIENCE & TECHNOLOGY FOUNDATION

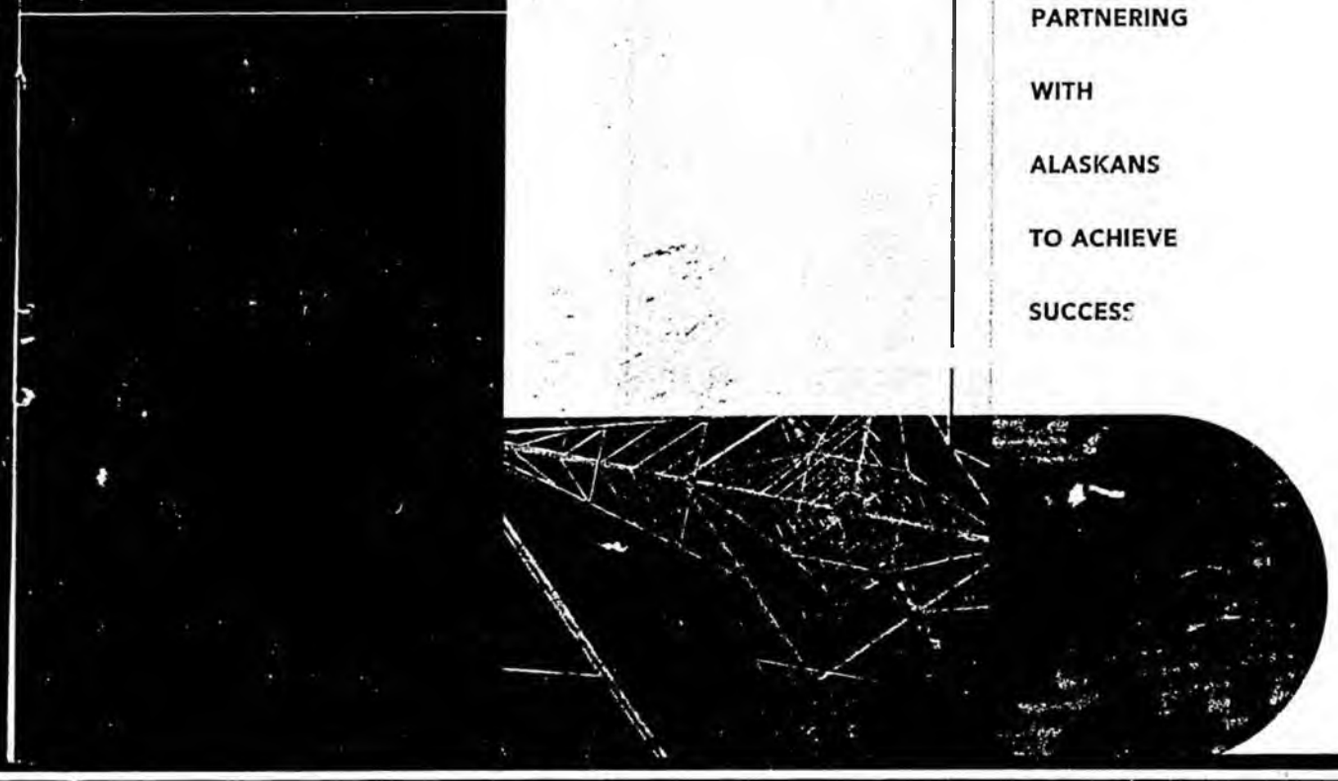
PARTNERING

WITH

ALASKANS

TO ACHIEVE

SUCCESS



THE HONORABLE TONY KNOWLES,
GOVERNOR

THE HONORABLE MEMBERS OF
THE ALASKA LEGISLATURE

CITIZENS OF ALASKA

We are pleased to offer this report on the Alaska Science and Technology Foundation's (ASTF) 1998 operations.

ASTF is having an increasing impact on growing Alaska's entrepreneurial economy. Funded projects in 1998 totaled $13.4 million with a record $64.5 million match.

A McDowell survey of recent grantees reports:

- 100 jobs a year since 1995 have been added by ASTF projects;
- $13 million in additional sales;
- 84 percent report that the project would not have happened without ASTF; and
- more than a third report that they would not be in business without ASTF co-investment in their project.

Since the process from idea to sales takes seven to 10 years for most start-up technology companies, we think this shows ASTF's growing impact on Alaska's future economy.

ASTF would like to credit its partners in business, the university and the community in working with us to develop science and technology for the benefit of Alaskans. Our grantees' willingness to share risk, to develop clear research and development and business plans, and to directly involve end users of the science or technology being developed, are key criteria for both ASTF funds and ongoing success.

The reader of this report will see the impact ASTF is having working with different parts of the state's economy.

Mining

ASTF's work with state regulatory departments and the industry on a simpler test for measuring the impact of total dissolved solids promises to bring better science and more certainty to this key permitting issue. ASTF's work with mining and remote sensing companies on producing maps that integrate the latest technology with existing geotechnical and topographic data has been well received by mining representatives.

Forest Products

In 1998, a lumber grader was stationed in the state as a first step to recapturing the state 70-90 million board feet of imported lumber each year. Seven mills are now producing graded lumber. More mills are undertaking improvement projects and improving the technology and training necessary to compete.

Energy

Working with the resource owners and a long-term marketing focus on selling coal water fuel to Asian utilities, ASTF renewed its $4 million commitment to the coal water fuel demonstration plant being built at UAF. A number of other

ASTF projects aim at using digital technology and alternative energy to bring lower cost electricity to rural Alaska.

Seafood

This summer, Alaska will see the first beta test of an integrated system to remove pinbones from salmon. ASTF investments in the seafood industry continue to exceed other sectors because of the opportunity to apply the latest technology to processing salmon into food and to expand the state's shellfish industry to new markets.

Internet

Most of Alaska's classrooms are now wired to the Internet with the help of thousands of NetDay volunteers, businesses, schools and ASTF's $10,000 per building grants to cover one-time wiring and router costs.

This increased demand and the new federal e-rate program is resulting in improved high-speed connections to Alaskan schools and communities. In the coming year, ASTF will continue to work with communities and schools on integrating the technology into the curriculum and widening the discussion on the appropriate use of the technology. In addition, our work with science museums, schools, and regional economic development organizations will continue so Alaska can realize the full educational and economic promise of being connected.

Thanks

In the coming year, ASTF will spend more time communicating the impact of its work. Part of that task is to offer a clearer picture of the technical and commercial challenges in each industry sector so we can build a broader economic base for the state.

We continue to have the highest appreciation for the foresight and participation of Alaska's political leaders and citizens in our work.

Ron Duncan
Chair

Jamie Kenworthy
Executive Director

James Kenworthy

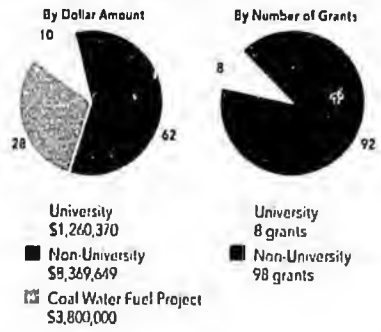
"Value-added" is an easy phrase to say. But it is much harder to fin-
structure the projects that can accomplis
to Alaska's resources. More fun are the entrepreneurs AST
on projects that are adding both economic and socia

Greg Martin Photography

FY98 Funded Projects by Sector

Mining	$ 31,200
Forestry & Wood Products	219,610
Agriculture	277,232
Public Health & Safety	326,919
Environmental	346,000
Teachers	355,036
Sanitation	455,240
Software & Hardware	598,534
Fisheries & Aquaculture	725,987
Science & Engineering Infrastructure	737,671
Arctic Engineering	1,439,610
Internet Connectivity	1,902,237
Energy	2,214,743
Low Rank Coal Water Fuel	3,800,000
Total	$13,430,019

Percentage of Total ASTF Grants



ASTF PARTNERS BUILD INFRASTRUCTURE IN ALASKA

To expand Alaska's economy and to create jobs, students and business leaders need basic tools to perform their jobs. They need access to the World Wide Web for research, networking and sales capabilities; they need to hire employees who are bright, creative and knowledgeable; and, they need to obtain the financing and business management counsel necessary to operate a successful business. During the past year, ASTF was able to provide this type of assistance to help tomorrow's scientists and engineers succeed.

BIDCOs: Risk Capital at Work

ASTF's first experiment with establishing a Business and Industrial Development Corporation (BIDCO) proved successful in its first year of operation. Alaska Growth Capital was established one year ago following $3 million in funding from Arctic Slope Regional Corporation, matched with a $3 million Alaska Science & Technology Foundation loan to offer early-stage financing and technical assistance to small and medium-sized Alaska businesses. A BIDCO makes loans, but unlike a bank, it also can make equity investments in growing businesses and provide technical assistance and management consultant services to client businesses. The formation of the BIDCO was meant to fill a gap in Alaska's financial infrastructure by providing pre-bankable risk capital. In its first year of operation, Growth Capital made six loans to Alaska companies, added $1 million in equity and has been certified by two federal loan programs. The BIDCO also illustrated that it can play an important role in diversifying and supporting the state's entrepreneurial economy. Compared to its original business plan, the BIDCO is ahead of projections on investments and increased capitalization and is on track in helping to expand the state's economic base.

During the past year, Growth Capital approved six loans totaling $1.278 million to:

- Boynton Printing of Barrow for operation of a full-service print shop;
- Wrangell Seafoods of Wrangell for operation of a fish processing plant;
- Scientific Fisheries Systems of Anchorage to help market software and electronic products that enhance fisheries management and harvesting;

and
adding value
is privileged to work with
value to the state.


Greg Martin Photography

- High Priority Services of Palmer to expand computerized building maintenance systems;
- Last Frontier Guest Ranch and Last Frontier Air Ventures of Chickaloon to complete construction of a visitor lodge and develop a heli-skiing operation; and,
- Alaska Canine Cookies of Anchorage to expand production of gourmet pet treats.

In addition to providing direct loans, Growth Capital has attracted $1.25 million of bank financing to deals that might have been perceived as too risky.

The Internet: Alaska's Access to the World

ASTF also is committed to the Internet, which it sees as a digital infrastructure capable of enhancing future education and economic development. In partnership with the Southwest Municipal Conference, ASTF cofunded the Yukon Kuskokwim Delta Telecommunications Forum in September 1997, where education and village leaders discussed the impact the Internet is having on the region. A similar conference was convened in Bethel in December 1997, hosted by the Distance Delivery Consortium and partially funded by ASTF. Both regions are developing web pages to promote the regions' assets, and are identifying local resources that can assist businesses and parents who are interested in how the Internet can expand opportunities in rural Alaska.

ASTF's involvement in education extended to cosponsoring the Science & Society Lecture series in conjunction with the University of Alaska Anchorage. Speaker topics included arctic building, physics, anthropology, whale photography, the human brain and Alaska birds. The series targeted middle school through college students, teachers and the general public to raise awareness and interest in science issues. ASTF also funded Internet wiring and the development of web sites for the Pratt Museum in Homer, Volcano Learning Center in Kenai and the Alaska SeaLife Center in Seward. Science directors said electronic outreach was one way to increase science education, as well as to attract visitors to their facilities.

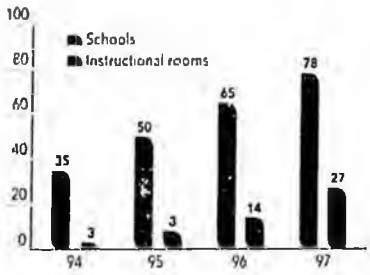
ASTF impact on Alaska's science and math capabilities continued via its teacher grant program. Each year, the agency accepts proposals from K-12 teachers statewide who have exhibited a unique approach to teaching math or science. This program awards funding to cover expenses, travel to attend its

The 1998 ASTF Teachers' Conference

More than 75 of Alaska's most dynamic teachers met in Anchorage in April to show-off their science, math and statistics projects. A workshop on use of the Internet in the classroom was followed by two days of "open house" at the Egan Convention Center. While past conferences showed some teachers had classroom Internet connections, the 1998 conference found that almost all of the participating teachers were connected to the Internet, and that many of their students had constructed a web page to publish their project to the world. Participants ranged from middle school students who showcased a book written and printed on Seward's Plant Life, to an Anchorage Elementary class sharing the creatures and plant life it found in Baxter Bog behind the school. Tustamena Elementary's booth, which allowed young students to try on a NASA space suit and to fly a space balloon, was a popular stop for conference attendees. Satellite tracking of birds, a study on Seasonal Affective Disorder, salmon egg incubation, a Glacier Bay population study and timber regrowth in Southeast Alaska were just some of the topics teachers presented at the 1998 conference.


Greg Martin Photography

ASTF Funds and Alaskan Volunteers Wire Schools to the Internet



Percentage of Schools with Internet Access

The percentage of public schools and instructional classrooms with access to the Internet has been rising quickly, according to surveys of a nationally representative sample of schools between 1994 and 1997.

Reprinted with permission from *Education Week*

ASTF's project to help fund the wiring for Alaska schools to connect to the Internet turned out to be one of the most successful projects in the agency's history. During the past 18 months, more than $4.4 million in ASTF funding has been matched with $8.5 million in cash and in-kind services for the statewide Internet Connectivity project. NetDay Alaska 2000 organized volunteers – including parents, the International Brotherhood of Electrical workers, hundreds of other Alaska businesses, telecommunications companies and students – to connect schools to the Internet.

According to the 1998 Technology Counts report recently published in *Education Week*, approximately 85 percent of Alaska's schools have Internet access and 44 percent of the state's classrooms are wired, which is nearly twice the access rate of classrooms in the Lower 48. NetDay organizers in Alaska have put that figure at closer to 70 percent, and believe Alaska is more than keeping pace with the national directive to have all of the nation's schools and classrooms connected to the Internet by 2000. While ASTF's participation has gone a long way toward making Alaska schools technologically literate, especially compared to the rest of the nation, the state faces huge challenges in the future. Many rural schools lack the higher speed telephone lines and infrastructure necessary to use the Internet effectively. Others lack computers and support staff to integrate technology into skill development and curriculum goals.

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annual teachers' conference and development of school web sites to disseminate project information to others.

This year, the ASTF board approved a record number – 53 teacher grants – after it received the best set of proposals the agency has ever seen. These projects will be implemented during the 1998-99 school year.

Rockets: Launching the State's Space Business

Another project, in which ASTF played a role, will have a long-term economic impact on the state, and particularly the community of Kodiak. Alaskans have been discussing how to get a foothold in the space business for nearly a decade, but this year that dream began to unfold. The Alaska Legislature authorized ASTF to award a $5 million grant to the Alaska Aerospace Development Corporation (AADC), an independent state agency charged with building and operating a rocket launch facility on Kodiak Island. ASTF's grant money was added to federal grant funds: $5 million from the National Aeronautical Space Agency and $18 million in Air Force missile defense money.

Al Grillo

Construction is now underway at Narrow Cape, on the northeast coast of Kodiak Island, and a test rocket already has been launched. When completed, the rocket launch facility will include a 14,000-foot control center, a payload and spacecraft assembly building and a fixed launch pad. Future needs will include construction of a launch tower.

ASTF's investment in the Kodiak launch complex was made after development of a business plan showing that commercial launches could be attracted from private companies seeking polar orbits for telecommunications satellites. With federal funds financing most of the complex, and some military launches committed, the next step for AADC is to attract commercial launches.

SOLUTIONS TO ALASKA'S HEALTH & SAFETY CHALLENGES

Honey buckets, the threat of earthquakes or tsunamis, and the challenges of sharing the same space with wild animals formed the basis of several ASTF coinvestments this year.

Sanitation

Improving village sanitation has been one of the Foundation's highest priorities. A Technology Review Board (TRB) was formed and has been charged with the technical evaluation of wastewater and clean water innovations statewide and the acceptability in local communities. Participants in the TRB included engineers from the Alaska Department of Environmental Conservation, the University of Alaska, U.S. Public Health Service and members from ASTF and Alaska Village Initiatives (AVI). In the coming year, the review board will focus on the provisional permitting of effective and innovative systems. As a first step toward the goal of villages assuming the responsibility of maintaining wastewater systems, ASTF funded a demonstration project allowing AVI to work with the villages of Kipnuk and Kwigillingok in long-range planning for improvement of village sanitation.

ASTF also assisted the North Slope Borough with a $150,000 grant, matched with $440,870 to test a new vacuum valve for sewer systems in four villages. The project involved modifying a vacuum valve design for sewer connections used in warmer climates but operated in Arctic conditions. As a result of the project, officials now know how to design and operate an efficient vacuum sewer system for areas like Pilot Point, where the permafrost isn't very deep.

Bears, Geese, and Iditarod Dogs

Heightened by recent bear maulings, public debate continues to focus on what Alaskans can do to coexist peacefully with bears. ASTF has coinvested $19,846, matched by $22,221, in a project with a University of Alaska graduate student, the Department of Fish & Game and Chugach State Park to define which areas around Anchorage provide key bear habitat. Bears were collared with radio transmitters and a database was developed for analyzing the bears' movements within the Anchorage Bowl. It is hoped that this project will assist

Mapping

Two projects funded in this fiscal year will give scientists valuable information to use if a natural disaster should strike. In 1998, ASTF approved a $668,654, matched with $771,236 to continue a seismic microzonization project with Niren Biswas and the University of Alaska Fairbanks Geophysical Institute. The goal of this project was to determine the earthquake design parameters appropriate for building design and construction throughout Anchorage, and to make that information available to those working in the local engineering and construction fields.

As part of the research, state-of-the-art motion detectors were strategically placed around the city in different zones to correlate periodic tremors with local soil conditions and geology. A Project Review Panel, made up of representatives from the Anchorage Building Safety Department, Division of Emergency Service, U.S. Geological Survey, and local structural and geotechnical engineers, met quarterly to review data and ensure that the project's end product – microzone maps detailing structural requirements in different neighborhoods – would provide maximum benefit to all end-users. This is the largest knowledge grant ASTF has awarded to date.

In June, the ASTF board approved $60,000 in funding to a team of university, state and federal employees to evaluate and map Alaska coastal areas that would be affected by flooding following large earthquakes or landslide generating tsunamis. Mapping is being completed for three communities on Kodiak Island and could be a prototype adapted for other communities.

Clark Mishler

land use planners to map future housing and commercial development around the pattern of bear movements.

Another ASTF grant recipient, McNeil River Enterprises, is waiting for federal approval from the Environmental Protection Agency (EPA) to sell animal repellent pepper sprays. ASTF helped the Anchorage-based company with $20,000, matched with $46,464, to fund laboratory tests required by the EPA. If successful, Guard Alaska spray, in various sizes and dispensers, could be found on store shelves nationwide as one of only two federally approved products of its kind. This company's long-term plans include development of an Anchorage production and packaging facility.

When an Air Force plane crashed at Elmendorf Air Force Base in 1995, killing all on board, Alaskans were reminded of the dangers of a growing geese population. ASTF teamed-up with Peter Scorup, a Palmer resident studying a native Alaskan grass called *Puccinellia arctica*, to determine if the grass repels geese. Scorup, who used to work on Alaska's North Slope re-vegetating areas around the Alaska Pipeline, remembered that this type of grass seemed to repel geese. Using $197,232 in ASTF funds matched by $180,830, several test areas have been planted around Anchorage to see if the grass could be planted at parks, airports and other areas where high concentrations of geese can be hazardous.

ASTF also invested $71,200, matched with $40,200 on an interesting study of Iditarod Trail Sled Dog Race dogs to determine why some dogs suddenly die on the trail. Since 1995, veterinarian Karin Schmidt, and other vets, has been performing electrocardiogram (EKG) tests on sled dogs to detect at-risk dogs and retire them from racing. This study not only could have a life-saving impact on dogs, but it also could help raise the profile of care sled dogs receive during strenuous competition.

Alaska-Based Wood Grader Expands Industry's Potential

PARTNERS IN EXPANDING ALASKA'S WOOD PRODUCTS INDUSTRY

One of Alaska's finest natural resources is its timber, and ASTF has been working hard over several years to fund entrepreneurs who recognize this industry's potential and who are willing to work to expand it.

A McDowell Group study, commissioned last year, found that Alaskans use enough lumber each year to fully support every lumber mill in the state. The report said that on an annual basis the state imports 70 to 90 million board feet of dimension lumber. This is the equivalent to exporting 500 direct jobs in Alaska's economy. It also defined the in-state market for finished and semi-finished wood products and recommended tactics for sawmills and wood product manufacturers to increase sales. ASTF is working with sawmill owners and the Industry Network Corporation on a robust agenda to deliver grading, technical and marketing assistance to take back those 500 jobs.

In December 1997, ASTF awarded Sealaska a $204,385 matching grant to fund a 12-year study to research the best ways to manage plant regeneration in Southeast Alaska's clearcut harvest areas. The study will look at ways higher quality trees can be grown as well as techniques to sustain and improve deer habitat. The project, matched by more than $263,000 in Sealaska funds, is receiving national recognition. One of the principal researchers in the project, Dr. Michael Newton of Oregon State University's School of Forestry, was recently awarded the 1998 Barrington Moore Memorial Award. The award, announced by the National Society of American Foresters, recognizes distinguished individual research in biological science that results in substantial advances in forestry.

Another area showing huge potential is the value-added wood products industry. In pursuit of that, ASTF coinvested $15,225, matched by $28,200, in a mobile dry kiln project with the Mat-Su Resource & Development Council. The group is building a prototype, low-cost mobile dry kiln for lumber production.

Meanwhile, ASTF grant recipient Tyonek Native Corporation and Alaska Wood Products completed its third bridge, produced by a proprietary double-diffusion process using Alaska white spruce. A second mill is now being considered to produce bridge materials and telephone poles for the Interior market.

A major accomplishment for ASTF came in February 1998 when then Speaker of the House Gail Phillips, Lt. Governor Fran Ulmer and Western Wood Products Association (WWPA) President Walter Wirfs announced that a lumber grader would be based in the state. Prior to this agreement, inspectors were flown up from the lower 48 states to inspect Alaska lumber – a practice that was cost-prohibitive for most small sawmills. As well as inspecting lumber, the grader offers advice on how to produce higher quality timber and suggests ways sawmills might be more efficient.

The lumber grader position was part of the Industry Network Corporation's (INC) forest products initiative and was funded by a $200,000 per year ASTF grant, matched by $200,000 in federal funds. Mike McGuigan is WWPA's grader stationed in the state. While his home is in Eagle River, Mike is usually traveling throughout the state visiting mills to grade lumber, train mill employees on grading rules, and consulting on how to improve quality so markets can be expanded. Seven mills are enrolled in the WWPA program, and workshops on producing and buying graded material have been held with buyers and suppliers.

Western Wood Products Association

SEAFOOD AND FISHING INDUSTRY PARTNERS EXPAND PRODUCTS AND MARKETS

In no other industry has ASTF been more active than in fisheries. One of the Foundation's primary goals has been to work with Alaskans improving the uses of Alaska's seafood and fisheries resources. Dozens of ASTF grant recipients, including 10 in the last year, are working to grow the potential of one of Alaska's top resources.

Value-Added: Selling Salmon as Food

Several ASTF grantees have been successful in producing new products and new markets for Alaskan fish, especially salmon. In Auke Bay, ASTF provided $203,400, matched with $140,038 to Zoic Resources. The company developed a freeze-drying technique that is turning hatchery salmon into pet food that sells for as much as $30 per pound. Called WAGS, the cubed, freeze-dried salmon is specially sealed in foil pouches that have a long shelf life and don't require refrigeration. Zoic Resources President Lori Nottingham has been working with the Douglas Island Pink and Chum hatchery in Juneau to use its abundant supply of hatchery brood salmon. In the coming year, Nottingham plans to test market her product and build relationships with distributors who can help her break into the highly competitive pet food market.

Another ASTF-assisted project has worked to increase the purchase of under-utilized Yukon chum salmon. The Yukon Drainage Fisheries Association conducted telemarketing, sent direct sample shipments, attended trade shows and produced promotional materials in an attempt to develop new markets for Yukon River salmon products. This project united several diverse processing interests under one organization to share promotional and market development costs and to identify niche markets for salmon products.

Eight small companies have pooled their resources to form the Yukon Delta Products Association. With the assistance of a $188,750 ASTF grant and $321,670 in matching funds, the group worked on ways to market innovative salmon products nationwide. So far, the Alaska Salmon Marketing Alliance has signed a deal with Spartan Stores for product demonstrations in three upscale Michigan supermarkets and has a tentative deal for kiosks in Dallas and Chicago.

TBRS, Inc.

ASTF Grantees Tackle Pinbone Technology

He's been nicknamed the "Pinbone Wizard," and Ray Wadsworth may soon be one of ASTF's shining examples of how a good idea and hard work can result in a new Alaska fish market. Wadsworth has developed the Total Bone Removal System, the first-ever complete processing solution to remove all of the bones, including pinbones from fresh, wild Alaska salmon. Most believe that consumers would eat more "heart-healthy" salmon if the pinbones weren't such a problem. Wadsworth's invention has received a patent and is being prototype tested and perfected. Plans are to show processors first-hand the efficiency of this system and the marketability for vacuum bagged, fresh salmon filets.

Another grant recipient has taken a different approach to the pinbone problem, aiming at restaurants instead of processors. Larry Kozycki, working with Kodiak's Fishery Industrial Technology Center, recently received second stage federal financing to continue pursuing his invention that could solve the pinbone removal problem.

With some of the Northwest's salmon being shipped to Asia to be deboned by hand before it is brought back to the U.S., Alaska must work to compete by offering a higher tech, higher value product that can be marketed directly to the consumer. If successful, either of these pinbone projects could reduce labor costs and increase profits to the point that value-added salmon products could compete with whitefish and other products in the supermarket.

Expanding the Shellfish Industry

One of the barriers to growing Alaska's shellfish market has been the time required to transport seafood to major markets. Working with Iceberg Seafoods, ASTF invested $227,073, matched by the company's own investment of $210,200, to help test an innovative seawater holding tank that would allow live shellfish to refresh in Anchorage. The hope is this new system will help shellfish better survive air shipping to Asia markets.

One of the fishing industry's most formidable tasks has been dealing with the subject of Paralytic Shellfish Poisoning (PSP). With Alaska's high subsistence rate, and abundance of shellfish, it has become critical to find a way to test and monitor for PSP. In response, ASTF released a Request for Proposals (RFP) asking for studies on the phenomenon and suggestions for how to monitor the problem. Since the RFP was released, ASTF has issued three grants. Gerald Plumley at UAF's Institute of Marine Science received a $19,839 grant, matched with $4,160, to investigate a new method for detecting PSP in Alaska waters. The Bristol Bay Area Health Corporation has been allocated $49,048, matched by more than $66,000, to conduct a community-based PSP testing project near Dillingham. A third grant to Raymond Roberts has been funded by ASTF at the $91,704 level, matched with $124,010 to develop an on-site beach and laboratory testing kit that could be used to determine if shellfish are safe for consumption. ASTF continues to seek good ideas on ways to manage the PSP problem.

Technology to Manage the Resource

ASTF grant recipients also are working to help fisheries managers continue to base their decisions on sound data. Pat Simpson of Sci Fish has developed The Fisherman's Associate, a geographic information system that maps fishing regions and helps fishermen reduce bycatch. Simpson also has developed a patented, broadband sonar fish identification system.

ASTF assisted with the funding for a University of Alaska and Department of Fish & Game test using sonar to estimate fish returns in rivers. Software developed under this project could lead to new products in fisheries acoustics.

Mark Kelley

ASTF BUILDS VALUABLE PARTNERSHIPS WITH ENTREPRENEURS

Being an Alaskan often means having an "I can do attitude." Several of the inventors and entrepreneurs ASTF has worked with in the last year reflect that attitude. From ginseng to all-track vehicles, Alaskans seem to have a knack for taking a good idea and coming up with new products and businesses.

Take Kerry Snare and Kirk Studebaker of Chinook Manufacturing who have invented an all terrain vehicle called the Jager. The vehicle travels cross-country with minimum impact and can be adapted with skis or wheels on the front. With a direct appeal to hunters, geophysical workers and emergency response personnel in Alaska's Bush, Chinook already has received several orders for its unique machine and is working toward mass production.

ASTF grant recipient Randy Brand of Fairbanks also continues to pursue his idea, which will lead to less risk of fuel spills on boats. Brand's company, Denali Corporation, has received a patent and is producing prototypes of a marine fuel discharge prevention device that can be used on a boat. The device simply fits onto the boat gas tank and fill spout, and keeps any fuel from spilling during refueling.

Ginseng is the most profitable, sustainable agricultural product grown in North America, valued at $120,000 per acre at harvest. To David Smith of Anchorage, ginseng is an opportunity for Alaska waiting to be developed. With $213,000 of his own money and assistance from a 1997 $80,000 ASTF grant, Smith is looking at how wild ginseng might be Alaska's next promising agricultural product. Working with the Plant Material Center in Palmer and the State Division of Agriculture, Smith's ginseng plants have grown better and are more cost-effective than even first anticipated. Smith has learned that there are more than 20 ideal sites for growing ginseng between Pt. McKenzie and Trapper Creek. Smith is on his way to developing a new high-value product in Alaska. He has now filed for more than $150,000 in U.S. Department of Agriculture grants and is in contact with ginseng growers worldwide. In a few short years, Alaska could be competing with Canada as the number one exporter of American ginseng to Pacific Rim countries.

Chris Arend

Leading Edge Exhaust System Business Takes Off

After repairing Cessna airplanes for several years in Alaska, Dane Wagner knew there had to be a better way. Again and again he saw failed exhaust systems requiring costly repairs. So Wagner decided to take the matter into his own hands. With the help of a $176,426 ASTF grant, Wagner threw in $437,778 of his own money and in-kind services to successfully develop a new exhaust system that corrects what he believed to be design flaws. Wagner said that by using state-of-the-art mandrel tube bending technology, the new exhaust system design would result in a balanced system that reduces engine back-pressure and noise levels and would yield an extended product life.

Wagner's company, Leading Edge Exhaust Systems (LEES), announced in August 1998 that it had received a patent, certification and Federal Aviation Administration approval to sell the new exhaust system. The company plans to concentrate on Alaska sales for the first year, then hopes to expand nationally. LEES estimates that more than 1,600 exhaust system units are repaired on Cessna 205 to 210 series aircraft each year. The company hopes to capture 14 percent of that market in its first year.

"Part of ASTF's mission is to help turn good ideas into viable businesses, so we're thrilled to see LEES making it through the manufacturing stage and to a point where it is selling product," said Jamie Kenworthy, executive director of ASTF.

From Trash to Treasures

Three other ASTF grantees have come up with innovative businesses turning throw-away items into valuable products.

Fairbanks: Interior Alaska Green Star, working with the Fairbanks Chamber of Commerce, received $80,000 in ASTF support, matched by nearly $46,000, to recycle glass into decorative glass tiles. The group is looking at different ways to crush and process glass, fuse it and turn it into value-added products such as decorative tile. The project plans to hire disabled workers, creating important new jobs for area residents.

Anchorage: John Dean, who is one of ASTF's most well-known partners through his work in building the Anchorage Regional Composting Facility, is now developing another new industry in Anchorage. ASTF has invested $266,000, matched with $235,600 to help Dean design, fabricate and assemble a recycled glass processing plant. Dean's plan is to turn glass, which is currently not being recycled in Alaska, into fine, sandblasting material and other retail products. Dean already has identified a market and a distribution partner for his products, and is developing a unique glass crusher system that in itself could be sold to other companies.

Sitka: ASTF also continues to facilitate the potential for composting in Alaska. ASTF coinvested $137,538, matched with $26,666 with Sitka Tribal Enterprises to develop and operate a composting facility in Sitka. This project, which partners the tribal group with Ketchikan Pulp Company, Sitka Sound Seafoods and the Northern Southeast Regional Aquaculture Association, is working to make an organic, soil-like compost from fish and timber waste. The pilot project is being developed on property owned by the City and Borough of Sitka, and will result in a variety of products being sold under the Alaska Earth Works product name.

The close working relationship each project has within the community shows these grantees' interest in both business development and avoided landfill costs.

ASTF has gathered an informal group of individuals to make sure that knowledge on composting, equipment, practices and regulations is shared statewide.

PARTNERS IN MINING AND ENERGY RESOURCES

Developing Alaska's Coal

Alaska has immense reserves of low-sulfur coal that could fuel new natural resource processing industry. Working with the University of Alaska Fairbanks (UAF), ASTF agreed to coinvest $4.25 million in a project with the UAF to develop a demonstration project of coal diesel technology using Low Rank Coal Water Fuel (LRCWF). The ASTF, UAF and Usibelli Coal Mine funds were necessary to complete the match for the $20 million in Department of Energy (DOE) cash to finance the demonstration plant. Part of the ASTF grant will go toward market research to assess the potential market for tidewater Beluga coal to compete with fuel oil in the expanding Asian market. DOE funds will be used to operate the plant beginning in January 2000 using LRCWF in diesel engines to produce electricity for the UAF campus.

ASTF and its partners hope the demonstration project will prove the economics for the production and use of LRCWF. If successful, it also will show that electricity can be reliably produced by diesel engines using coal-derived fuel. The project includes assessing the impact on LRCWF on the marine environment, and, in cooperation with state trade and infrastructure funding agencies, will examine the issues and investments necessary to make the export of tidewater coal a reality by 2005.

Harnessing Tidal Power

In another project to research Alaska's unique potential for energy resources, ASTF and the Alaska Division of Energy helped to fund a study on the feasibility of a prototype tidal power plant in Cordova. Peter Ullman's Tidal Energy of Alaska, Inc. (TEA) has researched locations where the ocean tides can be used to generate power around the world, and believes that Alaska is a prime location for such innovation. TEA also will look into possible partners for making a tidal power plant, estimated to cost about $14 million, a reality in Alaska.

Desulfurization Technology

With assistance from a $403,000 ASTF grant, matched with $879,735, Alaskan crude refinery operator Petro Star is continuing its work to develop a

process for removing sulfur from diesel fuel produced in Alaska. Sulfur removal processes are too costly for smaller refineries, such as those in this state. But if Petro Star is successful, small to mid-size refineries could expand their markets by having the ability to sell low sulfur diesel fuel. Petro Star's vision for this project includes a future pilot plant to produce low-sulfur diesel – the first step to building a full-scale facility.

Monitoring Technology Saves Money

Work continues on a grant to Distributed Systems, LLC to develop its IED 2000/GenMan Software. The product being developed through this ASTF-funded project is a system to remotely monitor and control power generation systems in rural Alaska. Much of the discussion about this grant has focused on the financial woes of Distributed Solutions' affiliated company, Alaska Power Systems, and on the overall debate about how power is now provided in rural Alaska. ASTF still holds an interest in the GenMan technology, which continues to be developed for the worldwide market as a promising technology to reduce power costs in remote areas.

Making natural resource extraction safer and more efficient also is of interest to ASTF. The Foundation has granted $20,000 to K2 Technology, matched by $57,171 of the company's money. The grant aims to develop software to manage non-destructive test inspection data on pressure vessels, tanks and pipelines in Alaska's petroleum industry.

Remote Sensing Tools Assist Mining Exploration

Another promising project for the mining industry is one that will demonstrate how new and declassified remote sensing techniques can be used in mining operations. Working with AeroMap U.S. of Anchorage, the Department of Natural Resources and Fairbanks Gold Mining, Inc., ASTF provided $396,390, matched with $292,817 to fund a project that will show mining companies how to use information that integrates the latest remote sensing techniques with geotechnical information and topographic information. Sample products, reviews and results of the surveys will be included on a CD-ROM that will be made available to mining companies statewide.

Industry and Regulators Work to Improve Water Quality

One of the big challenges to Alaska's mining industry is minimizing the effect mining has on the environment. ASTF is working with two grantees to provide the science base required to establish appropriate water quality standards.

One project involves a number of agencies working together including the Council of Alaska Producers, the Department of Environmental Conservation (DEC), the Alaska Department of Fish & Game and the Environmental Protection Agency. Using $13,200 in ASTF funds and matching it with $13,370, the project is designing and researching the agenda required to determine the effects of Total Dissolved Solids (TDS) on fish and related aquatic life. The results of this project will provide DEC with data useful in evaluating regulations governing TDS limits.

ASTF also has coinvested in a water quality project to examine water quality on the Fortymile River. During the summer of 1998, water samples were taken from the Fortymile River that will distinguish the turbidity resulting from dredge operations from background data caused by the stream's natural dynamics.

Greg Martin Photography

Greg Martin Photography

ASTF'S ENTREPRENEURS HONORED IN 1998

As ASTF's grant recipients commercialize their products and build their businesses, they are attracting the attention of local, state and federal organizations. During the past 24 months, two ASTF projects have been awarded the prestigious Tibbetts Award for technological accomplishment. The Tibbetts award is given to companies that receive federal Small Business Innovation Research (SBIR) funding.

Most recently, the Alaska Technology Transfer Center was honored with a Tibbetts Award. For the past three years, ASTF has supported Charles Christy's work to provide assistance to small Alaska businesses applying for SBIR funding or needing database searches on technical issues. Until only a few years ago, Alaskans rarely applied for SBIR funding and few were awarded. But in the last few years, more SBIR funding is being awarded to in-state projects.

Engineer Dennis Nottingham of the Anchorage firm Peratrovich, Nottingham and Drage, Inc. is another ASTF grant recipient receiving kudos this year. ASTF assisted Nottingham several years ago with preliminary work in designing a wave barrier superior to anything else built in Alaska. After several years of refinement, Nottingham received the 1998 NOVA Award for his "open-cell" bulkhead innovation. The NOVA Award is presented by the Construction Innovation Forum in recognition of revolutionary construction innovations that improve quality, efficiency and cost-effectiveness. More than 70 "open-cell" structures have now been built for uses including bridge abutments, docks, erosion control, oil spill containment and weirs. The cost of "open-cell" docks is typically one-fourth less than other bulkhead types and less than half the cost of equivalent platform docks.

On November 23, 1998 the Journal of Alaska Business and Commerce and the Anchorage Chamber of Commerce named the first class of "Alaska's Top Forty Under 40" that honors young professionals making headlines in business fields. Lori Nottingham of ZOIC Resources, Rick Lee of Integrated Power Technologies, Eden Larson of Larson & Associates, and Kirk Studebaker of Chinook Manufacturing are four ASTF grantees recognized, along with others, for their commitment to business growth, professional excellence, personal integrity and leadership.

Oct. 11, 1998 ANCHORAGE DAILY NEWS Section C

Oil Funds Aid Many Projects

Foundation Spurs Innovative Efforts

Alaska has done some smart things over the years – believe it or not – with its money from North Slope oil royalties and taxes.

The $22 billion Permanent Fund is one case in point. So is the alphabet soup of independent state corporations given an endowment of oil money, such as Alaska Housing Finance Corp. and Alaska Industrial Development and Export Authority. These now make valuable contributions to the state's economy.

To that list let's add a lesser-known agency, the Alaska Science and Technology Foundation. This was created in 1988 with an endowment of $100 million. Investment earnings, about $9 million this year, are used to finance a wide variety of technology projects.

Unlike AIDEA, whic finances major development projects where risks are minimized, the Science and Technology Foundation's mission is to tackle the risky projects, to take on the entrepreneur or the inventor with a sound idea but whom no bank would touch.

Being risky doesn't mean these are blue-sky pipe dreams, though. ASTF's board has some level-headed businessmen and in recent years the foundation has required that projects it funds have a marketing plan – that they are economically relevant.

Meanwhile, the sheer scope of the projects undertaken by the foundation is impressive.

There are the large projects, partnering with other agencies and industry to help create the new space-launch business for Alaska (a Kodiak launch facility is now built), or the new coal-water fuel technology that will widen markets for Alaska coal developers (a demonstration plant is under construction in Fairbanks).

The smaller projects are just as meaningful. ASTF is working with inventors of a new machine that could economically remove pinbones from pink salmon. Processors now either leave these bones in the salmon or remove them by hand, and if a mechanical way was found to do it, pink salmon could be used in a wide variety of new products.

ASTF is also working with an Alaska aerial mapping firm developing new remote sensing systems to map potential mineral deposits, and with a group of mining companies on a simple, inexpensive test to measure suspended solids in water.

The latter project could cut a lot of hassle for mining companies and contractors that deal with government agencies on water-discharge permits.

Another small project will help small sawmills get dimensional lumber certified and graded so Alaska wood can be used in government construction, and used in places with strict building codes. Now, lumber is being brought in from other states. ASTF is working with the Western Wood Products Association, a western state trade group, to bring a specialist to Alaska to grade local lumber and work with local mills in upgrading their capabilities.

A better-known project is ASTF's $5 million effort to hard-wire over 500 Alaska schools around the state, about 7,000 classrooms in all, for access to the Internet. Without that access many of our children would remain in a technological stone age.

The foundation has a good track record, but in past years state legislators have made periodic runs on ASTF, hoping to divert its endowment to their own pork projects.

There hasn't been a serious attempt at a raid for several years now, and that's mainly because the foundation has done a good job of building constituencies, like the mining industry, to support its mission.

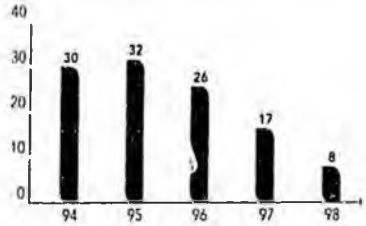
I like to think our ASTF is special, but in fact almost every state has something like it.

Some have much bigger endowments. Even on a per capita basis, where thinly-populated Alaska should score well, we rank in the middle of the pack in state support for research and development projects.

This is money well spent, though. These are seeds being planted to grow businesses and industries with new technologies. These will bring new jobs that pay well. It's the best kind of economic development.

by Tim Bradner. Reprinted with permission from the *Anchorage Daily News*

Operating Costs as a Percentage of Total Expenditures



ASTF operating costs include both administration and technical assistance to grantees and others. Expenditures do not include matching funds of applicants, industry, agencies, and in-kind support of ASTF projects

FISCAL YEAR 1998

FUND BALANCES – Year Ending June 30, 1998	
Principal	$ 101,113,000
Earnings	14,455,000
Total Fund Balance	**$ 115,568,000**
EXPENDITURES OF ASTF FUNDS – Year Ending June 30, 1998	
ASTF	
ASTF Grants	$ 12,512,527
ASTF Operating Budget	1,109,182
Total	**$ 13,621,709**
LEGISLATIVE APPROPRIATIONS OF ASTF EARNINGS	
UAF Agriculture	$ 2,610,000
Alaska Aerospace Development Corporation	$ 503,200
Department of Commerce and Economic Development	480,000
Total	**$ 3,593,200**
Total Expenditures of ASTF Earnings	**$ 17,214,909**

FISCAL YEAR 1999

PROJECTED USAGE OF ASTF EARNINGS	
ASTF	
ASTF Grants*	$ 7,714,200
ASTF Operating Budget*	1,283,000
Low Rank Coal Water Fuel	3,800,000
Total	**$ 12,797,200**
LEGISLATIVE APPROPRIATIONS OF ASTF FUNDS	
UAF Agriculture	$ 2,630,000
Alaska Aerospace Development Corporation Operating	557,600
Total	**$ 3,187,600**
Total Projected Usage	**$ 15,984,800**

* FY99 Budget Appropriations

Richard K. Strutz, Treasurer

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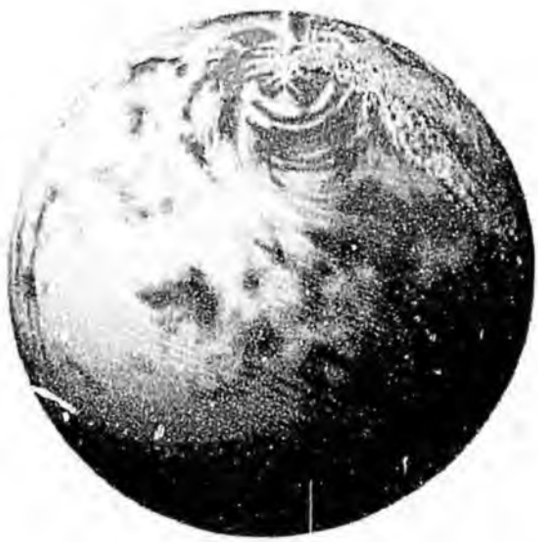

1999

business plan

alaska aerospace development corporation

2/25/99
Attachment 3

Inaugural Launch of ait-1 at the Kodiak Launch Complex, November 5, 1998.

1999

business plan

alaska aerospace development corporation

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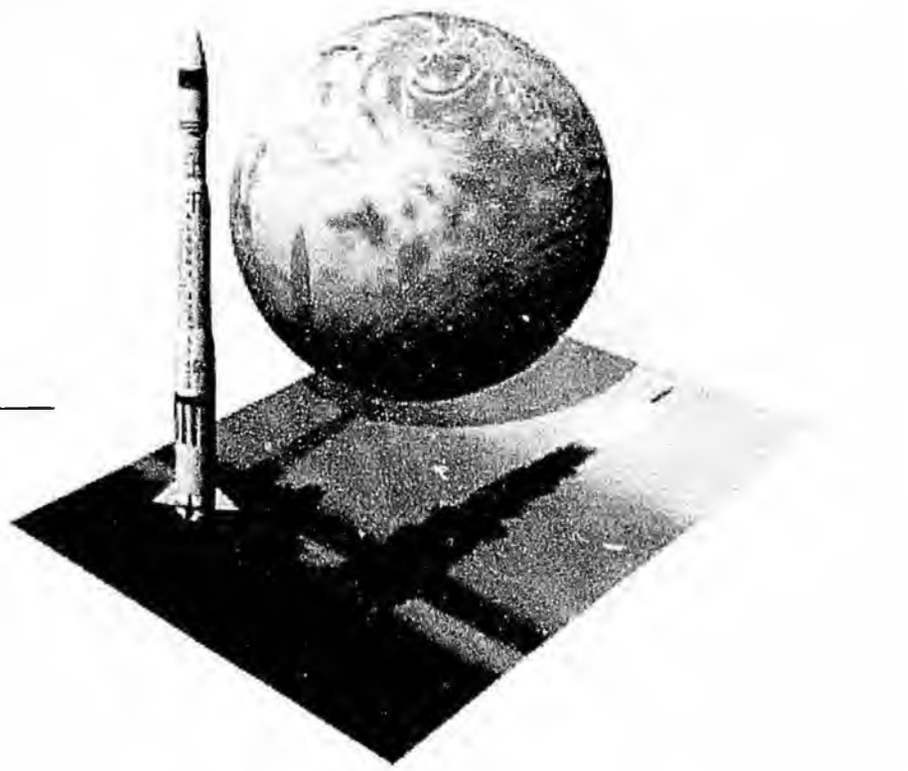
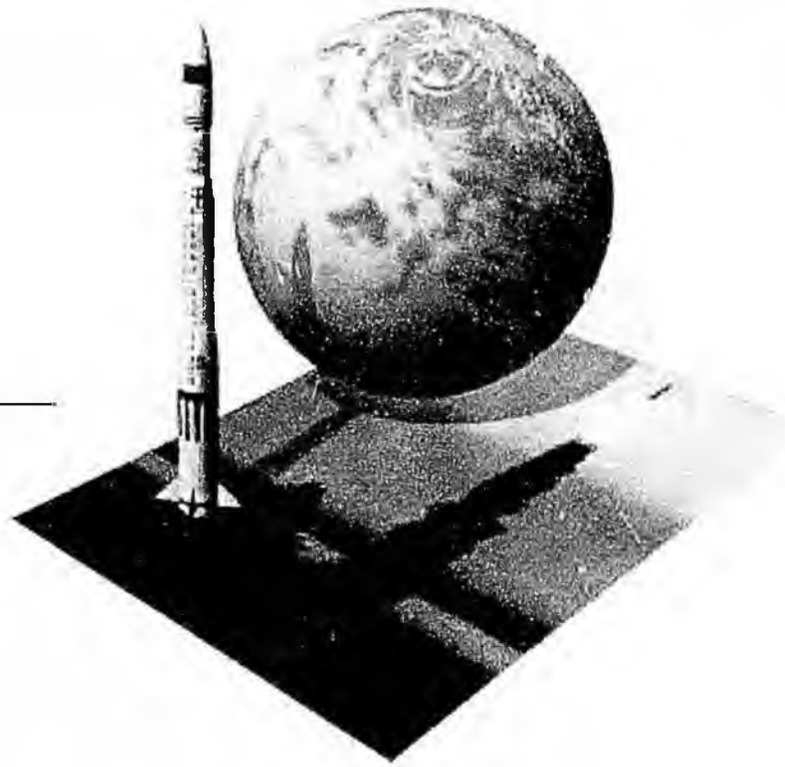


mission statement

The mission of the Alaska Aerospace Development Corporation (AADC) includes establishing and operating, in Alaska, a commercial launch facility promoting aerospace-related economic growth and developing corresponding technologies and support services. Concurrent goals are to strengthen the Alaskan technological infrastructure, assist in advancing science and engineering research and aerospace in polar disciplines at the University of Alaska, attract space-related businesses from outside the state to locate in Alaska, support tourism activities at Poker Flat Research Range, and stimulate public advocacy for the enterprise.



executive summary

The Alaska Aerospace Development Corporation, a public corporation of the State of Alaska, was established in 1991 to develop Alaska based economic and technical opportunities in the aerospace industry. In pursuit of this goal, AADC's primary objective is to develop a commercial spaceport in Alaska. The Kodiak Launch Complex (KLC) is currently under construction on 3,100 acres of state-owned land at Narrow Cape, Kodiak Island. Narrow Cape is an ideal location for launching small satellites into polar, high inclination and Molniya orbits. The development of the KLC has been supported and encouraged by the State of Alaska, NASA, the Air Force, the communities of Kodiak Island and private aerospace companies.

With approximately 40% of the construction effort complete, the Complex has already made a significant impact on the economy. Utilizing temporary infrastructure, the KLC celebrated its first mission on November 5, 1998 with Orbital Sciences Corporation's launch of a sub-orbital vehicle called Atmospheric Interceptor Technology (ait-1) for the U.S. Air Force. The launch of the modified intercontinental ballistic missile was designed to test the Air Force's ability to detect incoming missiles. Sixteen minutes after lift off, the rocket landed in the Pacific Ocean 300 miles west of Seattle. The inaugural launch generated significant in-state revenues from launch operations and supporting activities. According to the University of Alaska Anchorage, Institute of Social and Economic Research (ISER), the AADC's inaugural launch injected $1.3 million dollars into the state's economy. Kodiak benefited directly as the launch provided a $700,000 gain to its economy. Anchorage fared nearly as well with a $600,000 gain.

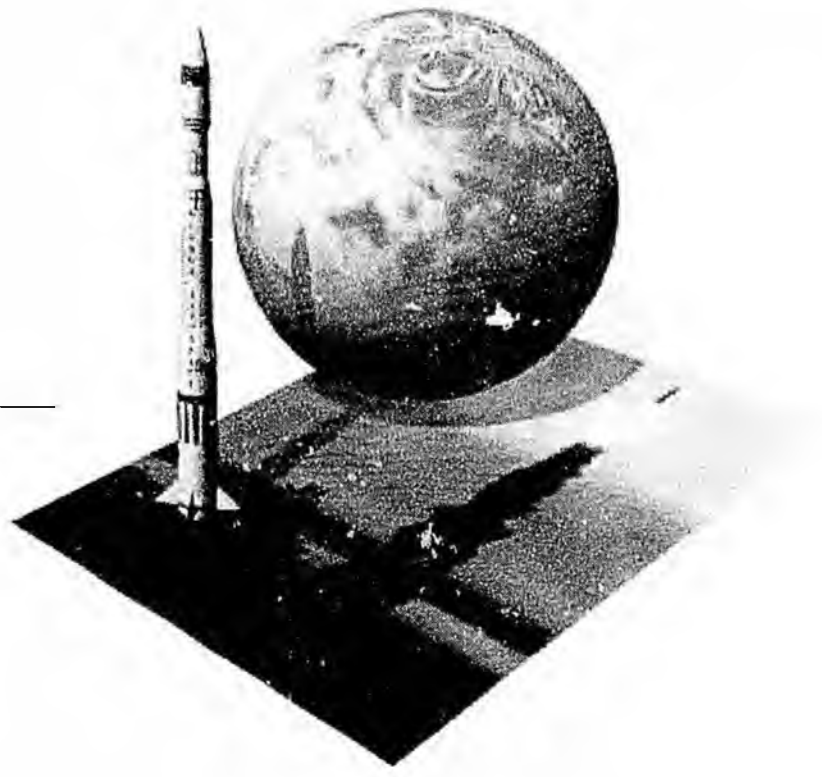
The development of the KLC represents a positive contribution to the launch infrastructure needs of the United States and the ability of U.S. space launch and satellite industries to meet the challenges of growing international competition. The need for additional launch facilities is evident by the finite capacity available at federal launch ranges currently supporting DoD, NASA and commercial requirements. An increase in national security requirements could place demands on the DoD ranges that would severely restrict the use of those ranges by the commercial sector. Thus, the KLC will contribute to "assured access" to space for

high inclination, low earth orbit and polar missions. The KLC will also provide a platform for commercial launch services creativity without sacrificing safety. Operating procedures will be innovative and target commercial users.

As of January 1999, AADC has received nearly $28 million from state and federal sources for construction of the KLC. At present, AADC is awaiting legislative approval to receive and expend $7,000,000 in federal funding and is seeking an additional $5,000,000 funding component to complete the construction of the KLC on schedule.

In addition to developing the KLC, AADC has also targeted the satellite ground station segment of the aerospace market. AADC's facilitation of ground station development in Fairbanks has been key to the Corporation's success and to the state's overall efforts to date. Since the ground station effort at Fairbanks has been privately funded outside of the AADC organization, it is appropriate that the bulk of this plan addresses the KLC in order to facilitate budgetary approval and complete the construction effort.

As AADC moves into the 21st century, the Corporation plans to maximize launch opportunities which are essential to the success of the Kodiak Launch Complex. Additionally, AADC hopes to capitalize on Alaska's strategic location and explore all potential aerospace development opportunities throughout the state.



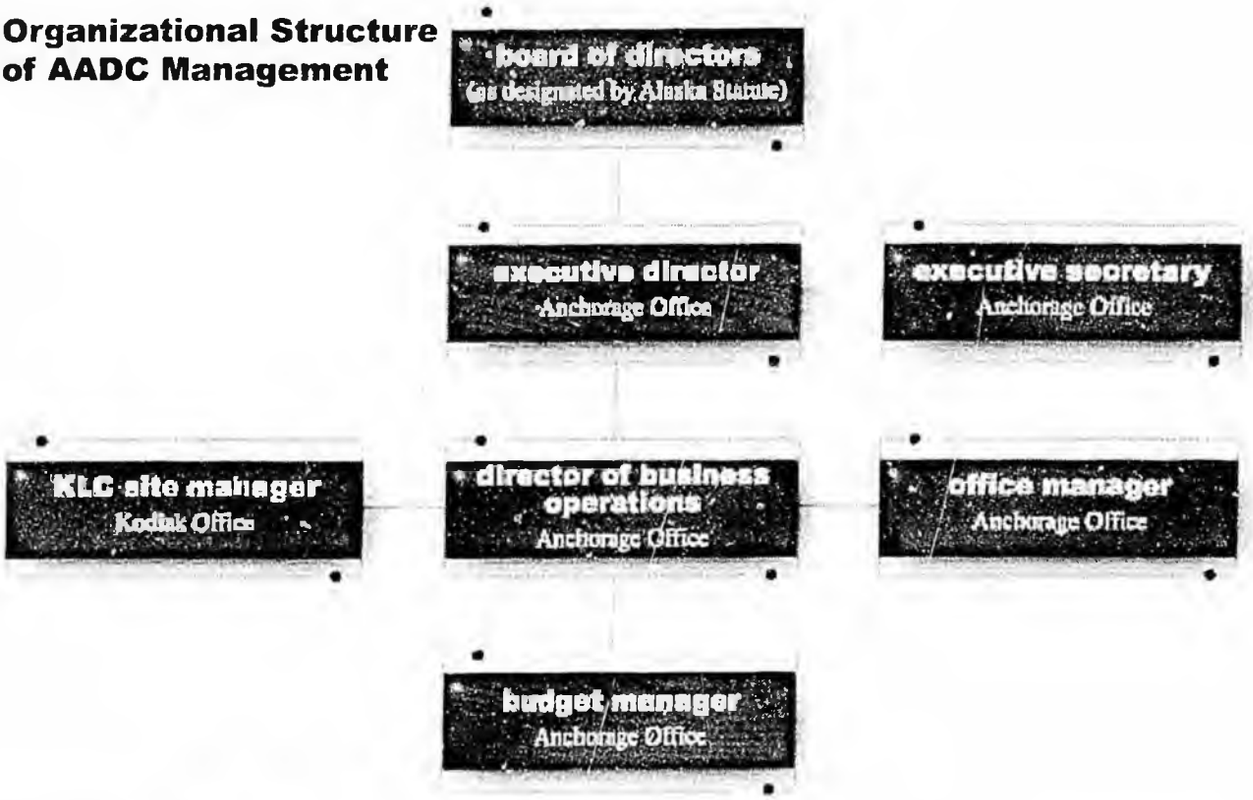
overview

History

The Alaska Aerospace Development Corporation is an agency of the State of Alaska, established in 1991 by Alaska Statute 14.40.821 to promote development of the aerospace industry in Alaska. AADC is a public corporation located for administrative purposes within the Department of Commerce and Economic Development (DCED) and is affiliated with the University of Alaska (UA). AADC's budget is subject to legislative appropriation and has been funded from interest earned by the Alaska Science & Technology Foundation (ASTF) on its endowment as well as corporate receipts.

The legislative history and language of AADC's enabling statute underscores the primary mission of AADC: to establish a commercial spaceport in Alaska. Additionally, AADC recognized the potential significance of developing a satellite ground station industry in Fairbanks and has pursued simultaneous development of that effort. These two primary activities have the potential to generate significant economic benefits and contributions to the State of Alaska. As commercial space launch and ground station activities have expanded, AADC has identified other opportunities for the state. The opportunities are discussed in the Strategic Planning Section and offer a platform from which AADC can further develop Alaska's participation in the aerospace industry.

Organizational Structure of AADC Management



Board of Directors

AADC's Board of Directors consists of nine regular members appointed by the governor or designated by statute as follows: three state residents who have a significant high level of experience in the private business sector, specializing in financing or economic development or marketing; the President or the designee of the President of the University of Alaska; the Director or designee of the Director of the Geophysical Institute of the University of Alaska; the Commissioner of the Department of Commerce and Economic Development or the Commissioner's designee; two members who have held or currently hold positions in the aerospace or commercial space industry or special experience regarding federal regulatory procedures and policies involving space or operational experience; and a public school educator or a public member. The Board of Directors selects a chair and vice-chair from among the members who are state residents. Additionally, three ex-officio nonvoting members of the Alaska legislature currently serve on the Board.

Michael Machulsky, Chair
President, Buskin River Inn

Deborah Sedwick, Vice-chair
Commissioner, Department of Commerce and Economic Development

Rep. Alan Austerman
Alaska State Legislature (Kodiak)

Dr. Syun Akasofu
Director, UAF Geophysical Institute

Captain Eugene A. Cernan
Chairman /CEO, Johnson Engineering Corporation

Mark Hamilton
President, University of Alaska

Senator Drue Pearce
Alaska State Legislature (Anchorage)

Henry Penney
General Manager, Penco Properties

Courtney Stadd
President, Capitol Solutions

Rep. Gene Therriault
Alaska State Legislature (Fairbanks)

Dave Woodruff
Vice President, Alaska Fresh Seafoods

Connie Yoshimura
President, Fortune Properties

AADC is managed by an Executive Director selected by the Board of Directors. Pat Ladner was hired as AADC's first executive director in 1992 and continues to lead AADC. Mr. Ladner has an extensive background in managing military launch services. He retired as a Lieutenant Colonel from the Air Force, where during his 23 year career he served as the Director of Strategic Defense Initiative Organization (SDIO), Test Operations, Missions Director for SDIO's LOSAT mission, Deputy Mission Director for the Delta Star Launch, and the first program director of the Single Stage to Orbit prograra.

Contractors and Consultants

AADC has worked with the following key contractors and consultants to provide the appropriate industry expertise to ensure the successful development and completion of the KLC.

Project Management Consultant, RISE Alaska, LLC

Construction Administration, BRPH Architects - Engineers, Inc.

Design Consultant, BRPH Architects - Engineers, Inc. and Tryck, Nyman Hayes, Inc.

Safety Consultant, Research Triangle Institute (RTI)

Environmental Consultants, Tetratech (*formerly Brown & Root Environmental*) and The University of Alaska – Anchorage, Environment and Natural Resources Institute (ENRI)

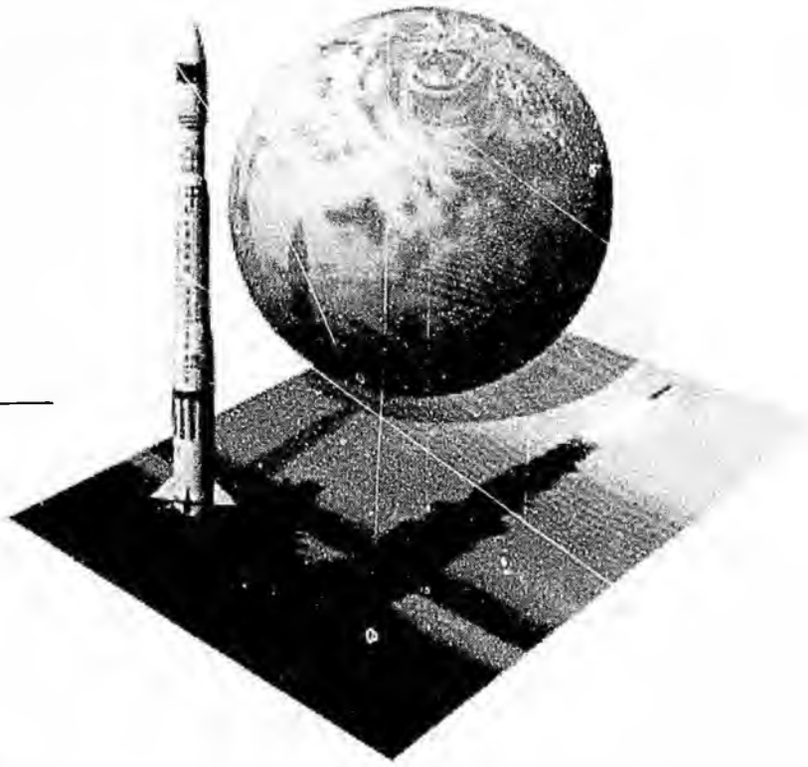
Aerospace Market and Cost Consultants, KPMG /Peat Marwick Space Consulting Group; Teal Group Corporation; Lockheed Martin; IIMS Inc.; FAA, Office of the Associate Administrator for Commercial Space Transportation (AST); and the Commercial Space Transportation Study

Legal General Counsel, Birch, Horton, Bittner & Cherot

Feasibility Consultants, Alaska Industrial Development and Export Authority (AIDEA)

Summary of AADC Development 1992 to 1998

A 1992 analysis prepared for the Alaska Industrial Development and Export Authority (AIDEA) found that an orbital launch facility in Alaska was feasible and could make significant contributions to the state. In the fall of that year, the offices of AADC were established in Anchorage with the hiring of the Executive Director. AADC's first efforts were focused on development of an orbital launch capability for the State of Alaska and identification of other potential aerospace related development efforts. By 1993, AADC also began marketing Fairbanks as the ideal location for satellite ground stations and initiated outreach programs to that effect. In early 1994, the AADC Board of Directors selected Kodiak as its site for the orbital launch complex and the Corporation began focussing the majority of its efforts on developing the Kodiak Launch Complex. Through 1995 and 1996, AADC continued garnering industry, financial and government support for the KLC, while simultaneously managing the development of the satellite ground station development in Fairbanks. By 1997, AADC had achieved success in both of its target areas by obtaining significant sources of funding for the KLC and facilitating commencement of ground station operations throughout Fairbanks. With the advent of 1998, AADC began construction at the KLC. By November of that year, AADC successfully launched its inaugural launch mission utilizing temporary infrastructure at the KLC.

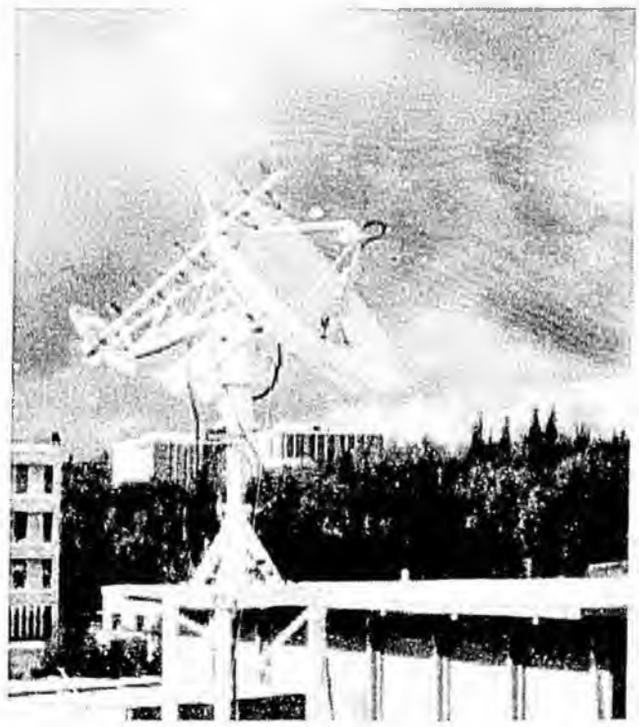


fairbanks satellite ground stations

In 1993 AADC began marketing Fairbanks as the ideal location for satellite ground stations and initiated outreach programs. The initial concept envisioned one facility, the Fairbanks Satellite Ground Station Spacepark, managed by AADC and leased to one or more clients. The operator would be able to design and use the facility to meet individualized requirements. The promotion of Fairbanks as the best location for polar satellite ground station operations in the United States resulted in an overwhelming response from the industry. Numerous companies, however, expressed interest in developing their own facilities rather than leasing facility space from AADC. Because of the growing industry inquiries, AADC contracted with a Fairbanks engineering company for the preparation of a site analysis. This study presented and introduced possible sites in the Fairbanks area for the development of satellite ground stations. AADC has provided this analysis to potential ground station developers to facilitate their site selection process.

The high North latitude, worldwide access through modern telecommunications, transportation infrastructure, Arctic Region Supercomputing Center and existing technical expertise make Fairbanks an ideal location for polar orbiting satellite ground station operations. Because of Fairbanks' proximity to the North Pole the location is very advantageous to ground station and remote sensing companies. Ground stations in Fairbanks have the potential for receiving an additional 10-12 passes a day as compared to 2 passes per day in the Lower 48. These additional passes provide more opportunities for ground station facilities to collect critical information while tracking orbiting satellites.

Development of ground stations also provides a significant opportunity to establish spin-off ventures in the Fairbanks area for the processing and marketing of satellite-generated data. AADC expects the Cray T3D supercomputer at the University of Alaska Fairbanks' Arctic Region Supercomputing Center to serve as an added attraction for the local processing and packaging of satellite and remote sensing data. The expanding Fairbanks satellite ground station activity already has brought added credibility to Alaska as a location for aerospace business, and Alaska is taken seriously as a competitor for other aerospace related projects.



Fairbanks Ground Station

Successful Initiatives

Numerous companies have expressed interest in implementing ground station operations in Fairbanks primarily due to the increased opportunity provided to track satellites, collect data and maintain overall satellite operations. Presently there are five operating ground stations in Fairbanks.

Space Imaging - EOSAT (formerly two separate companies: Space Imaging, Inc. 'SII' and Earth Observation Satellite Company): AADC initially began working with SII, a subsidiary of Lockheed Martin Corporation, in late 1993 when SII named Fairbanks as the site for its land remote sensing satellite system. Prior to its merger with SII, EOSAT worked with AADC to begin its Alaska initiative by locating an Expeditionary Ground Station in Fairbanks, which collected data imagery from the LandSat Satellite. After a successful development effort, Space Imaging - EOSAT, the world's largest provider of space imagery, began Fairbanks operations in May 1997.

EarthWatch, Inc. (formerly WorldView Imaging Corporation): AADC first hosted a WorldView visit to Fairbanks in 1993. EarthWatch acquired property to develop its ground station in Fairbanks to provide weather tracking products and services. EarthWatch has completed construction of its earth station in Fairbanks.

Universal SpaceNet, Inc.: Fairbanks was selected as the site for their company's ground station operation in 1997. Universal SpaceNet is a subsidiary of Universal Space Lines, Inc. and successfully began operating their facility in 1998.

Los Alamos National Laboratory: Two satellite ground stations were established in 1997 and 1998 at the University of Alaska Fairbanks (UAF). The Lab also employs students from UAF to operate the ground station and encourages participation in program familiarization and ground station operator training.

The SAR Corporation: A joint American-Russian venture, the SAR Corporation worked with AADC in selecting Fairbanks as the ground station site for its remote sensing satellite, ALMAZ 1B.

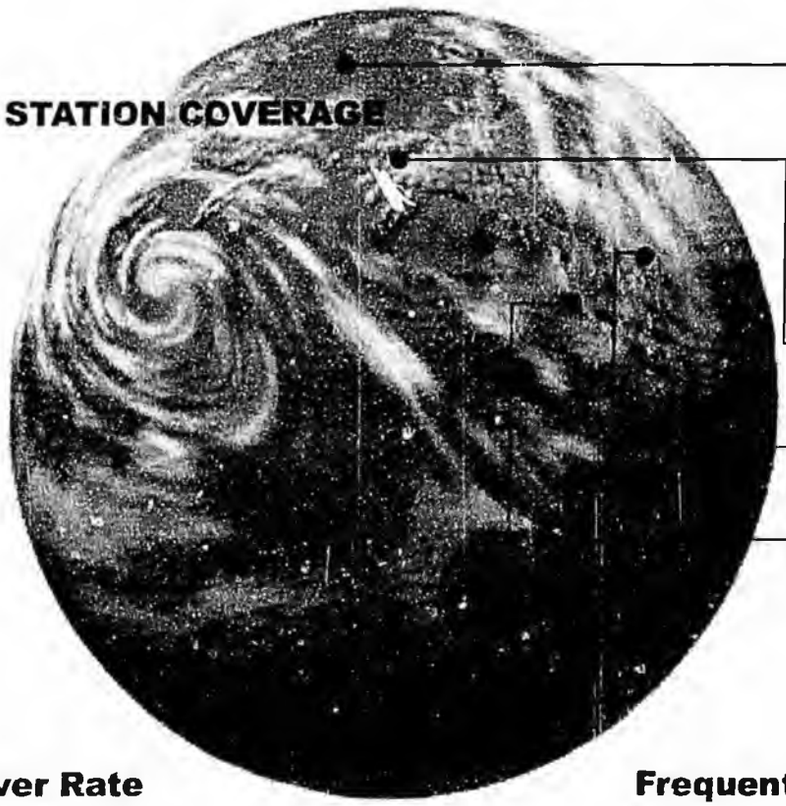
U.S. Air Force: Fairbanks was selected as the site for the Air Force's Miniature Sensor Technology Integration (MSTI) remote sensing program. Development plans were finalized and the ground station operations were performed for satellite data recovery for the on-orbit life of the satellite. They ceased operations in 1996.

Future Development Efforts

Spectrum Astro has indicated they are evaluating the potential for establishing ground station operations in Fairbanks. Spectrum Astro is one of the industry's leaders in developing space technologies for scientific, defense and commercial applications.

AlliedSignal has also reported they are making final decisions regarding a location for operations in Fairbanks. AlliedSignal is an advanced technology and manufacturing company serving customers worldwide with aerospace and automotive products, chemicals, fibers, plastics and advanced materials.

OrbImage, a subsidiary of Orbital Sciences Corporation, has contacted AADC and indicated strong interest in locating a ground station in Fairbanks for its OrbView remote sensing satellite. Prior to discussions with AADC, OrbImage had planned for development of two ground stations in the lower 48.



High Flyover Rate

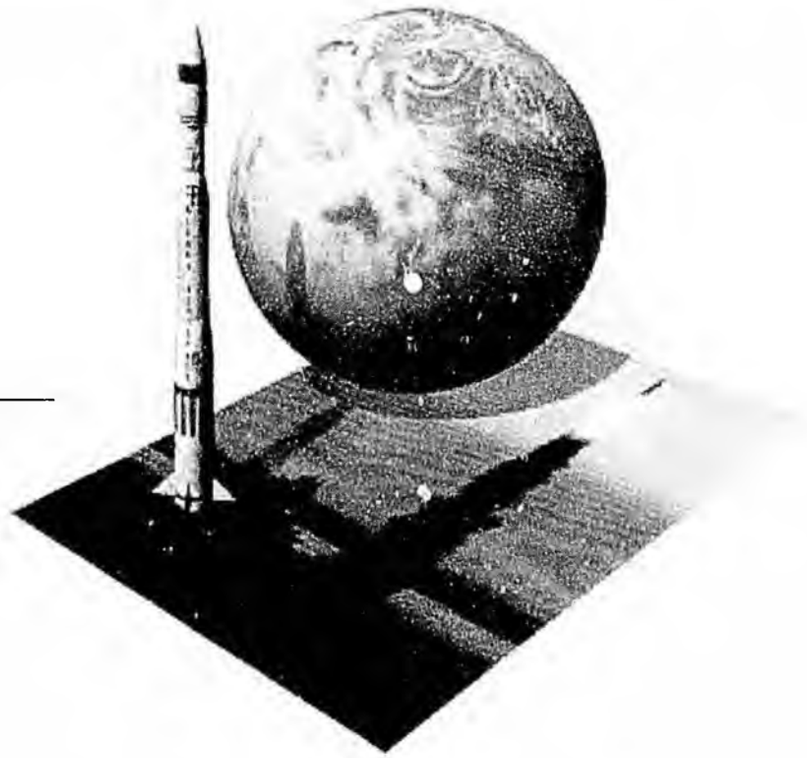
Maximum 360° Horizon

Frequent Data Download

Frequent Satellite Command

Challenges Ahead

AADC's challenge is to build a strategy that will encourage development of commercial ground stations which perform data processing, manipulation, archiving and distribution locally – rather than sending the raw data outside Alaska for development. These types of operations have the potential to provide additional jobs for each ground station facility, including entrepreneurial spin-offs. Even more importantly, because the data is archived in Fairbanks, there is substantial opportunity for local value-added processing required for a finished market product. The Fairbanks community will have first access to the data, providing any entrepreneurial efforts with a competitive edge in a rapidly expanding global market – one that retains a high return on investment, has low operating costs, and provides high-income employment opportunities.



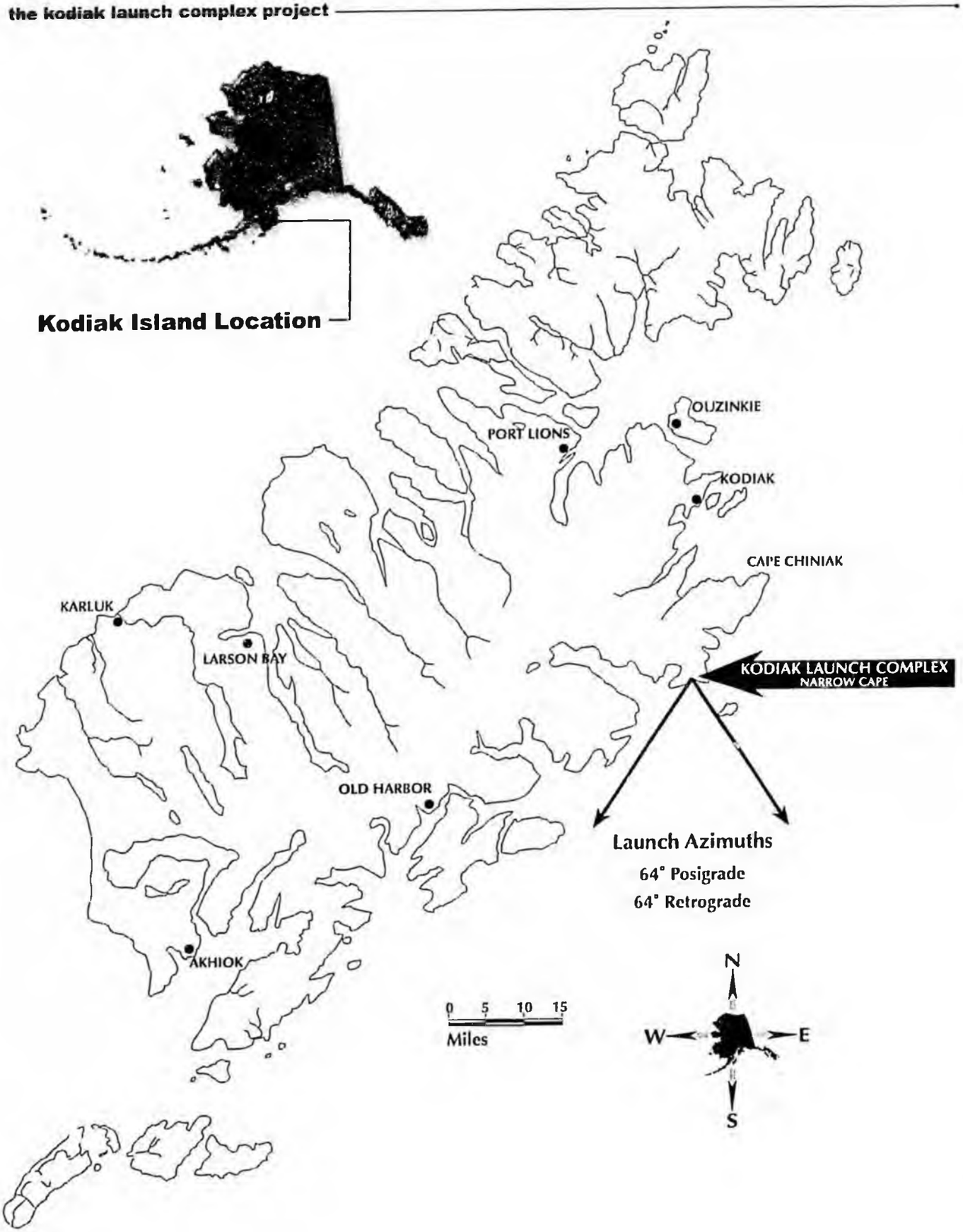
the kodiak launch complex project

Kodiak Island Location

AADC examined 27 possible launch sites in Alaska. After narrowing the possible launch sites to Fairbanks, Kodiak and Seward, AADC's Board considered advice from its team of safety, environmental and legal consultants. Fairbanks was eliminated based upon safety concerns that it could not have met federal safety criteria for commercially viable launch vehicles. Of two possible sites in Seward, one posed significant safety problems and the other posed significant environmental problems. The Board concluded that Kodiak Island presented the best location for the launch site. Besides having existing technical support infrastructure and logistical support, Kodiak's greatest advantage is its wide open launch corridor and unobstructed down-range flight path. As depicted on the following page, Kodiak offers a launch azimuth from 64° posigrade to 64° retrograde. Based upon road access, safety issues and current land use and availability, the Board of Directors of AADC unanimously selected Narrow Cape as the optimal site for the KLC at its March 1994 meeting. Through an agreement with the State Division of Land, AADC was granted a thirty year lease of approximately 3,100 acres at Narrow Cape with an option for a second thirty year term.

Kodiak Island has approximately 15,000 residents, with roughly half living within the City of Kodiak. A broad range of skilled services is available on the island. Resident companies include a sophisticated local telephone exchange, an island-wide electrical utility, a cable television company, several grocery store chains, a highly skilled construction workforce and other skilled technicians. Medical, safety and firefighting personnel are also available to provide assistance to launch personnel.

The weather on Kodiak Island is similar to that of the


Kodiak Island Location
OUZINKIE
PORT LIONS
KODIAK
CAPE CHINIAK
KARLUK
LARSON BAY
KODIAK LAUNCH COMPLEX
NARROW CAPE
OLD HARBOR
AKHIOK
Launch Azimuths
64° Posigrade
64° Retrograde
0 5 10 15
Miles
N
W
E
S

northwest region of the U.S. with an average rainfall comparable to Cape Canaveral in Florida. Because of warm Japanese currents, the climate of Kodiak Island is more moderate than its northern latitude would otherwise dictate. Kodiak has a yearly mean temperature of 40°F, and in only three months of the year do the normal temperatures fall below 32°F. Visibility and prevailing winds compare favorably with those at Vandenberg Air Force Base (VAFB) in California.

Kodiak Island has a wealth of transportation facilities to benefit launch activities at the KLC. Kodiak is one of the busiest fishing ports in the U.S., and has developed sophisticated infrastructure to support that industry. The island boasts three commercial dock facilities and is regularly serviced by ocean shippers. In addition to barge service, the dock facilities can safely handle 35 ton containers, lift off up to 75 tons and process roll-on/roll-off vehicles.

In addition to full service ocean port operations, Kodiak has a state-operated regional airport for handling incoming passenger and cargo traffic. The airport routinely handles daily passenger and cargo jet service and has accommodated C-141 and C-5 military transports. The on-island commercial transportation system includes light to heavy trucking, light aircraft, and medium weight helicopter lift capability. Major shipping and airport facilities exist in Anchorage, which is a hub for the shipment of goods between the lower 48 and the Far East. Commercial and Department of Defense (DoD) facilities in Anchorage can handle all commercial and military transport aircraft. Several options exist for the transportation of flight hardware, equipment and personnel from outside Alaska to the KLC site.

Kodiak Island is home to the largest Coast Guard support center in the U.S. and has a full complement of ocean patrol vessels. Additionally, the Coast Guard Air Station currently consists of several HC-130 aircraft and HH-60 and HH-65 helicopters. The base has skilled technicians providing aircraft maintenance, fabrication, welding, pneudraulics, machining, sheet metal, electrical, avionics and marine electronics services. When suitable services are not available in the local community, its capabilities will be made available to KLC users pursuant to provisions of the Commercial Space Launch Act providing for federal assistance of launch activities. The Coast Guard services complement to those available commercially on Kodiak Island.

Kodiak offers comfortable accommodations for launch personnel, including hotels, motels and numerous bed and breakfast establishments. Restaurants are plentiful, and outdoor recreation opportunities are unmatched.

The logistical advantages of Alaska help to mitigate any cost to launch companies from Kodiak operations. Federal Express, UPS and DHL Worldwide operate major international transfer facilities at the Anchorage International Airport, providing rapid delivery service from major markets throughout the U.S. Alaska Airlines and Era Aviation offer package delivery to Kodiak on all of their flights to Kodiak. Moreover, AADC, in cooperation with the Kodiak Island Borough, was successful in receiving designation for the Kodiak Airport, Kodiak's dock facilities and the KLC site as a foreign trade zone. This will exempt foreign payloads and launch vehicles from customs duties otherwise imposed on those activities. A foreign trade zone also will benefit other Kodiak activities, reducing taxes and encouraging processing activities.

Summary of KLC Development 1993 to 1998

In 1993, the development of the Kodiak Launch Complex began in earnest as AADC undertook the tasks of site selection, design and site safety analysis. With the Board decision in 1994 to proceed with a launch complex in Kodiak, AADC embarked upon an extensive environmental analysis. By 1995, AADC completed the first KLC business plan while continuing the environmental assessment and undertaking the state permitting process. Some milestones of note for 1995 included:

- Alaska House Bill authorizing state financing of the KLC passed
- Completion and distribution of Draft Environmental Assessment of the KLC
- Zoning approval from Kodiak Island Borough

The state permitting approval process was completed in 1996 and a "Finding Of No Significant Impact" for the Environmental Assessment of Narrow Cape was issued by FAA/AST. In addition, AADC received a $6,000,000 Air Force Spaceport Launch Services Contract enabling AADC to compete for future Air Force launch missions.

By 1997, AADC established an AADC Liaison Office in

Kodiak and selected a local representative to interface directly with the Kodiak community. Throughout the year, KLC's viability continued to grow as additional funding was secured through:

- $17.91 million federally funded capability investment
- $5 million granted from the Alaska Science and Technology Foundation
- $4.9 million grant from NASA for construction of the payload processing facility

In 1998, AADC commenced the KLC construction, completing site preparation and achieving 40% of overall construction effort. In September, AADC was issued a site operator's license for the KLC by the FAA's Office of the Associate Administrator for Commercial Space Transportation (AST). This was a critical milestone for AADC, bringing to fruition a four year environmental and permitting process. Receipt of the license also allowed AADC to officially activate service for government and commercial customers. Soon after the approval of its license, AADC achieved one of its most significant accomplishments to date - the KLC's successful inaugural launch of the Atmospheric Interceptor Technology "ait" mission on November 5, 1998.

Benefits of the Kodiak Launch Complex

Economic Impact

While the construction of the KLC is continuing, the Complex has already made a significant impact on the economy. The inaugural launch generated in-state revenues from launch operations and supporting activities. According to the University of Alaska Anchorage, Institute of Social and Economic Research (ISER), AADC's inaugural launch injected $1.3 million dollars into the state's economy. Kodiak Island benefited directly as the launch provided a $700,000 gain to its economy. Anchorage fared nearly as well with a $600,000 gain.

Construction Impact

In 1996, ISER produced a study which estimated overall economic impact of construction and operation of the KLC. The study estimated the economic impact of the construction phase to be a total of $10.8 million for the state. An update of that study is currently underway, and the economic impact is anticipated to be greater than was originally projected in 1996.

In addition to local support services for facility operations, the KLC may also provide opportunities for training local Alaskans to directly support launch operations. Local expertise would provide a cost effective source of employment to the KLC as well as a means of establishing more community ownership of the KLC, effecting a re-circulation of dollars earned as a result of the facility within the local and state economies.

Educational Benefits

The Challenger Learning Centers, part of the national Challenger organization founded by the families of the crew members of Challenger Flight 51L, were developed nationally to promote student interest in math, science and technology. Spearheaded by Executive Director Pat Ladner, AADC initiated the effort to bring a Challenger Learning Center to Alaska by promoting the program to communities through the State. AADC also contributed to a feasibility study that was instrumental in the City of Kenai's winning approval in 1996 from the national Challenger board to be the home of the Challenger Learning Center of Alaska. Today, Kenai's feasibility study is showcased as the "model feasibility study" for other applicants around the country. Because many Alaskan schools are situated in remote locations, the Challenger Learning Center of Alaska has become involved with the national Challenger organization's "Roadless Education" program to explore distance learning opportunities.

The presence of the KLC will also inspire other educational opportunity for Alaska's students. "Project Lift Off," a Kodiak space camp allowed younger students to study math, science and space related activities, complete with actual model rocket launches from the KLC. At the university level, AADC is pursuing opportunities to become involved with aerospace technology degree and training programs at Kodiak College. AADC will continue to promote educational opportunities at all levels throughout the State, encouraging activities and programs involving launch activities, aerospace scientists and engineers, and representatives of aerospace companies.

Infrastructure Improvements

AADC, in cooperation with the State of Alaska Depart-

ment of Transportation and Public Facilities (DOT&PF), has commenced with improvements of the road to Narrow Cape. Additionally, AK DOT&PF has committed to increase maintenance of the road to support launch operations. Through ongoing coordination and teamwork with AK DOT&PF and Kodiak Island Borough, AADC plans to identify and work towards long-term road improvements that will not only benefit the operations of the KLC but also the Kodiak Island Borough as a whole.

In support of the KLC operations, AADC plans to install a permanent microwave communications system Discussions are underway with Kodiak's local service provider and representatives of the Borough to include expansion of phone service to Pasaghak in conjunction with the KLC permanent communications installation. Other communication, transportation and logistical services to Kodiak may also be improved as KLC activities increase.

Other Aerospace Developments
As the foundation of AADC's aerospace development effort, the KLC has been instrumental in bringing the attention of the aerospace industry to Alaska. Development of the Fairbanks ground stations, for example, was aided by the visibility of the KLC development. Launch activity at the KLC will continue to increase consideration of other parts of Alaska, including Anchorage and Fairbanks, for aerospace ventures by launch providers, payload and other aerospace companies. AADC expects spin-off opportunities will include additional ground station operations in Fairbanks, projects utilizing UA's supercomputer, final test and assembly of payloads, warehousing of components and products, establishment of support companies, research and development opportunities, data processing and analysis, and the location of launch and launch service companies in Alaska to be closer to the activities at the KLC.

KLC Capital Contributions

Since the project's inception, AADC has explored all possible funding and financing mechanisms. The following provides a summary of the various sources of funding secured for development and construction of the KLC:

Federal Government
Since 1993, the Federal Government has supported the KLC for many reasons, most notably for the KLC's ability to help develop the necessary assets and infrastructure crucial to increasing the United State's commercial aerospace industry. In support of AADC's efforts, the Federal Government has made investments in the KLC through three sources: The National Guard, NASA and United States Air Force.

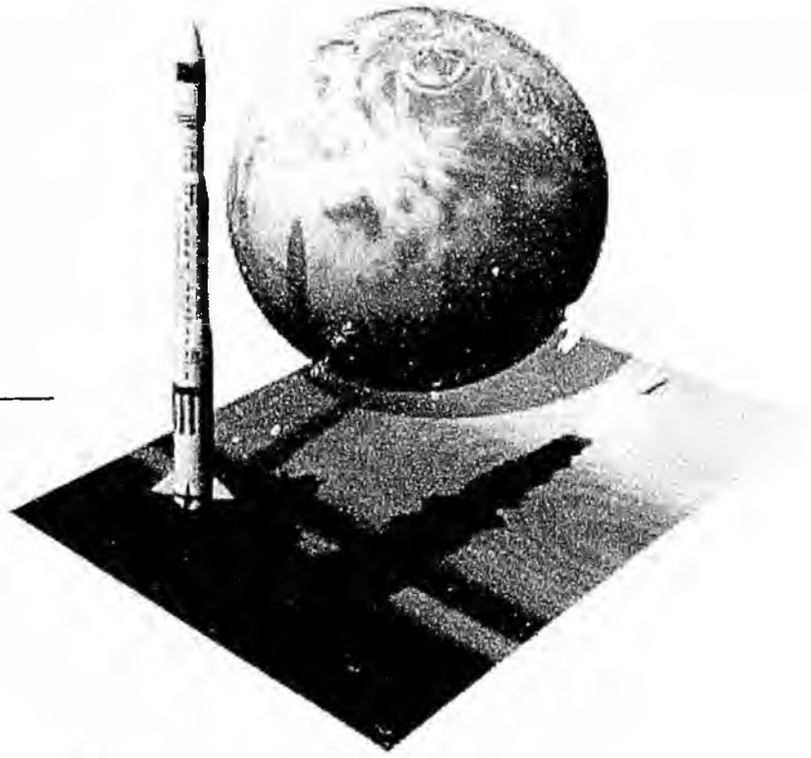
The National Guard
AADC received federal funding with a $17.91 million capability investment to support missile defense development testing. This investment provided the majority of funding necessary to complete construction of the KLC facilities.

NASA
NASA has committed to working with the KLC to explore ways that it may provide instrumentation and technical support at its direct cost to AADC pursuant to the terms of the Commercial Space Launch Act. Further support by NASA is evidenced by two separate grant awards for development and construction of the KLC totaling over $5.7 million.

United States Air Force
In 1993 and 1994, the United States Air Force granted AADC $1,850,000 to assist in the early design and environmental analysis of KLC. These awards were based on the Air Force's assessment of the viability and usefulness of the KLC to both government and commercial launch providers.

State of Alaska
Alaska Science and Technology Foundation
AADC has received ongoing support for its annual operating budget from the Alaska Science and Technology Foundation. In addition, AADC received a $5 million grant from ASTF for construction of the Kodiak Launch Complex resulting in funding for project and contract management and site work.

Industry
Recognizing the strategic value of the KLC, nearly every major aerospace company in the U.S. has assisted AADC in developing the KLC. Throughout every stage of the project, from design of the facility to development of the operations concept, AADC has sought advice and input from the international aerospace industry. The KLC will represent a truly collaborative effort and an ideal choice for launch services for both foreign and domestic customers.



KLC facilities and operations

Kodiak Launch Complex Structure

The KLC will be an all-weather, in-door processing and launch facility for Athena and Taurus class vehicles and certain suborbital launches. The launch complex will have all the necessary facilities for full operational capability. The KLC complex will consist of the following facilities:

- Launch Control and Management Center
- Payload Processing Facility
- Integration and Processing Facility
- Spacecraft and Assemblies Transfer Facility
- Launch Pad and Service Structure

These facilities will provide all of the necessary functions for full year-round operational capacity. The facilities have been designed to be prefabricated off-site, with only modular installation on concrete pads on-site. These facilities will be compatible with all available small launch vehicles and have been designed to incorporate additional facilities to support future increased demands.

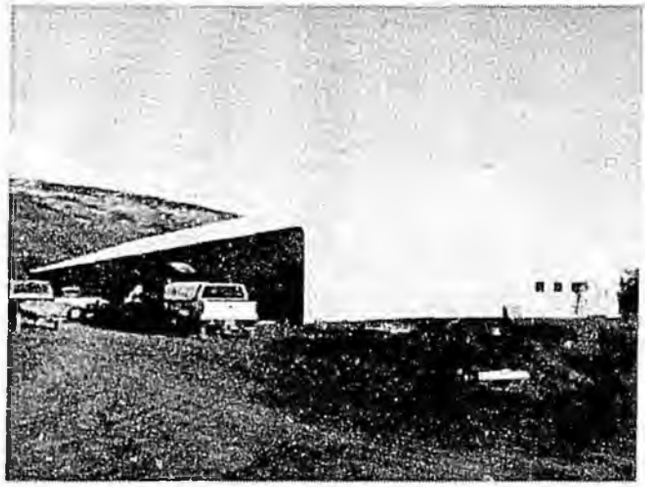
Launch Control and Management Center

The Launch Control and Management Center (LCC) is the operational and management hub of the KLC. The LCC will provide space for administrative services, dispensary services, work areas for launch and payload personnel, VIP viewing areas, conference rooms and missions/launch control. The facility is planned as pre-engineered metal building construction, designed for climate and geographical conditions. It will be approximately 80 feet wide by 175 feet long, comprising 14,000 square feet overall.

Payload Processing Facility

The Payload Processing Facility (PPF) will serve the direct needs of the payload customer community. Spacecraft will be received, stored, processed and checked out in the PPF before being moved to the launch pad. Space also will be provided to receive, inspect, clean and stage the payload fairing. Spacecraft encapsulation within the fairing can be accomplished in the highbay prior to moving to the launch pad.

Open architecture design is emphasized to allow ease of expansion. This includes provision for additional future



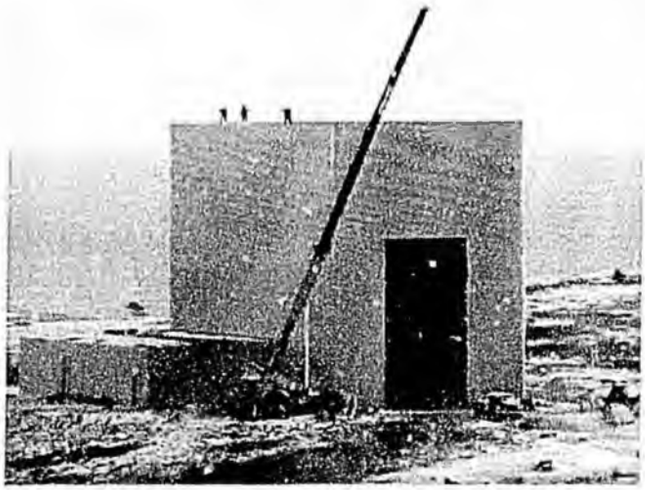
Launch Control and Management Center (LCC)

high bays for spin stabilization and processing.

The PPF high bay will include a 40 foot by 60 foot airlock and a 40 foot by 60 foot processing bay, each with 2,400 square feet of floor space. A 15 ton bridge crane offering 50 feet of hook height will serve both the airlock and the processing bay. A single interior 20 foot by 58 foot clear height roll-up door separates the airlock and the processing bay.

Integration and Processing Facility

The Integration Processing Facility (IPF) is a multi-function building providing for receiving and staging of equipment, components and flight hardware; receiving, checkout and integration of launch vehicle stages; processing and testing activities; and equipment storage. The IPF will be an insulated, pre-fabricated building 50 feet by 100 feet, with a 40 foot roll-up door at each end. It will contain at least one 25 ton bridge crane with 40 feet of hook height.



Payload Processing Facility (PPF)

Spacecraft Assemblies Transfer Facility

The Spacecraft Assemblies Transfer Facility (SCAT) is a self-contained, environmentally controlled structure for transporting launch vehicle and payload assemblies from the IPF and PPF to the launch pad. The SCAT will provide all propulsion system stages and flight hardware processed in the IPF to remain in a conditioned and controlled environment during transport to the launch pad by minimizing temperature fluctuations and protecting flight hardware from exposure to the weather.

To allow for movement of flight hardware and ground support equipment into the SCAT without exposure to the outdoor environment, a 20 foot wide by 40 foot clear height roll-up door at one end of the SCAT will interface with an identically matched door on the IPF. The SCAT structure will have an articulated wheel system permitting controlled movement between the IPF and the launch pad. All items transferred in the SCAT will be positioned in their normal transporting and assembly carts. At the launch pad the SCAT will interface with a matched door in the Rotating Service Structure, permitting breakover of the launch vehicles from horizontal to vertical with the launch pad crane.

When the payload is ready for stacking, the SCAT will be positioned adjacent to the rotating service door to allow the payload to remain within a controlled environment.

Launch Pad and Service Structure

The launch pad consists of the pad apron and flame duct and three main sub-structures: the Fixed Service Structure (FSS), the Rotating Service Structure (RSS), and the Rotating Service Door (RSD). The allsteel structure is designed to be operable in a maximum 30 mph wind event, and is designed to withstand a 110 mph wind in the closed configuration.

The service structure is planned as being 170 ± feet in height with the adjustable platforms providing 360 ° of access over the full height of the vehicle. The RSS with the RSD closed will be environmentally conditioned for worker comfort and to meet solid motor thermal conditioning specifications. Removable lower deck inserts will be provided to accommodate growth version launch vehicles that may utilize strap-on motors for enhanced performance.

The service structure will include the FSS with electri-

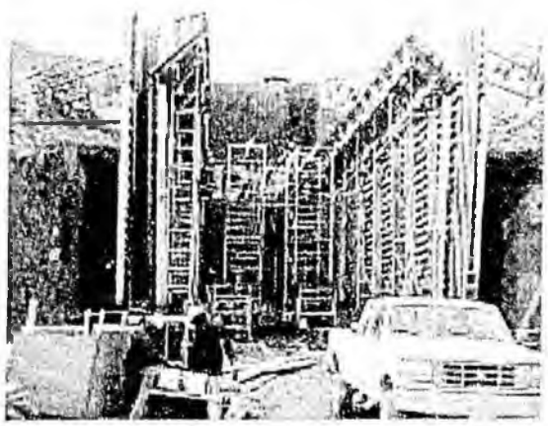
cal/communications equipment room, payload environment control system equipment room, air compressor, and utility risers; RSS providing several clean work areas; and operational systems including operational intercom system, paging and area warning and remote fire reporting. The launch control system will interface the launch vehicle to the LCC. The RSS and RSD will be rotated behind the FSS for some measure of protection from flame and blast during launch. The FSS will have a square cross section with one corner pointing toward the centerline of the launch vehicle. This orientation has been selected to minimize acoustic energy reflection to the launch vehicle during launch.

The RSS will support a 75 ton bridge crane that will be used to breakover, erect, and place stages, service modules, the payload and/or the payload fairing as required to assemble the vehicle stack on the pad. The door-to-door interface with the SCAT will assure a controlled environment without exposure to the elements during transfer from the IPF to the service structure and the payload from the PPF.

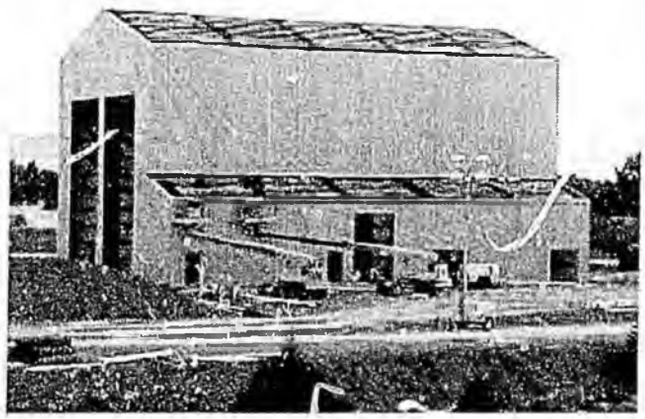
Access to the KLC will be controlled by security personnel during launches. Each facility will be protected by security fencing and have controlled access during hazardous operations. Appropriate safety measures will be taken regarding the transportation, storage and use of hazardous and explosive materials.

Maintenance and Operation of the Kodiak Launch Complex

By Alaska statute and pursuant to the terms of its spaceport site operator's license, AADC is responsible



Flame Trench for the Launch Pad



Integration Processing Facility (IPF)

for the operation and safety of the KLC. All KLC customers are required to comply with the terms and conditions of the site license as well as any plans, policies, procedures, permits, memorandums of agreement or other documentation developed as part of the licensing process. Appendix A provides a listing of current documentation.

Under Alaska and federal law, AADC is required to secure insurance for liability that may arise from management, operations and maintenance of the KLC grounds, property and equipment. AADC's current insurance coverage for its administrative operations is provided by the State of Alaska's Division of Risk Management . Extended coverage for the site will be provided by Risk Management upon commencement of KLC operations. Business interruption coverage is also available if deemed necessary by the AADC Board.

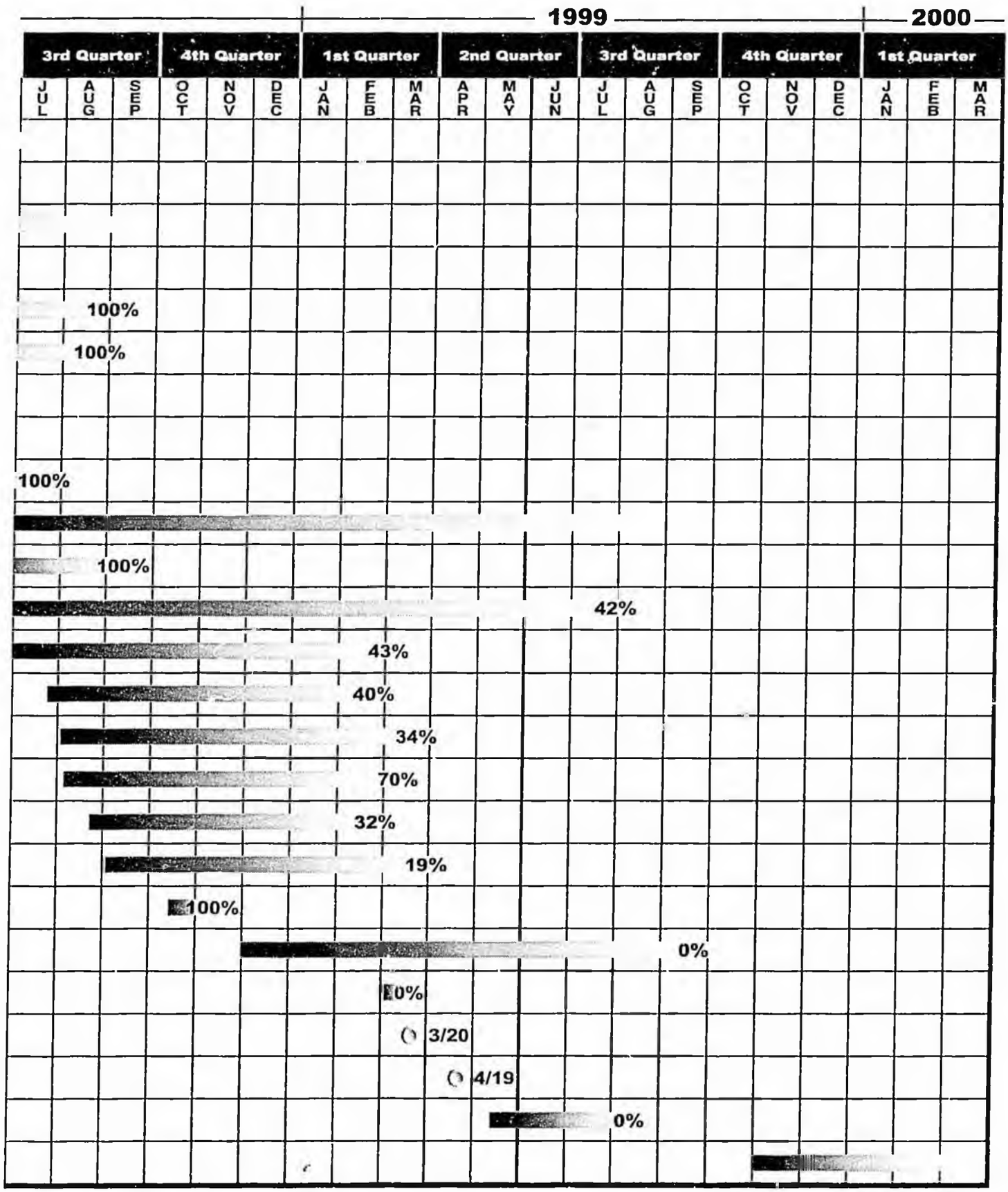
AST, as the licensing authority for all commercial space activities, will also require KLC launch customers to provide separate insurance coverage for each commercial launch mission. As a condition of the launch license process, customers must demonstrate adequate coverage and financial responsibility for the maximum probable loss associated with any third party claims arising from launch operations.

AADC has approached the operation of the KLC as a commercial enterprise. Rather than dictating one set of services for all customers, AADC intends to provide a basic package of services for the negotiated launch fee as well as a series of optional services dependant upon vehicle and mission requirements. This approach offers customers the flexibility to determine the appropriate

KLC Construction Schedule

1998

TASK	START	1st Quarter JAN	FEB	MAR	2nd Quarter APR	MAY	JUN
Phase 1 - Site Work	Mon 1/12/98						100%
Contract Award	Mon 1/12/98		1/12				
Site Work at the Launch Complex Center	Mon 1/12/98						
Site Work at the Integration & Processing Facility	Mon 1/12/98				100%		
Roadway Work	Sat 1/24/98						
Haul & Place at the IPF	Thu 2/26/98						
Phase 1 Punch List	Sun 3/01/98						
Change Orders	Sun 3/01/98						
Waterline Work	Mon 3/16/98						
Phase 2 Construction	Mon 5/25/98						
Mobilization to Site	Mon 5/25/98						
Roadway & Site Work	Tue 6/16/98						
Launch Control Center - LCC	Tue 6/30/98						
Spacecraft Assemblies Transfer Structure	Mon 7/27/98						
Payload Processing Facility	Tue 8/04/98						
150,000 Water Tank Farm	Sat 8/08/98						
Launch Pad 1/ Flame Trench	Mon 8/24/98						
Integration & Processing Facility	Tue 9/01/98						
Launch Campaign "ait"-1	Sat 10/17/98						
Phase 3 Service Structure	Tue 12/01/98						
Cleanup & Punch List	Fri 3/05/99						
Phase 2 Substantial Completion	Sat 3/20/99						
Phase 2 Final Completion	Mon 4/19/99						
"ait"-2 Launch Campaign	Sat 5/15/99						
LOCKHEED MARTIN ATHENA 2 LAUNCH PROGRAM	Mon 11/01/99						


1999
2000
3rd Quarter
4th Quarter
1st Quarter
2nd Quarter
3rd Quarter
4th Quarter
1st Quarter
JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR
100%
100%
100%
100%
42%
43%
40%
34%
70%
32%
19%
100%
0%
0%
3/20
4/19
0%

level of service as well as to negotiate the most competitive price on a per launch basis. Optional services can either be provided by AADC or its contractors, or by the launch customer with approval from AADC.

The flight safety program for KLC launches will comply with FAA/AST launch licensing guidance. The following functions are typical of range safety vehicle flight support and will be adhered to at the KLC unless otherwise modified by federal directive or launch license specific requirement:

- Continually monitor the launch vehicle performance and determine whether the vehicle is behaving normally or failing.
- Track the vehicle and predict (in real-time) where the vehicle of pieces of the vehicle would fall in case of failure and if flight termination action is taken.
- Determine if there is a need to delay or abort the launch or destruct the vehicle base on a comparison of current vehicle status to predetermined criteria.
- If necessary to protect the public, send a command to terminate the flight by initiation of vehicle destruct.

Originally, AADC had entered into a preliminary agreement with NASA's Wallops Island Flight Facility for use of one of NASA's Mobile Range Safety Systems and trained personnel for launch operations at the KLC. The NASA mobile range system would have provided all requisite instrumentation: control, telemetry, tracking, radar and command destruct. AADC has secured an in-kind contribution for an on-site range safety system that will provide all of the requisite instrumentation for a permanent range safety system.

The basic package provides for a fixed level of facility usage and services to launch customers by AADC. AADC will provide assistance with other licenses, permits and exemptions that may be appropriate, including state and federal environmental permits and transportation matters.

- Facility usage – includes use of the Launch Control Center, Payload Processing Facility, Integration Processing Facility/Spacecraft Assemblies and Transfer Building, and Launch Pad/Service Structure for a designated period of time
- Site Equipment – use of handling equipment on site
- Inspection and testing of facilities and equipment, electrical generators, computers, HVAC facilities, communications and other equipment on a regular basis to ensure all systems are functioning properly prior to and during launch campaigns
- Telecommunications – the launch customer will be provided use of PBX, analog lines and access to the Central Office (3 trunk lines)
- Power – primary power and backup (generator), caretaker level
- Operational intercom system – as per current design
- Data Backbone – fiber and copper as per the current design and a basic assortment of data transceivers
- Janitorial and non-hazardous waste removal
- Medical
- Fire Protection
- Intrusion and Detection
- Facility Maintenance and routine site restoration
- Normal consumables used in operation and maintenance
- On-site Program Management and Engineering Support – Monday through Saturday, 8:00 am to 5:00 pm

The following types of services will be negotiated with individual customers and result in additional costs beyond that of the basic launch fee:

- KLC Facility Modification – any user-specific modifications to the facilities or changes in configuration of the communications backbone, operational intercom system, data backbone or other supporting infrastructure
- Power – charge for usage above average caretaker

level during launch campaign

- Hazardous waste removal, launch cleanup and site restoration
- Fire, security and medical during the launch
- Customer specific equipment not currently available at KLC
- Program -unique consumables to support payload and vehicle operations, special gases, etc.
- Engineering Support – additional engineering and technical support beyond stated hours in basic package
- Transportation – all transportation of personnel and equipment to Kodiak and to KLC site
- Range Safety, Telemetry and Frequency Coordination
- Meteorological Support
- Environmental Monitoring

Project Status: Developments and Phased Completion

Phase 1 Status

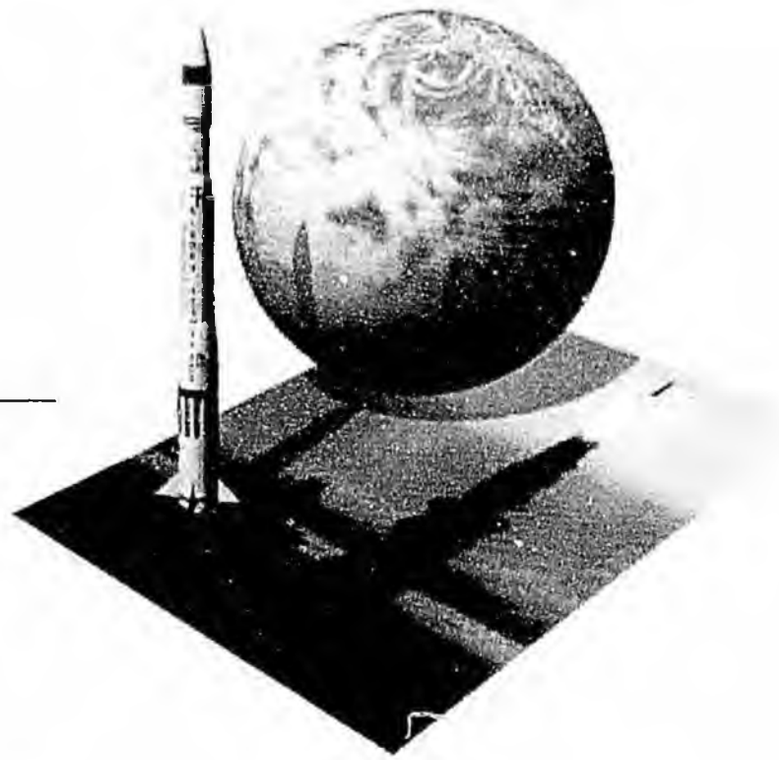
On November 12, 1997, A-K Construction Company of Kodiak Island submitted the successful low bid for Phase 1 (site preparation) at the Kodiak Launch Complex. Since January 13, 1998, A-K has been working continuously at the KLC engaging in site preparation, preparing the foundation work necessary for erection of the buildings. As of November 1998, the majority of all work for Phase 1 has been completed, save some minor final tasks for closing out Phase 1.

Phase 2 Status

On April 8, 1998, Red Samm Construction of Bellevue, Washington submitted the successful low bid for Phase 2, (rocket launch facilities construction) at the Kodiak Launch Complex. A contract was signed on April 20 and Red Samm began mobilizing on site the week of June 8th. As of December 1998, 40% of the construction for Phase 2 had been completed.

Phase 3 Status

In November 1998, Red Samm Construction of Bellevue, Washington submitted the successful low bid for Phase 3, (launch tower construction) at the Kodiak Launch Complex. A Notice to Proceed for the first task on that contract was issued in November. AADC expects completion of the pad in October/November 1999.



KLC market analysis

Overview

In designing the KLC, AADC has targeted a specific growth area of the launch market: payloads under 8,000 pounds requiring polar, high inclination LEO or Molniya orbits. The market for small payloads requiring polar LEO consists of telecommunication systems, remote sensing satellites and government, scientific and microgravity payloads.

As the FAA's commercial spaceport licensing authority and regulator of U.S. commercial space activity, the Office of the Associate Administrator for Commercial Space Transportation (AST) provides AADC with invaluable industry statistics and forecasts for yearly market activity in the United States. AST reports that commercial launch demand is increasingly driven by the telecommunications industry, which provides telephony, television broadcasting, and data communications worldwide. The commercial market will also continue for remote sensing satellites and government, scientific and microgravity payloads. AST defines the following as the commercial market sectors for LEO satellite systems:

"Big LEO" Telecommunications Systems

"Big LEO" systems furnish mobile telephone services to two major markets: international business travelers and rural fixed-site users. Iridium and Globalstar have begun deployment of their constellations and are expected to deploy follow-on systems in the near future. There have been proposals for 13 additional Big LEO systems. Today there are more than 100 million subscribers to analog and digital mobile telephone services. In developing countries, the demand for wireless telephone services has been growing at an annual rate of 11%. Long-term demand for mobile telephony is expected to remain very strong.

"Little LEO" Telecommunications Systems

"Little LEO" systems provide narrow band data services (e-mail, two-way paging, messaging, asset tracking) using frequencies below 1 GHz. The FCC has issued licenses for LEO One USA, FAISat and E-Sat. In 1998, ORBCOMM began full-scale deployment. The two major markets expected for Little LEO providers are automated meter reading and asset tracking which uses both positioning and messaging. Based on a study conducted by the International Telecommunications

Union (ITU), the market for satellite addressable messaging could grow to 43 million subscribers, with 18 million of those subscribers in North America.

"Broadband LEO" Systems
Broadband LEO systems provide high bandwidth data transmission for Internet access, video-teleconferencing and high-speed data transfer. In 1997, Teledesic was the only Broadband LEO system to receive licensing from the FCC. Today, a variety of companies have applied for FCC licenses. The market for broadband communication services is estimated to be $100 million by 2006.

Remote Sensing Systems
Remote Sensing systems collect data to enable the observation of earth from space. While the remote sensing market is not as large as the telecommunications market, the number of projected launches of commercial remote sensing aircraft does constitute a meaningful amount of potential business for spaceports launching in the low earth orbit range. Moreover, the remote sensing system market is currently viewed as underdeveloped and could expand as the market for commercial imagery grows.

Scientific Payloads
Foreign government and scientific payloads constitute another market segment for commercial launch services. Using commercially available small launch vehicles, foreign research organizations launch small spacecraft in order to conduct research in areas such as microgravity, life sciences and communications. Demand for scientific payload launches is expected to increase through 2010.

According to the AST, the market for U.S. commercial LEO satellite services should be analyzed in terms of two scenarios: baseline and robust. Baseline describes the current development plans by the LEO satellite providers and, thus, represents the "baseline" expected to unfold over the forecast period (1999 - 2010). Robust describes a more optimistic, though still reasonable, scenario illustrating greater than expected demand for LEO satellite services over the forecast period. The following statistics illustrate the demand for the LEO market based on both payloads and launches within the United States.

AADC also relies on the Teal Group Corporation's

Table 01 Baseline Scenario Payload and Launch Projections

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL
Payloads														
Big LEO	85	21	17	18	13	9	9	70	78	13	9	9	10	361
Little LEO	18	8	10	32	38	14	4	26	38	34	8	14	16	260
Broadband LEO	0	0	0	64	168	138	17	17	17	17	22	22	22	504
Remote Sensing/Foreign Science	4	3	3	4	6	4	7	7	6	7	8	10	8	77
Total Payloads	107	32	30	118	225	165	37	120	139	71	47	55	56	1202
Launch Demand														
Medium to Heavy (>5,000 lb. LEO)	10	7	7	15	43	34	13	25	27	15	17	18	17	248
Small (<5,000 lb. LEO)	9	6	7	13	16	11	12	11	13	15	13	15	14	155
Total Launches	19	13	14	28	59	45	25	36	40	30	30	33	31	403

Table 02 Robust Scenario Payload and Launch Projections

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL
Payloads														
Big LEO	85	21	17	30	13	39	41	90	89	16	28	24	50	543
Little LEO	18	8	28	32	38	14	4	26	50	40	8	14	16	296
Broadband LEO	0	0	0	64	186	172	33	20	20	20	25	25	59	624
Remote Sensing/Foreign Science	4	3	3	4	6	4	7	7	6	7	8	10	8	77
Total Payloads	107	32	48	130	243	229	85	143	165	83	69	73	133	1540
Launch Demand														
Medium to Heavy (>5,000 lb. LEO)	10	7	7	18	45	43	22	36	38	15	21	20	28	310
Small (<5,000 lb. LEO)	9	6	11	13	16	11	12	15	19	21	17	19	19	188
Total Launches	19	13	18	31	61	54	34	51	57	36	38	39	47	498

Source: 1998 LEO Commercial Market Projections, Associate Administrator for Commercial Space Transportation

Table 03 Estimated World Wide Satellite Delivery Schedule

(In payload unit)	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Commercial Communications Satellites											
Broadband Multimedia	2	26	188	213	197	57	9	7	2	4	705
Mobile	124	199	71	68	31	33	64	60	34	6	690
Telecommunications/Broadcast	44	21	16	3	2	1	3	-	-	-	90
Direct-to-Home Broadcast	26	21	7	4	-	2	1	-	1	-	62
Subtotal	*196*	*267*	*282*	*288*	*230*	*93*	*77*	*67*	*37*	*10*	*1,547*
Civil Satellites											
Scientific/Space Exploration	39	20	17	8	11	5	9	1	9	-	119
Earth Observation & Meteorological	12	10	11	5	7	2	1	3	1	3	55
Technology Development	16	14	-	4	-	2	-	-	-	-	36
Communications	15	5	2	1	-	2	-	-	-	-	25
Subtotal	*82*	*49*	*30*	*18*	*18*	*11*	*10*	*4*	*10*	*3*	*235*
Military Satellites											
Reconnaissance & Surveillance	-	3	8	11	8	8	11	8	-	-	57
Early-Warning	1	2	1	4	4	10	10	4	-	-	36
Navigation	8	4	5	1	2	2	3	3	3	3	34
Communications	11	2	-	2	2	2	1	3	2	2	27
Technology Development	18	4	2	-	1	-	-	-	-	-	25
Earth Observation & Meteorological	-	2	-	2	-	-	-	-	-	-	4
Subtotal	*38*	*17*	*16*	*20*	*17*	*22*	*25*	*18*	*5*	*5*	*183*
Other (Missions, Satellites, Capsules)											
Manned & Space Operations	22	19	18	20	9	-	1	-	-	-	89
Commercial Earth Imaging	14	16	8	8	1	-	2	1	1	1	52
Microgravity Experiments	6	3	1	-	-	-	-	-	-	-	10
Commercial Scientific/Technology	1	4	1	-	-	-	-	-	-	1	7
Subtotal	*43*	*42*	*28*	*28*	*10*	*0*	*3*	*1*	*1*	*2*	*158*
World Wide Total	**359**	**375**	**356**	**354**	**275**	**126**	**115**	**90**	**53**	**20**	**2,123**

Source: Teal Group Corporation, "World Space Systems Briefing", November 1998

Polar Orbit
The polar orbits allow maximum coverage of the earth's surface.

Geostationary Orbit
The Geostationary orbit is an orbit 22,400 miles above the Earth in which a satellite makes its journey around the Earth's equator in 24 hours.

Molniya Orbit
The Molniya orbit is a highly elliptical orbit used primarily for communications. This orbit allows a specific geographical region prolonged exposure to a satellite as it enters its apogee.

Table 04 Customer Regions

(In payload units, by %)	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
North America	43.5%	42.7%	64.3%	72.0%	76.0%	64.3%	84.3%	90.0%	98.1%	85.0%
CIS	24.0%	32.8%	19.9%	11.0%	4.0%	12.7%	0.9%	0.0%	0.0%	0.0%
Europe	12.5%	7.2%	5.3%	12.1%	15.6%	17.5%	7.8%	6.7%	0.0%	15.0%
Asia & Pacific Rim	13.6%	10.1%	8.1%	2.8%	3.6%	4.8%	6.1%	2.2%	1.9%	0.0%
Latin America & Caribbean	2.8%	4.0%	0.6%	0.3%	0.7%	0.8%	0.9%	1.1%	0.0%	0.0%
International	1.4%	2.1%	1.1%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Africa & Middle East	2.2%	1.1%	0.6%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: Teal Group Corporation, "World Space Systems Briefing", November 1998

industry analysis. The Teal Group, a respected and experienced organization of analysts and service professionals, researches and publishes timely, accurate information on the aerospace industry worldwide. In examining civil, military and commercial customers worldwide, the Teal Group breaks down payloads according to four types: Commercial Communications Satellites; Civil Satellites; Military Satellites; and Other (Missions, Satellites, Capsules). As shown on Table 03, the Teal Group breaks these categories down further into more specific types of payloads.

Over 50 countries have proposed developing and launching payloads over the next ten years. The Teal Group's projections (Table 04) show that nearly half to almost all of these launch customers will be in North America.

Out of the total available market shown in Table 05 the Teal Group has projected that from 1999 through 2008, the LEO market will capture between 44% and 75 % of the total available orbits market.

determined that approximately half of the Athena's projected launches would take place from North America. Table 06 shows the Teal Group's total number of projected Athena launches worldwide during its forecast period.

Additional market analysis was provided by Aries Analytics, Inc. Aries is an aerospace consulting firm in Arlington, Virginia and member of the Space Transportation Association (STA), an industry/government oriented association that represents the interests of organizations and people engaged in developing, building, operating, and using space transportation vehicles, systems, and services to provide reliable, economical, safe, and routine access to space for private users and government, civil, and military users. Aries recently reviewed manifests presented in current government and trade publications and estimated that the KLC could reasonably expect up to six launches per year in the near term (42 months) and ten launches per year in the future (60 months).

Table 05 LEO Market

Market	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Low Orbit	211	256	267	255	199	70	85	66	32	9
Total Orbits	359	375	356	345	275	126	115	90	53	20
Low Orbit as % of Total	58.8%	68.3%	75.0%	73.9%	72.4%	55.6%	73.9%	73.3%	60.4%	45.0%

Source: Teal Group Corporation, "World Space Systems Briefing", November 1998

In addition to analyzing the industry market projections, AADC also has examined launch forecast data specific to Lockheed Martin Corporation (LMC), one of the KLC's target customers. LMC has expressed serious interest in becoming one of the KLC's primary customers.

The Teal Group examined LMC's Athena rocket and

AADC KLC Launch Projections

Based upon AADC's market analysis, the KLC's location, cost and administrative efficiencies as described throughout this Business Plan, and AADC's ability to enter into long-term agreements and to respond quickly to market needs, AADC has developed the following launch projections (Table 07) that average roughly 3.3 launches per year. Considerable progress

Table 06 Launch Data for Lockheed Martin

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Athena	3	3	5	5	8	8	5	5	8	8

Source: Teal Group Corporation, "World Space Systems Briefing", November 1998

Table 07 KLC Launch Operations

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Projected Number	1	2	2	3	4	4	4	4	4	4	4

has been made in targeting potential commercial customers for the KLC. AADC has embarked on negotiations with various commercial customers, all of whom believe the KLC will be an opportune launch site. Based on market conditions and forecasts, commercial and government launch projections discussed in this section, and discussions with its customer base, AADC believes its launch projections remain conservative.

KLC Customer Base

AADC has targeted launch vehicle providers as its primary customer. According to the Teal Group, 2,123 payloads are expected to launch between 1999 and 2008. One quarter of these payloads are designated to the large launch vehicles Delta, Proton, and Ariane; however, 1,353 payloads do not have a designated launch vehicle. AADC believes that the KLC will be most successful in capturing launches by targeting the launch vehicle providers because all satellites need a launch vehicle to enter the appropriate orbit.

Competition

Along with an excellent geographic location for aerospace operations, Alaska is in the world's most active trading hemisphere and is positioned as the crown of the Pacific Rim. This strategic location combined with a fully developed transportation system allows for efficient logistics and worldwide distribution. Alaska has a long history of aerospace activity, and with the wealth of technical resources and skilled personnel in our state, is leading the way for an emerging commercial aerospace industry.

While there are numerous launch facilities located at various sites around the world, the KLC's particular market niche narrows competition to only a select few. For example, while Cape Canaveral is probably one of the most widely known spaceports, the KLC is not a direct competitor with Florida's spaceport because the two support mutually exclusive launches. The two spaceports, therefore, have developed a strategic working relationship aimed at strengthening both facilities.

When AADC first began developing its business plan in 1995, the Corporation identified potential domestic competitors in Alabama, Hawaii and California. Today, the spaceport effort in Hawaii has been put on an indefinite hold and the effort in Alabama never moved beyond the feasibility stage. Recently, the California Commercial Spaceport, Inc. (CCSI), long considered the KLC's most serious competitor, ceased its construction effort, and the future of California's commercial space industry is uncertain. Internationally, AADC had originally expected Akjuit Aerospace Inc. in Manitoba, Canada, to be a serious player in the LEO satellite market, especially considering its North American location and design for the US commercial market. Today, however, Spaceport Canada is considered defunct for orbital launch activity as Akjuit Aerospace has ceased operations. While proposals have been made for spaceports in Idaho, Nevada, New Mexico and Arizona, they each plan on launching reusable space vehicles, a technology still in early stages of development.

U.S. Competitors

<u>California</u>

In 1994, California Commercial Spaceport, Inc. (CCSI), the for-profit subsidiary of the Western Commercial Space Center (WCSC), and ITT Defense & Electronics formed the Spaceport Systems

International (SSI) limited partnership to build and operate a commercial spaceport at Vandenberg Air Force Base. In March 1995, the California Spaceport was formally established with SSI's groundbreaking at the southern most corner of the base. In 1996, the FAA granted SSI a commercial launch operator's license. Because of its location on a military range, launches will be subject to US Air Force regulations regarding safety, security, environmental and operating issues. The California Spaceport has received both federal and State support including grants and user sales tax exemption, and private money from ITT Corp.

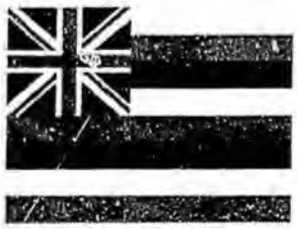
The California Spaceport, intended to support a range of polar orbit inclinations, will perform launch vehicle and payload processing, fairing processing and storage and payload encapsulation. SSI will compete for many of the same customers as the KLC, however, the KLC's location enables it reach more inclinations than the California Spaceport.

Although the California Spaceport was the first commercial space operator to be licensed by the FAA, SSI has encountered various problems including difficulties in securing customer contracts and the California legislature's removal of the WCSC as the state's official spaceport authority. While commercial customers may still contract directly with the Air Force for use of launch facilities at Vandenberg, the for-profit entity promoting commercial launches has not yet hosted a launch. In addition, the California Spaceport's ties with the US Air Force have led to speculation that defense launches will take priority over commercial launches, a serious drawback for commercial customers.

Boeing Sea Launch

The Boeing Sea Launch, a Boeing led joint venture composed of Russia's RSC-Energia, Ukraine's NPO-Yuzhnoye and Norway's Kvaerner Group, is located approximately 200 nautical miles off the coast of California. This facility will use a modified oil platform - mobile base for its launches. Before completing its first launch scheduled for March 1999, the Boeing Sea Launch must overcome some significant obstacles such as the transfer of a fully-integrated launch vehicle from the command ship to the launch platform.

Although capable of polar launches, the Sea Launch is focused primarily on the Geosynchronous equatorial market and is not a direct competitor of KLC. Also, because of the steep capital investment required, the cost of launching from the Boeing Sea Launch is expected to be higher then launching from the KLC.



Hawaii

In 1987, the Governor of Hawaii directed the Hawaii Department of Business and Economic Development to investigate the possibility of space activities in Hawaii. In 1988, the State of Hawaii selected two sites on the southeastern coast of the Island of Hawaii as potential commercial space launch sites. The Hawaii Office of Space Industry worked with AST, which conducted safety studies and approved an environmental impact statement (EIS) for the sites.

In 1992, due to the results of the state's environmental assessment and resident opposition, Hawaii abandoned its Spaceport development efforts. To date, no effort has been made to revive the state's development of the Hawaii Spaceport.

Virginia

With the creation of the Virginia Commercial Space Flight Authority in 1995, the effort began to convert NASA's Wallops Island Flight Facility into a spaceport. In 1997, the Authority and Virginia Governor Allen completed an agreement to permit commercial launches from the Spaceport. The Virginia Spaceport has received approximately $5 million from various sources including the State of Virginia, the Air Force and a Virginia-based private corporation. Upon receiving its FAA operator's license, the Authority began construction in 1998 and expects to begin commercial operations in 2000.

While the Virginia Spaceport will launch some of the same rockets as the KLC, its primary mision is to support equatorial launches. Thus, Virginia is not a direct competitor of the KLC.


WORLDWIDE LAUNCH FACILITIES
CANADA
Churchill Research Range
58.44°N Lat
VIRGINIA
Wallops Island, VA
37.85°N Lat
CALIFORNIA
Vandenberg, AFB
34.7°N Lat
BOEING SEA LAUNCH
Pacific Ocean
200NM off California
FRENCH GUIANA
Guiana Space Center, Kourou
5°N Lat
NORWAY
Andoya Rocket Range
69.17°N Lat
RUSSIA
Plesetsk
62.8°N Lat
CHINA
Taiyuan/Wuzhai
37°N Lat
JAPAN
Tanegashima Space Center
30°N Lat
INDIA
Shar Center
13.47°N Lat
AUSTRALIA
Woomera Rocket Range
31.5°S Lat

Foreign Competitors

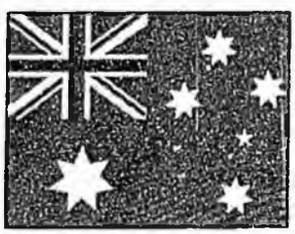
Canada

Akjuit Aerospace Inc.'s original goal was to convert the abandoned Churchill Rocket Range in Hudson Bay, Manitoba, into a commercial space launching facility. Spaceport Canada was envisioned as a privately owned launch site for suborbital and polar LEO satellites in the small to medium size range. The launches would be directed northbound over the Hudson Bay and the unpopulated areas of northern Canada.

Due to a funding shortfall of $72,000,000, and regulatory and communications problems, Akjuit Aerospace is currently closed and has ceased operations.

French Guiana

The Guiana Space Center (GSC), owned by the French space agency CNES, is made available to the European Space Agency/Ariancspace (ESA). Both equatorial and polar orbit launches are possible from the Center, and although its proximity to the equator provides a 17% payload advantage over Cape Canaveral for equatorial launches, greater energy is needed for polar launches. ESA is the predominant launch company in the world today, with the largest share of the world's commercial launch market. The GSC presently does not directly compete with the KLC since it is not designed to launch the size vehicle the KLC is targeting.

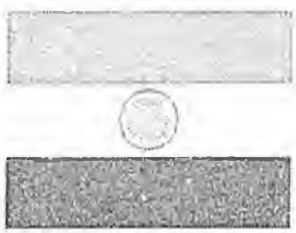


Australia

In the 1950's and 1960's, the Woomera rocket range was the second busiest launch and tracking facility in the Western world, launching ballistic missiles and sounding rockets. Only two satellites have been orbited from the facility: a small Wresat test satellite launched in 1967 and the U.K.'s Prospero launched in 1971. In its recent 1997 push to revamp the Woomera facility, the Australian government has stepped up its marketing efforts and has developed some international agreements with Germany, Russia and Japan. While the facility boasts a good location, its distance from U.S. launch providers and payloaders would be a strong disincentive for U.S. businesses.

China

Taiuaun, one of China's three orbital launch sites, is located southwest of Beijing. The primary purpose of this facility, initiated in September 1988 with the successful launch of a polar meteorological satellite, is to launch CZ-4 boosters into polar orbits for remote sensing, meteorological and reconnaissance missions. While no commercial activity has occurred yet at this site, there is growing commercial usage at its sister site Xichang. China is aggressively pricing launch services at 10 - 15% below market, and if a first launch is unsuccessful due to accident or technical problems, it will launch a second effort at no charge. China poses similar logistics problems as Australia for U.S. launch providers and payloaders, which is complicated by language barriers and a questionable business climate. In addition, national security concerns regarding technology transfer would be present in China but not at the KLC.



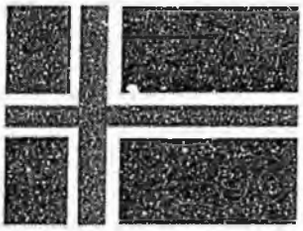
India

Located on the Bay of Bengal, the Shar Center, operated by the Indian Space Research Organization had its first successful launch in July of 1980. It can conduct both equatorial and polar launches, but safety issues restrict the azimuths available for polar launches. An alternative site for southern polar launches, the Balasore rocket launching station, is also available. Both sites may require "dog-legs" for certain launches, decreasing launch capacity. Although India has initiated ambitious government remote sensing and telecommunications programs that promise to keep its launch sites busy, and there has been no indication that India is seeking commercial

launch opportunities for these sites. As of 1998, the Indian Government is continuing to focus on its development of a diversified indigenous launch capability.

Japan

Japan has established two launch sites. Because of government agreements with fisherman who work nearby waters, Japan has historically been limited to only two flights per year from each of its two launch sites. As reported in the Teal Group's 1998 World Space Systems Briefing, the Japanese government and the fishermen unions have begun discussions on expanding the launch window, increasing the number of launch per year to 3. Despite this minor increase in launch ability, AADC expects that the KLC may be an attractive site for Japanese launches. Japan's close proximity to Alaska and well developed trade relationships may translate into a KLC business opportunity.

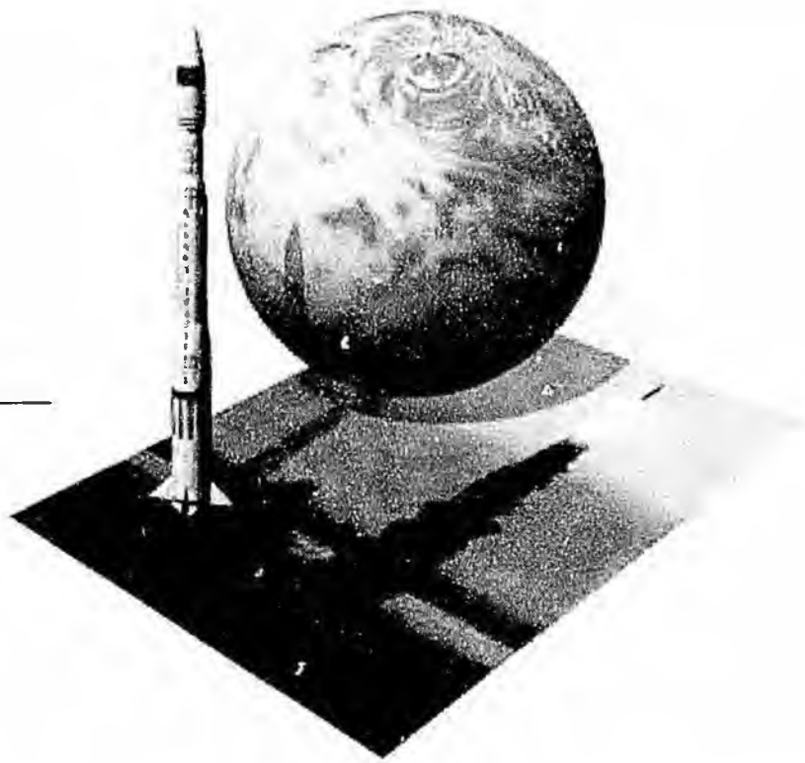


Norway

Now part of the Norwegian Space Center (NSC), the Andoya Rocket Range first launched a sounding rocket in 1962. Since 1972, the range has been supported by ESA members in return for facilities made available on a marginal cost basis. Other customers are charged on a no-profit basis. Launches have primarily been for investigating the upper atmosphere in the polar region and studying ionospheric and magnetospheric processes at high latitudes. A joint Norwegian-Swedish study is now underway on a commercial polar satellite service beginning in 1996. NSC studies show that it could capture three orbital launches annually, with a capacity for six, limited only by possible site access problems during the winter months. There is currently a pad under construction that will support small launch vehicle launches for polar orbit activities. Norway has also begun marketing the range as an ideal site for small satellite launches, and like the KLC, its proximity to the North Pole makes it particularly well-suited for polar orbit launches.

Russia

Plesetsk, Russia, once the world's busiest spaceport, has seen its activity decrease from 62 flights per year a decade ago to 13 flights in 1998. Situated in the northwestern corner of Russia, it can place communications and spy satellites in certain polar and highly elliptical orbits. The facility is efficiently organized and uses highly automated launch vehicles. If the political and business climate stabilizes, and this facility begins to aggressively market its services, it could become a competitor for the global polar launch market. However, Plesetsk is limited to certain inclinations and will pose considerable logistics difficulties to U.S. launchers and payloaders.



strategic planning

As AADC moves into the 21st century, the Corporation has targeted short term (1999) and long term (2000-2005) goals essential to ensuring the success of the KLC and maximizing all aerospace related possibilities for the state.

1999

GOAL: **Secure funding for LP 1 Tower**

ACTIONS: Legislative approval to receive and expend $7M in federal funds

Identify source of final $5M and receive legislative budget approval

GOAL: **Sign launch agreement with Lockheed Martin for three commercial launches**

ACTIONS: Sign contracts for NASA VCL, QuickBird and ICESat launched by LMC

GOAL: **Fund and install digital microwave communications link from KLC to Kodiak**

ACTIONS: Negotiate terms of agreement with PTI for permanent communication system for KLC

GOAL: **Refurbish C-band Radar**

ACTIONS: Determine cost of radar upgrade and installation

Establish timeline for integration of radar with KLC infrastructure

GOAL: **Field Range Safety System**

ACTIONS: With the commitment for an in-kind contribution for an on-site range safety system, the KLC needs to receive, install and test the system

GOAL: **Activation of KLC Foreign Trade Zone**

ACTIONS: Determine necessary level of effort and funding to activate site

GOAL: **KLC Users Manual**

ACTIONS: Develop a manual outlining policies and procedures for KLC customers

2000 - 20005

GOAL: **Develop and implement Strategic Marketing Plan for all aerospace related development for the State of Alaska**

ACTIONS: Identify additional KLC customer base

Define scope of marketing efforts for AADC

Identify effective marketing tools for AADC

Develop a public outreach program

Explore aerospace and/or ground station conference hosted by AADC

GOAL: **Develop Launch on Demand (LOD) Capability**

ACTIONS: Finalize partnership with commercial launch provider for presentation of LOD concept

Coordinate with AST in establishing LOD as the industry standard for satellite constellation deployment and replacement

GOAL: **Satellite Manufacturing**

ACTIONS: Promote satellite assembly, testing and distribution facilities in Anchorage

GOAL: **Expansion of Fairbanks satellite ground station industry**

ACTIONS: Increase community awareness of industry

Increase outreach effort to industry

Encourage local value-added processing, manipulation and distribution of data

Investigate possibility of AADC-owned or State-owned processing facility

Satellite Manufacturing

In the past, AADC has worked closely with Allied Signal to promote satellite manufacturing in Anchorage. Both AADC and AS believe that Anchorage has the potential to become a hub for satellite manufacturing given its' central and accessible location from all parts of the world and Alaska's growing reputation as a strategic location for aerospace development. AADC has continued to pursue this business line over the past several years with both the Municipality of Anchorage and the Anchorage Economic Development Corporation. In 1999, AADC would like to position the building blocks necessary to make satellite manufacturing a reality in Anchorage.

Commercial Launch On Demand

The KLC, in conjunction with Lockheed Martin, has the opportunity to capture the polar constellation's replacement and replenishment launch market by offering Launch on Demand (LOD) capability, a process defined as the capability of a spaceport and launch provider to place a payload into the proper orbit within hours or days after notification. With a certain amount of failure expected during satellite constellation deployment there is no current plausible LOD plan to insure replacements in a timely manner. Corporations presently must launch non-operational, non-revenue producing spares with their initial constellation deployment. This stop-gap solution is expensive because the on-orbit spares, which must be paid for up-front as if they were operational, produce no revenues and begin deteriorating on-orbit due to the harsh environment.

LOD has already been recognized by AST as a valid

alternative to launching on-orbit spares. AST is in the process of developing a study that identifies existing spaceports' ability to support LOD; this study includes the development of a commercial LOD market, identification of customers and projected demand of LOD.

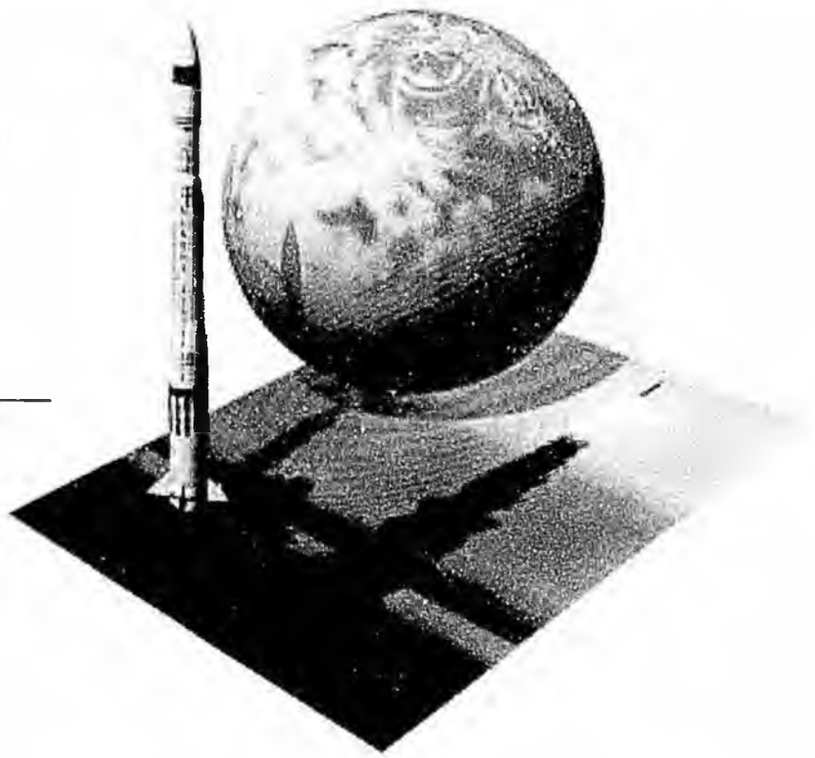
By constructing an additional launch pad to be dedicated to LOD within two years, the KLC can provide LOD capability to provide satellite constellations corporations the opportunity to defer large expenditures of funds. Placing a number of "ready-to-launch" payloads in environmental storage at the KLC would not require an additional payload processing facility.

AADC Bonding Capability

Pursuant to its enabling statute, AADC, with legislative approval, has the ability to issue bonds for aerospace related development. As such, AADC can complement its package of customer services by providing an alternate funding option for its customer base. For many customers, AADC's bonding capability will be an attractive capital alternative to standard up front payments or more traditional commercial loans. AADC will work with appropriate state agencies to explore structures wherein other agencies' bonding expertise and financial markets recognition complement the financial services AADC expects to provide its customers.

Foreign Trade Zone

The Kodiak Island Borough, with the assistance of AADC, has received approval from the federal government to designate the Kodiak Airport, Kodiak's dock facilities and the KLC site as a foreign trade zone. This will exempt foreign payloads and launch vehicles from customs duties otherwise imposed on those activities. As part of its ongoing strategic planning process, AADC is evaluating activation of the KLC's foreign trade zone site to enhance marketing efforts to international customers.



capital financial needs

Sources of Funds

As previously discussed, AADC has secured funds for the development of the KLC from numerous sources. The KLC project requires a total funding of $39,197,008. To date the project has received $27,809,958, which reflected the original project budget of $28 million.

The $28 million budget was developed by AADC using three independent cost estimates for facilities construction from its architectural-engineering firm, project management team, and an Anchorage cost-estimating firm. Due to a number of factors directly influenced by a delay in AADC's receipt of the $17.91 million in federal funds, bids received from potential construction contractors were above those anticipated by all of the independent cost estimates. Those factors include, but are not limited to, AADC's ability to initiate its procurement process and award a contract on schedule, escalation in the cost of construction materials during the period of delay, and premium charges associated with the accelerated construction schedule necessary to meet KLC launch commitments.

Due to these delay-induced cost escalations, the $28 million appropriated is not adequate to cover the cost of the complete facility, specifically, the launch tower and service structure. Construction of the KLC commenced, and AADC was able to secure it first government customer utilizing temporary launch pad facilities. Concurrently, AADC began seeking additional federal funding to complete construction of the permanent launch tower, which is essential to meet the needs of the commercial aerospace market.

As directed by its Board, AADC staff and management team completed an extensive review and cost to complete analysis of the construction of the KLC as well as cost to transition the facility into an operational mode. Based upon this analysis and a series of meetings, discussions and recommendations which followed, AADC developed an FY2000 Capital Budget request in the amount of $12 million. This budget request in addition to the original $28 million budget represents the total budget request for the KLC construction.

The budget request is comprised of up to $2 million in interest earnings on existing federal receipts and $5

FUNDING RECEIVED		AMOUNT
Alaska Science and Technology Foundation		$ 5,000,000
Federal (National Guard)		17,910,000
NASA Grant		4,899,958
	SUBTOTAL	*$ 27,809,958*
ADDITIONAL FUNDING SECURED		
Request, Federal		$ 4,800,000
Interest Earnings on National Guard Grant*		1,587,050
	SUBTOTAL	*$ 6,387,050*
FUNDING NEEDED		
FY 2000 State of Alaska Capital Budget Request**		$ 5,000,000
	SUBTOTAL	*$ 5,000,000*
	TOTAL	**$ 39,197,008**

* *Actual receipts may be less depending on whether or not granting agency retains funding for administration and the rate of return on investments for interest earnings. Future interest earnings projections are based on a conservative estimate of 4.75%.*

** *The FY2000 State of Alaska Capital Budget request provides a placeholder in the Administration's FY2000 Capital Budget and allows for multiple fund source opportunities to be considered.*

million in additional federal receipts which have been appropriated in the current federal budget. AADC is in the process of identifying the final $5 million funding component necessary for the completion of the construction effort.

In addition to the funding sources referred to above, AADC has also secured an in-kind contribution for an on-site range safety system estimated at $6.5 million.

AADC has prepared a Capital Budget Model, which anticipates the cash flow demand and timing requirements dictated by the on-going construction activity on the project. The discipline of managing encumbrances against funding sources reflects both the restricted nature of some funds to project components as well as the procurement discipline of having funds in-hand and legislative approval prior to commitment on contracts.

AADC will be seeking approval of the first $7 million identified in its $12 million capital request at the first scheduled meeting of the Legislative Budget and Audit Committee (LB&A) of the 1999 session. Approval by LB&A is critical in order for AADC to keep the launch tower construction effort on schedule. Upon receipt of approval by LB&A, AADC will reduce the capital budget request, accordingly, by $7 million and put forward the modified $5 million request for approval during the regular legislative session.

Uses of Funds

The following is a brief narrative on each of the budget categories utilized by the project team to both estimate the total capital budget and control the total capital budget.

Owner Administration: $865,247:
This budget category captures all past and future AADC organization administrative costs and expenses associated with overseeing the KLC capital program through June 2001.

Project Management: $1,070,102:
This budget category captures all past and future Rise Alaska labor and expenses associated with providing project management support services to AADC on the KLC project through December 1999.

Architect / Engineer Construction Administration: $1,645, 467:
This budget category captures all past and future BRPH labor and expenses associated with providing architecture and engineering construction administration services during the bidding and construction phase of KLC project through December 1999.

Construction: $28,993,654:
This budget category includes all general construction costs currently known for the completed KLC project including: Phase I Roads, Sitework and Utilities; Phase II Facilities; and Phase III Launch Tower.

Microwave Communications: $500,000:
This budget category includes all costs to build a Microwave Communications System to link the KLC to worldwide communications networks. A temporary communication system is currently being leased. Development and use of a permanent system will reduce ongoing monthly communications expenses to approximately 10% of the current cost. This one time project capital expense is scheduled for July 1999.

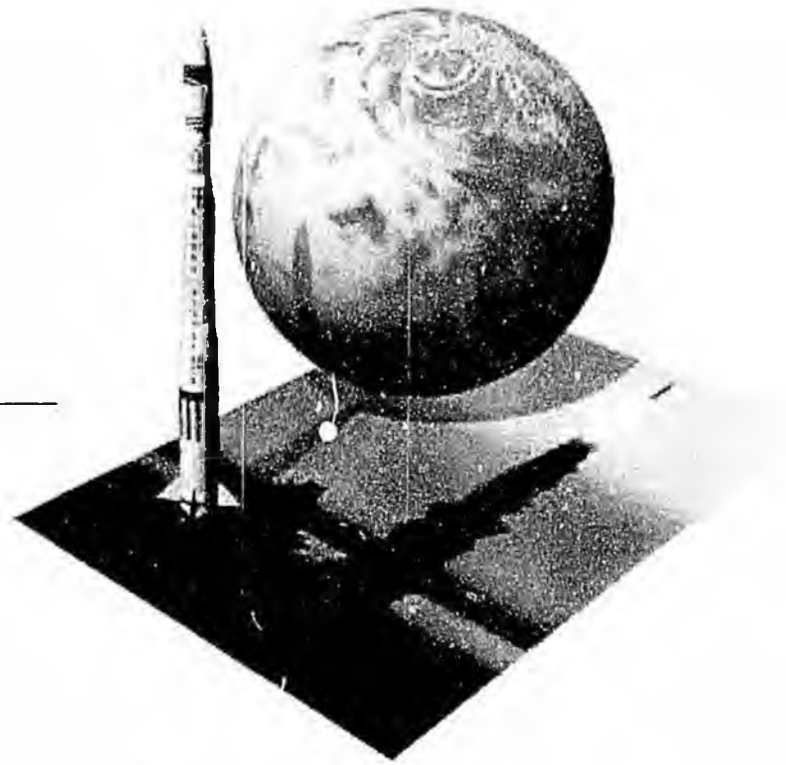
Project Infrastructure, FF&E: $1,644,555:
This budget category represents all furniture, fixtures and equipment, not contained within the general construction contracts, required for operation of the KLC. A significant portion of this total includes all fencing around each building as well as the costs associated with temporary communications until the microwave communications are established.

Operations Intercom System: $1,156,564:
This budget category captures all the past and future on-site operations intercom system (OIS) costs. The OIS allows for a fully integrated, multichannel, operations intercom system necessary to support a launch operation.

Working Capital: $1,000,000:
This budget category provides for a working line of capital to support the first few years of the operational start up of the KLC. As a start-up business consideration, working capital provides cash flow flexibility until the business line is firmly established and generating revenue to fully cover expenses.

Range Safety (in-kind) $6,500,000:
This budget category provides for an in-kind contribution of a permanent Range Safety System on-site. This project budget category is fully funded and managed external to the AADC project team, and does not require additional budget authority.

Program Contingency: $2,417,889:
This budget category provides for a contingency allocation of 9% against the unexpended balance of all project costs to complete as of January 1, 1999.



operational financial needs

Sources and Uses of Funds

AADC and its management team have prepared extensive economic analyses to assure the viability of the KLC. The KLC Provisional Operating Cost Model is proprietary in nature but available upon request and approval by AADC. Following is a summary of revenue and cost assumptions incorporated into the model:

Revenue and Expense Assumptions

Operating Revenues

The primary revenue source for AADC will be direct launch service fees charged to KLC customers as well as revenue generated by providing or managing secondary support services on per launch basis. The *KLC Facilities and Operations* section outlines the basic launch services package provided to KLC customers and a list of other optional services available. AADC also has traditionally received funding from interest earned by the Alaska Science and Technology Foundation as well as corporate receipts to support its annual operating budget. As a state agency, all revenue receipts and expenditures are subject to appropriation by the Alaska State Legislature.

Operating Expenses

The expense section of the operating model is comprised of AADC Administration, KLC Launch Operations, and Funded Reserves. Following is a brief narrative on each of the categories developed by the AADC management team.

AADC Administration

This category represents AADC's annual operating budget which includes all staffing, travel, contractual services, supplies and equipment costs associated with management and operation of AADC. AADC's operating budget submittal for the fiscal year 2000 has been approved by the Board of Directors at $823,400. This budget reflects an increase from the current budget which includes adding two new positions to the organization. These positions are necessary as AADC transitions from construction to operation of the KLC and includes the addition of the KLC Site Manager.

KLC Operations
This category represents all costs directly associated with providing launch services from and maintenance of the KLC facilities. Descriptions of the primary components of this category are provided below.

Facility Operations:
This component represents fixed costs that AADC will incur in maintaining the KLC when no launch operations are occurring, including security, intermittent checks of all systems, minor maintenance, groundskeeping and administrative tasks relating to the KLC's permits, licenses, funding, contracting and other matters.

These followings services initially will be provided by contractors to AADC and will include the following:

- Security - includes a single guard to be on site an average of half-time during peak launch operations and in addition to random site visits complemented by remote monitoring during non-peak operations.
- Maintenance Activities - includes minor repairs to facilities and equipment, painting, janitorial, groundskeeping and similar activities
- Insurance - includes insuring the KLC site and facilities
- Administrative Expenses - includes insurance and legal and accounting expenses for matters relating to maintaining the KLC
- Utility Expenses - includes electricity, fuel and communications expenses

Engineering Support:
AADC will require engineering and technical support to run and maintain the KLC. This subcontractor support is also necessary to complete user documentation and interface with potential customers by identifying specific service requirements, insuring mission/facility compatibility, and facilitating contract negotiation on a technical level. AADC plans to utilize subcontractor support to offer the maximum level of flexibility to support customers on a per launch basis and to adjust the level of year-round support as needed to accommodate the AADC launch schedule.

Launch Operations:
Launch Operations Costs are those costs incurred by AADC during launch operations which are not passed on to the customer. These variable costs depend on the number of launches performed each year.

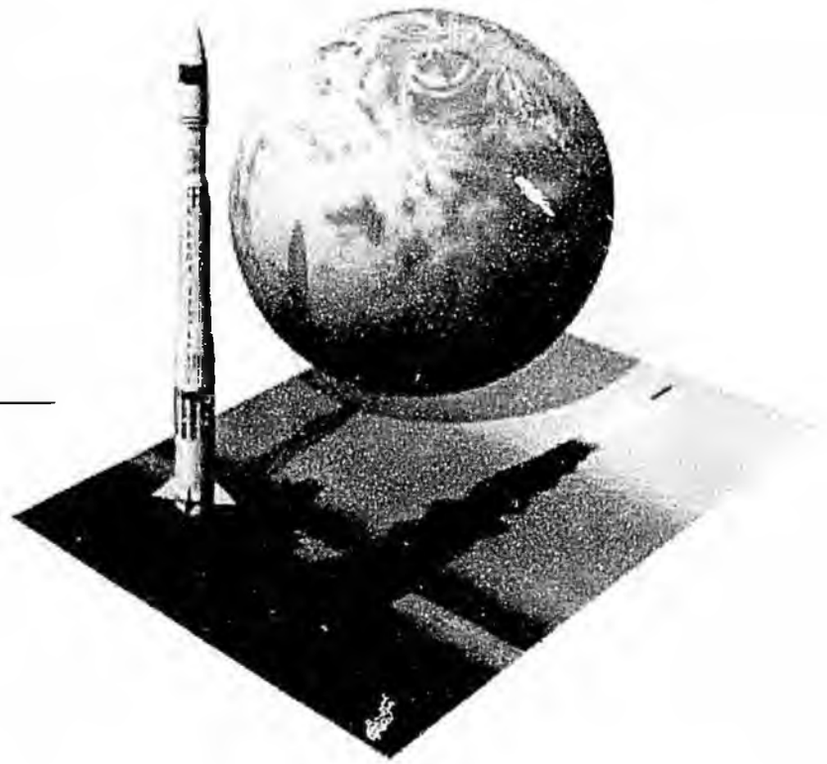
- Medical and Environmental Health - paramedic support
- Site Vehicles - cost of vehicle rental by AADC staff and contractors
- Site Restoration - includes painting, cleanup, and restoration of the launch pad and service structure
- Janitorial Services - includes waste disposal and cleanup
- Fire Protection
- Non-hazardous Waste Containment and Disposal
- Utilities – includes primary power and backup generators

AADC launch customers will also incur launch operation expenses for which they will be directly responsible. The optional services will be outside the scope of the basic services and support offered by AADC and will be negotiated in the launch services agreement.

Funded Reserves
AADC has built into its Provisional Operating Model three funded reserves to safeguard against any unforeseen revenue decreases or expense increases: (i) operating reserve; (ii) maintenance reserve; and (iii) capital reserve. There is a fourth reserve to provide capital for the potential cost of a future dismantling of the site in the event future launch technologies would no longer warrant use and further development of the KLC. Pursuant to the State of Alaska's 1994 Interagency Land Management Assignment to AADC, the Corporation must, at the end of its 30 year term, or later if term is renewed, return the land in an acceptable condition, which may include rehabilitation of the site, and/or removal of any improvements, equipment and materials. The site de-mobilization reserve will be funded by a percentage of launch fees once the KLC has maintained a positive net cash flow.

The Capital Model also provides a Working Capital Liquidity Fund to provide cash flow flexibility until the business line is firmly established and generating revenue to fully cover expenses. The Funded Reserves,

in conjunction with the Working Capital Liquidity Fund, provide AADC with an essential tool necessary to provide prudent and responsible capital management.



appendices

A. Abbreviations

B. Capital Funding Model

C. Support Documents

Appendix A — Abbreviations

AADC	Alaska Aerospace Development Corporation
AFB	Air Force Base
AIDEA	Alaska Industrial Development and Export Authority
ait	Atmospheric Interceptor Technology
AK DOT&PF	Alaska Department of Transportation & Public Facilities
AST	Office of the Associate Administrator for Commercial Space Transportation ASTF Alaska Science & Technology Foundation
BMDO	Ballistic Missile Defense Organization
B&R	Brown & Root Environmental
BRPH	BRPH Architects • Engineers, Inc.
CCSI	California Commercial Spaceport, Inc.
CNES	Centre National D'Etudes Spatiales (French Space Agency)
DCED	Alaska Department of Commerce and Economic Development
DoD	U.S. Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	European Space Agency/Arianespace
ENRI	UA Anchorage Environment and Natural Resources Institute
EOSAT	Earth Observation Satellite Company
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FSS	Fixed Service Structure
GATT	General Agreement on Tariffs and Trade
GPS	Global Positioning System
GSC	Guiana Space Center
IPF	Integration and Processing Facility
ISER	Institute of Social and Economic Research
ITU	International Telecommunications
KLC	Kodiak Launch Complex
LB&A	Legislative, Budget & Audit
LCC	Launch Control and Management Center
LCS	Launch Control System
LEO	Low Earth Orbit
LMC	Lockheed Martin Corporation
LOD	Launch On Demand
LP	Launch Pad
MSS	Mobile Satellite Service
MSTI	Miniature Sensor Technology Integration
NASA	National Aeronautical and Space Administration
NEPA	National Environmental Policy Act
NMD	National Missile Defense
NOAA	National Oceanic and Atmospheric Administration
NSC	Norwegian Space Center
OIS	Operational Intercom System
PFRR	Poker Flat Research Range
PPF	Payload Processing Facility
PTI	PTI Communications
RSD	Rotation Service Door
RSLP	Rocket System Launch Program
RSS	Rotating Service Structure
RTI	Research Triangle Institute
SCAT	Spacecraft and Assemblies Transfer Facility
SDIO	Strategic Defense Initiative Organization
SSI	Spaceport Systems International
STA	Space Transportation Association
UA	University of Alaska
UAF	University of Alaska Fairbanks
UAH	University of Alabama in Huntsville
VAFB	Vandenberg Air Force Base
VCL	Vegetation Canopy Lidar
WCSC	Western Commercial Space Center
WFF	Wallops Flight Facility

Appendix B — Capital Funding Model

CAPITAL PROJECT CASH FLOWS

	Starting Balance	Actual Funding Feb-98	Mar-98	Apr-98	May-98	Jun-98	FY-98 TOTAL	Jul-98
Revenue								
ASTF Grant	$5,000,000.00						$5,000,000.00	
Federal Funding	$18,110,000.00						$18,110,000.00	
NASA PPF Grant	$4,899,958.00						$4,899,958.00	
Federal Funding for Tower	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
State Appropriation	$0.00						$0.00	
AADC Corp. Receipts (Bond Proceeds)	$0.00						$0.00	
AADC Corp. Receipts (Interest Earnings)	$0.00						$0.00	
Non-Cash/In-Kind Receipts	$0.00						$0.00	
Total CPCF Gross Revenue	$28,009,958.00	$0.00	$0.00	$0.00	$0.00	$0.00	$28,009,958.00	$0.00
EXPENDITURES								
Project Owner Admin		$91,453.00	$10,546.00	$8,037.00	$1,644.00	$6,331.00	$124,011.00	$63,305.55
Rise Alaska		$83,871.40	$29,336.20	$29,207.71	$56,392.86	$65,670.12	$264,478.29	$76,123.13
BRPH		$53,830.29	$0.00	$166,890.37	$167,318.86	$84,577.29	$472,616.81	$90,989.35
Project Infrastructure Support (FF&E)		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
PTI Communications (Temporary)		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Phase I AK Contract		$200,079.66	$313,790.76	$497,670.75	$222,649.88	$400,277.68	$1,640,468.73	$158,486.04
Phase II Red Sam Contract		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$821,250.00
OIS Contract		$0.00	$0.00	$0.00	$0.00	$523,334.00	$523,334.00	$50,920.25
Total		$435,234.35	$359,672.96	$701,805.83	$448,005.60	$1,080,190.09	$3,024,908.83	$1,261,074.32
Contingency								
BRPH							$0.00	
Phase I AK Contract		$0.00	$0.00	$0.00	$0.00	$16,437.57	$16,437.57	$188,985.89
Phase II Red Sam Contract		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Contingency		$0.00	$0.00	$0.00	$0.00	$16,437.57	$16,437.57	$188,985.89
PROJECTIONS								
Project Owner Administration							$0.00	
Project Infrastructure Support (FF&E)							$0.00	
RISE Contract							$0.00	
BRPH							$0.00	
PTI Communications (Temporary)							$0.00	
PTI Communications (Microwave)							$0.00	
Working Capital							$0.00	
Total AADC/RISE Projections	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
BRPH Projections								
Phase I AK Contract							$0.00	
Phase II Red Sam Contract							$0.00	
Phase III Tower Contract							$0.00	
OIS Contract							$0.00	
Total BRPH Projections	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Contingency Projections								
Phase I AK Contract								
Phase II Red Sam Contract								
Phase III Tower Contract								
OIS Contract								
Total Category G	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Non-Cash Expenditures								
Range Safety System (in-kind value)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total CPCF Expenses	$0.00	$435,234.35	$359,672.96	$701,805.83	$448,005.60	$1,126,627.66	$3,071,346.40	$1,450,060.21
9% Contingency on Remaining Exp.								
Net Capital Project Cash Flow	$28,009,958.00	-$435,234.35	-$359,672.96	-$701,805.83	-$448,005.60	-$1,126,627.66	-$3,071,346.40	-$1,450,060.21
Total Capital Project Cash Balance (Cum.)		$27,574,723.65	$27,215,050.69	$26,513,244.86	$26,065,239.26	$24,938,611.60		$23,488,551.39

Appendix B — Capital Funding Model

CAPITAL PROJECT CASH FLOWS

	Aug-98	Sep-98	Oct-98	Nov-98	Projected Capital Funding Dec-98	Jan-99	Feb-99	Mar-99	Apr-99
Revenue									
ASTF Grant									
Federal Funding									
NASA PPF Grant									
Federal Funding for Tower	$0.00	$0.00	$0.00	$0.00	$0.00	$4,800,000.00	$0.00	$0.00	$0.00
State Appropriation									
AADC Corp. Receipts (Bond Proceeds)									
AADC Corp. Receipts (Interest Earnings)						$1,155,045.43	$50,847.00	$50,885.00	$47,613.00
Non Cash/In-Kind Receipts									$6,500,000.00
Total CPCF Gross Revenue	$0.00	$0.00	$0.00	$0.00	$0.00	$5,955,045.43	$50,847.00	$50,885.00	$6,547,613.00
EXPENDITURES									
Project Owner Admin	$37.00	$12,261.18	$12,633.45	$9,303.26					
Riso Alaska	$49,364.78	$33,833.00	$24,173.00	$88,454.74					
BRPH	$0.00		$168,208.70	$92,989.35					
Project Infrastructure Support (FF&E)	$0.00	$0.00	$0.00	$0.00	$0.00				
PTI Communications (Temporary)	$0.00	$0.00	$0.00	$60,230.74					
Phase I AK Contract	$201,748.36		$194,950.31	$90,801.55					
Phase II Red Sam Contract	$0.00	$2,627,460.00	$2,185,570.00	$0.00			$0.00		
OIS Contract	$0.00	$0.00	$0.00	$0.00					
Total	$331,150.15	$2,673,554.18	$2,585,536.36	$370,869.64	$0.00	$0.00	$0.00	$0.00	$0.00
Contingency									
BRPH									
Phase I AK Contract	$214,878.95		$22,577.90	$15,284.30					
Phase II Red Sam Contract	$0.00						$0.00		
Total Contingency	$214,878.95	$0.00	$22,577.90	$15,284.30	$0.00	$0.00	$0.00	$0.00	$0.00
PROJECTIONS									
Project Owner Administration					$10,000.00	$29,348.00	$15,000.00	$5,000.00	$5,000.00
Project Infrastructure Support (FF&E)					$0.00	$0.00	$0.00	$0.00	$0.00
RISE Contract					$4,447.26	$46,451.00	$46,451.00	$46,451.00	$46,451.00
BRPH					$89,177.71	$82,989.35	$92,989.35	$82,989.35	$82,989.35
PTI Communications (Temporary)					$14,532.42	$14,532.42	$14,532.42	$14,532.42	$14,532.42
PTI Communications (Microwave)					$0.00	$0.00	$0.00	$0.00	$0.00
Working Capital					$0.00	$0.00	$0.00	$0.00	$0.00
Total AADC/RISE Projections	$0.00	$0.00	$0.00	$0.00	$118,157.39	$173,320.77	$158,972.77	$148,972.77	$148,972.77
BRPH Projections									
Phase I AK Contract					$106,025.70	$0.00	$0.00	$0.00	$0.00
Phase II Red Sam Contract					$4,978,577.00	$1,417,849.00	$1,230,649.00	$412,549.00	$303,649.00
Phase III Tower Contract					$335,000.00	$705,000.00	$750,000.00	$650,000.00	$700,000.00
OIS Contract					$0.00	$14,800.00	$88,435.00	$60,075.00	$369,000.00
Total BRPH Projections	$0.00	$0.00	$0.00	$0.00	$5,419,602.70	$2,137,649.00	$2,069,084.00	$1,122,624.00	$1,372,649.00
Contingency Projections									
Phase I AK Contract					$185,237.15	$0.00	$0.00	$0.00	$0.00
Phase II Red Sam Contract					$59,901.00	$23,636.00	$0.00	$0.00	$0.00
Phase III Tower Contract					$0.00	$0.00	$0.00	$0.00	$0.00
OIS Contract					$0.00	$0.00	$0.00	$0.00	$0.00
Total Category G	$0.00	$0.00	$0.00	$0.00	$245,141.15	$23,636.00	$0.00	$0.00	$0.00
Non-Cash Expenditures									
Range Safety System (in-kind value)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6,500,000.00
Total CPCF Expenses	$546,027.10	$2,673,554.18	$2,608,114.26	$386,153.94	$5,782,901.24	$2,364,605.77	$2,228,056.77	$1,271,596.77	$8,021,621.77
9% Contingency on Remaining Exp.						$212,814.52	$200,525.11	$114,443.71	$721,945.96
Net Capital Project Cash Flow	-$546,027.10	-$2,673,554.18	-$2,608,114.26	-$386,153.94	-$5,782,901.24	$3,377,625.14	-$2,371,734.88	-$1,335,155.48	-$2,195,954.73
Total Capital Project Cash Balance (Cum.)	$22,042,524.20	$20,268,970.11	$17,660,855.85	$17,274,701.91	$11,491,800.67	$14,869,425.81	$12,497,690.93	$11,162,535.45	$8,966,580.72

Appendix B — Capital Funding Model

CAPITAL PROJECT CASH FLOWS

	May-99	Jun-99	FY-99 TOTAL	Jul-99	Aug-99	Sep-99	Oct-99	Nov-99	Dec-99
Revenue									
ASTF Grant			$0.00						
Federal Funding			$0.00						
NASA PPF Grant			$0.00						
Federal Funding for Tower	$0.00	$0.00	$4,800,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
State Appropriation			$0.00						
AADC Corp. Receipts (Bond Proceeds)			$0.00						
AADC Corp. Receipts (Interest Earnings)	$43,654.00	$41,970.00	$1,396,014.43	$38,282.00	$33,261.00	$27,319.00	$22,774.00	$16,792.00	$14,108.00
Non-Cash/In-Kind Receipts			$6,500,000.00						
Total CPCF Gross Revenue	**$43,654.00**	**$41,970.00**	**$12,696,014.43**	**$38,282.00**	**$33,261.00**	**$27,319.00**	**$22,774.00**	**$16,792.00**	**$14,108.00**
EXPENDITURES									
Project Owner Admin			$97,540.44						
Riso Alaska			$271,949.56			$0.00	$0.00		
BRPH			$312,187.40						
Project Infrastructure Support (FF&E)			$0.00						
PTI Communications (Temporary)			$99,230.74						
Phase I AK Contract			$726,078.26						
Phase II Red Sam Contract	$0.00		$5,634,280.00						
OIS Contract			$50,920.25						
Total	**$0.00**	**$0.00**	**$7,222,184.65**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Contingency									
BRPH			$0.00						
Phase I AK Contract			$441,725.04						
Phase II Red Sam Contract	$0.00		$0.00						
Total Contingency	**$0.00**	**$0.00**	**$441,725.04**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
PROJECTIONS									
Project Owner Administration	$5,000.00	$5,000.00	$74,348.00	$230,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00
Project Infrastructure Support (FF&E)	$0.00	$0.00	$0.00	$233,333.33	$233,333.33	$233,333.33	$233,333.33	$233,333.33	$233,333.33
RISE Contract	$46,451.00	$46,451.00	$283,153.26	$46,451.00	$46,451.00	$46,451.00	$40,000.00	$40,000.00	$39,168.56
BRPH	$82,989.35	$76,800.33	$580,930.79	$71,348.00	$71,348.00	$71,348.00	$35,688.00	$0.00	$0.00
PTI Communications (Temporary)	$14,532.42	$14,532.42	$101,726.94	$14,532.42	$14,532.42	$14,532.42	$0.00	$0.00	$0.00
PTI Communications (Microwave)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$500,000.00	$0.00	$0.00
Working Capital	$0.00	$0.00	$0.00	$1,000,000.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total AADC/RISE Projections	**$148,972.77**	**$142,789.75**	**$1,040,158.99**	**$1,595,664.75**	**$370,664.75**	**$370,664.75**	**$814,021.33**	**$278,333.33**	**$277,501.89**
BRPH Projections									
Phase I AK Contract	$0.00	$0.00	$100,025.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Phase II Red Sam Contract	$129,049.00	$783,700.00	$9,256,022.00	$1,141,900.00	$106,200.00	$51,598.00	$0.00	$0.00	$0.00
Phase III Tower Contract	$2,507,700.00	$800,000.00	$6,447,700.00	$500,000.00	$800,000.00	$800,000.00	$300,000.00	$100,000.00	$0.00
OIS Contract	$19,999.75	$0.00	$582,309.75	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total BRPH Projections	**$2,656,748.75**	**$1,583,700.00**	**$16,392,057.45**	**$1,641,900.00**	**$906,200.00**	**$851,598.00**	**$300,000.00**	**$100,000.00**	**$0.00**
Contingency Projections									
Phase I AK Contract	$0.00	$0.00	$185,237.15	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Phase II Red Sam Contract	$0.00	$626,443.19	$709,983.19	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Phase III Tower Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
OIS Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total Category G	**$0.00**	**$626,443.19**	**$895,220.34**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
Non-Cash Expenditures									
Range Safety System (in-kind value)	$0.00	$0.00	$6,500,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total CPCF Expenses	**$2,805,721.52**	**$2,352,932.94**	**$32,491,348.47**	**$3,237,564.75**	**$1,276,864.75**	**$1,222,262.75**	**$1,114,021.33**	**$378,333.33**	**$277,501.89**
9% Contingency on Remaining Exp.	**$252,514.94**	**$211,763.96**	**$1,714,006.20**	**$291,380.83**	**$114,917.83**	**$110,003.65**	**$100,261.92**	**$34,050.00**	**$24,975.17**
Net Capital Project Cash Flow	**$3,014,582.46**	**-$2,522,726.90**	**-$21,509,340.24**	**-$1,490,663.58**	**-$1,358,521.58**	**-$1,304,947.40**	**-$1,191,509.25**	**-$395,591.33**	**-$268,369.06**
Total Capital Project Cash Balance (Cum.)	**$5,051,998.27**	**$3,429,271.36**		**-$61,392.22**	**-$1,419,913.79**	**-$2,724,861.19**	**-$3,916,370.44**	**-$4,311,961.77**	**-$4,600,330.83**

Appendix B — Capital Funding Model

CAPITAL PROJECT CASH FLOWS

	Jan-00	Feb-00	Mar-00	Apr-00	May-00	Jun-00	FY-00 TOTAL	FY-01 TOTAL	FY-02 Total	Project Total
Revenue										
ASTF Grant							$0.00	$0.00	$0.00	95,531
Federal Funding							$0.00	$0.00	$0.00	19,110,000
NASA PPF Grant							$0.00	$0.00	$0.00	4,899,958
Federal Funding for Tower	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	4,800,000
State Appropriation							$0.00	$0.00	$0.00	0
AADC Corp. Receipts (Bond Proceeds)							$0.00	$0.00	$0.00	0
AADC Corp. Receipts (Interest Earnings)	$10,870.00	$10,783.00	$8,407.00	$8,440.00			$191,036.00	$0.00	$229,536.00	1,587,050
Non-Cash/In-Kind Receipts							$0.00	$0.00	$0.00	6,500,000
Total CPCF Gross Revenue	**$10,870.00**	**$10,783.00**	**$8,407.00**	**$8,440.00**	**$0.00**	**$0.00**	**$191,036.00**	**$0.00**	**$229,536.00**	**40,897,098**
EXPENDITURES										
Project Owner Admin							$0.00	$0.00	$0.00	221,551
Rise Alaska							$0.00	$0.00	$0.00	536,428
BRPH							$0.00	$0.00	$0.00	814,801
Project Infrastructure Support (FF&E)							$0.00	$0.00		0
PTI Communications (Temporary)							$0.00	$0.00		99,231
Phase I AK Contract							$0.00	$0.00	$0.00	2,366,545
Phase II Red Sam Contract							$0.00	$0.00	$0.00	5,631,280
OIS Contract							$0.00	$0.00	$0.00	574,254
Total	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**10,247,093**
Contingency										
BRPH							$0.00	$0.00		0
Phase I AK Contract							$0.00	$0.00	$0.00	488,163
Phase II Red Sam Contract							$0.00	$0.00	$0.00	0
Total Contingency	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**488,163**
PROJECTIONS										
Project Owner Administration	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$285,000.00	$284,347.33	$0.00	643,695
Project Infrastructure Support (FF&E)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,399,999.98	$0.00	$0.00	1,400,000
RISE Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$258,521.56	$0.00	$0.00	541,675
BRPH	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$249,732.00	$0.00	$0.00	830,663
PTI Communications (Temporary)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$43,597.26	$0.00	$0.00	145,324
PTI Communications (Microwave)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$500,000.00	$0.00	$0.00	500,000
Working Capital	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,000,000.00	$0.00	$0.00	1,000,000
Total AADC/RISE Projections	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$3,736,850.80**	**$284,347.33**	**$0.00**	**5,061,357**
BRPH Projections										
Phase I AK Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	106,028
Phase II Red Sam Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,299,698.00	$0.00	$0.00	10,555,720
Phase III Tower Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,500,000.00	$0.00	$0.00	8,947,700
OIS Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	582,310
Total BRPH Projections	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$3,799,698.00**	**$0.00**	**$0.00**	**20,191,755**
Contingency Projections										
Phase I AK Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	185,237
Phase II Red Sam Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	709,983
Phase III Tower Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0
OIS Contract	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0
Total Category G	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**895,220**
Non-Cash Expenditures										
Range Safety System (in-kind value)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	6,500,000
Total CPCF Expenses	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$5,000.00**	**$7,536,548.80**	**$284,347.33**	**$0.00**	**43,383,589**
9% Contingency on Remaining Exp.	**$450.00**	**$450.00**	**$450.00**	**$450.00**	**$450.00**	**$450.00**	**$678,289.39**	**$25,591.26**	**$0.00**	**2,417,889**
Net Capital Project Cash Flow	**$5,420.00**	**$5,333.00**	**$2,957.00**	**$2,990.00**	**-$5,450.00**	**-$5,450.00**	**-$8,023,602.19**	**-$309,938.59**	**$229,536.00**	
Total Capital Project Cash Balance (Cum.)	**-$4,994,910.83**	**-$4,589,577.83**	**-$4,586,620.83**	**-$4,583,630.83**	**-$4,589,080.83**	**-$4,594,530.83**		**-$4,904,469.42**	**-$4,904,469.42**	

Appendix C — Support Documents

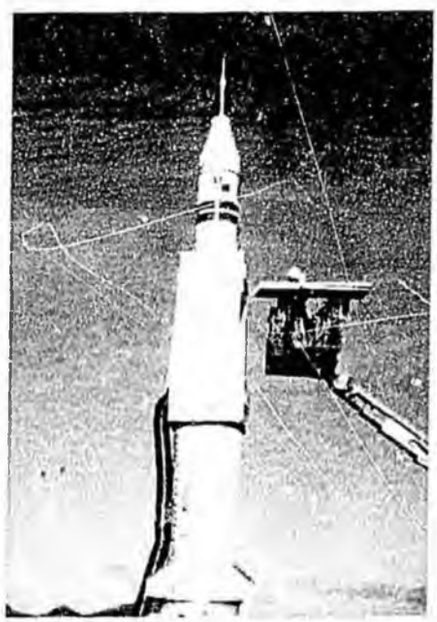
Permitting and Licensing Documentation

1. Department of Natural Resources Interagency Land Management Agreement
2. Division of Government Coordination Consistency Determination for KLC
3. US Army Corps of Engineers Wetlands Permit
4. Kodiak Island Borough Conditional Use Permit
5. Environmental Baseline of Narrow Cape, 1995
6. Environmental Baseline Supplemental Survey, 1998
7. Environmental Assessment of KLC, 1996
8. Biological Assessment, 1998
9. Environmental Assessment by US Air Force, 1998
10. Site Operator License Application, 1998
11. KLC Site Operator License, 1998
12. National Resources Management Plan, 1998
13. Memorandum of Agreement with the FAA, 1998
14. Memorandum of Agreement with the US Coast Guard, 1998

Separate Support Documents

1. 1995 AADC Business Plan
2. 1997 Business and Financial Summary
3. 1993 Annual Report (with audited financial statements)
4. 1994 Annual Report (with audited financial statements)
5. 1995 Annual Report (with audited financial statements)
6. 1996 Annual Report (with audited financial statements)
7. 1997 Annual Report (with audited financial statements)
8. 1998 Annual Report (with audited financial statements)

Documents available by request at the administrative offices of AADC or applicable agency.



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