FIREFLY AEROSPACE

FIREFLY FLTA002 THE BLACK

FLTA002 TO THE BLACK

Press Kit, September 2022

MAKING SPACE FOR EVERYONE

FIREFLY AEROSPACE

MISSION DETAILS

To The Black Mission

Alpha Flight 2: To The Black is Firefly's second technology demonstration flight that will attempt to launch multiple satellites to low Earth orbit (LEO) from our launch site (SLC-2) at Vandenberg Space Force Base. Alpha will first insert into an elliptical transfer orbit, coast to apogee, and perform a circularization burn.

VIEW LIVE STREAM

FLTA002 | TO THE BLACK

PRIMARY LAUNCH WINDOW
September 30, 2022
00:01-2:00 PDT

BACKUP LAUNCH WINDOW
October 1, 2022
00:01-2:00 PDT

MISSION NAME
FLTA002 | To The Black

ROCKET
Alpha

LAUNCH LOCATION
SLC-2 Vandenberg Space Force Base, USA

TARGET ORBIT

TOTAL PAYLOAD MASS
Approx. 35 kg

LAUNCH AZIMUTH
240° CW from North

PAYLOAD DESTINATION ALTITUDE
300 km

PAYLOAD DESTINATION INCLANATION
137 deg

VIEWING

Launch will be live streamed by **Tim Dodd**, **Everyday Astronaut,** starting approximately T-60 minutes

BOOKING LAUNCH@FIREFLY.COM

FIREFLY AEROSPACE

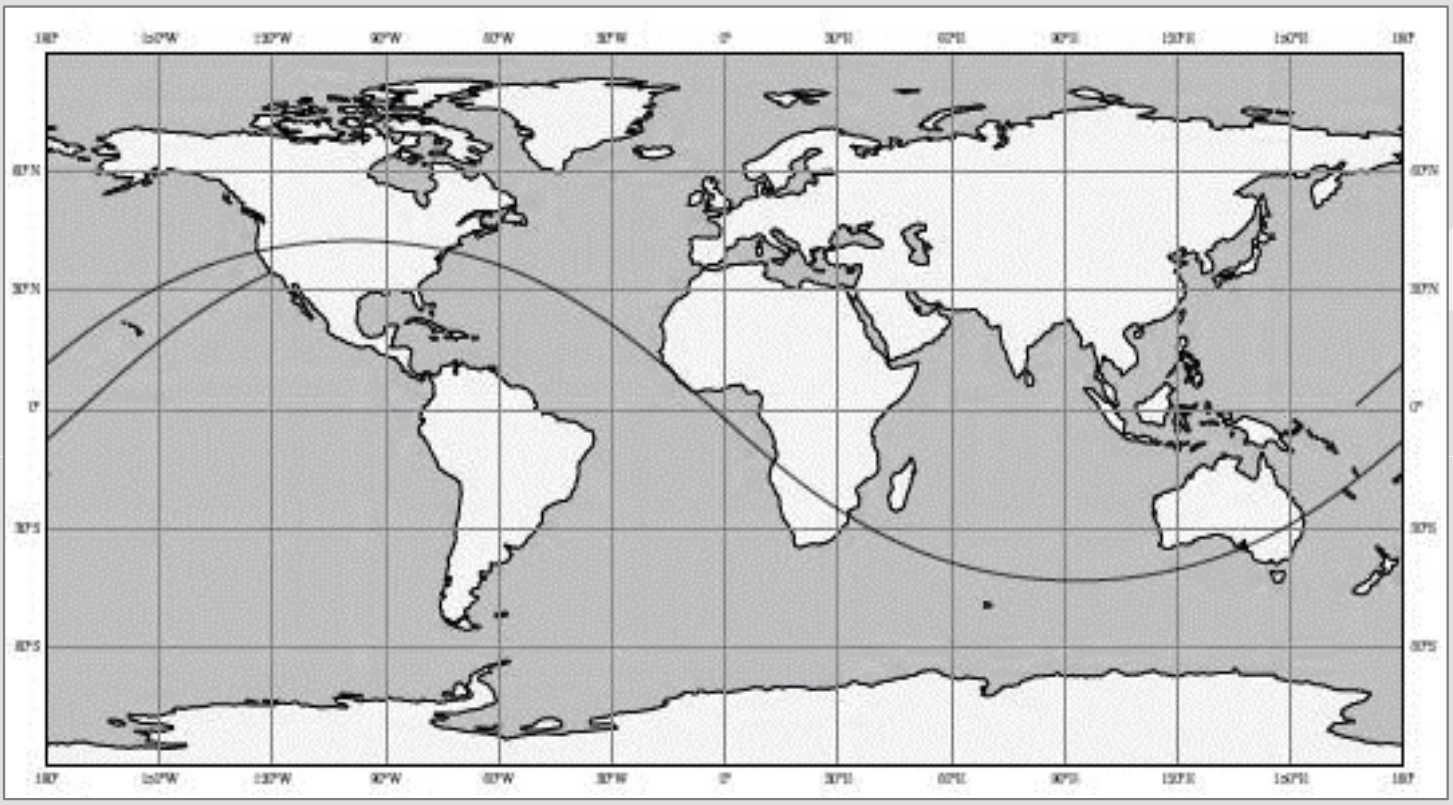
LOCATION

To The Black Launch

Firefly conducts Polar and SSO launches to high inclinations from SLC-2 at Vandenberg AFB, California. Figure below shows ground track for FLTA002's retrograde orbit and launch azimuths from VAFB. Other orbit inclinations may be possible, inquire with Firefly for additional details.

SLC-2, Vandenburg Space Force Base, CA

PACIFIC OCEAN

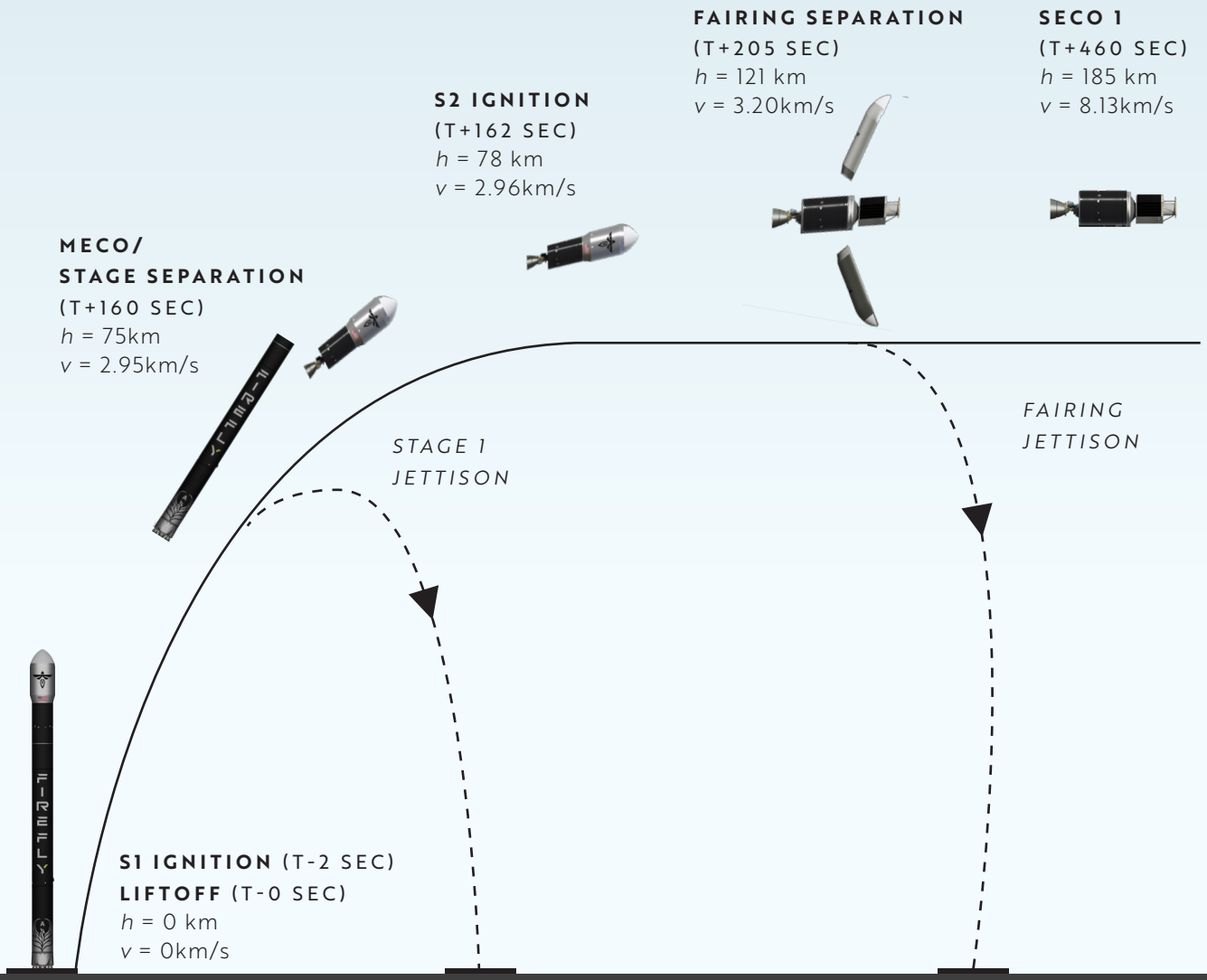


BOOKING LAUNCH@FIREFLY.COM

FIREFLY AEROSPACE

LAUNCH

Ascent Phase



FIREFLY AEROSPACE

ABOUT

ALPHA

Firefly Alpha is designed to address the needs of the burgeoning small-satellite market.

At a dedicated mission price of $15M, Alpha combines the highest payload performance with the lowest cost per kilogram to orbit in its vehicle class.

Capable of delivering 1 metric ton to Low Earth Orbit (LEO) and 630 kg to the highly desirable 500 km Sun-Synchronous Orbit (SSO), Alpha will provide launch options for both.

PERFORMANCE

PAYLOAD LEO
1,170 KG
LEO 28.5°, 200 km

PAYLOAD SSO
745 KG
SSO, 500 km

DIMENSIONS

STAGE 1 DIAMETER
1.8 m
6 ft

STAGE 2 DIAMETER
1.8 m
6 ft

PAYLOAD FAIRING DIAMETER
2 m
6.6 ft

OVERALL LENGTH
29.48 m
95 ft

PROPULSION STAGE 1

ENGINE
4x Reaver 1

PROPELLANT
LOX / RP-1

PROPELLANT FEED
Turbopump

COMBUSTORS
4

THRUST (VAC)
736.1 kN
165,482 lbf

ISP (VAC)
295.6 sec

PROPULSION STAGE 2

ENGINE
1x Lightning 1

PROPELLANT
LOX / RP-1

PROPELLANT FEED
Turbopump

COMBUSTORS
1

THRUST (VAC)
70.1 kN
15,759 lbf

ISP (VAC)
322 sec

BOOKING LAUNCH@FIREFLY.COM

FIREFLY AEROSPACE

ABOUT

ALPHA

Payload Fairing
Carbon Composite Structure
All Pneumatic Low Shock Fairing Separation

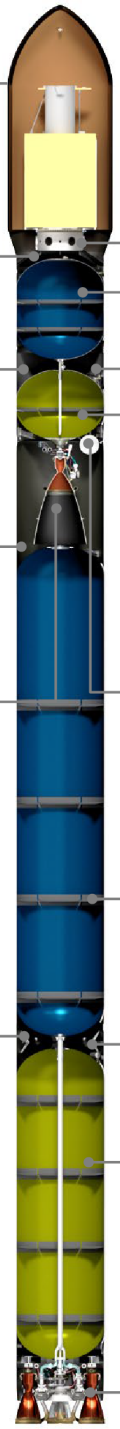
Payload Attach Fitting (PAF)
38.81" Bolt Circle Interface

Stage 2 Avionics
Flight Computer
S-Band Transmitters
GPS/IMU Navigation
Power Conditioning & Distribution Unit (PCDU)
Data Acquisition Chassis (DAC)
Lithium Polymer Batteries
Flight Termination System

Interstage
Hot Gas Stage Separation
Carbon Composite

Stage 2 Lightning Engine
Qty Engines: 1
Propellant: LOX/RP-1
Thrust: 70 kN [15.7 klbf] (vac)
Isp: 322 seconds (vac)

Stage 1 Avionics
Power Conditioning & Distribution Unit (PCDU)
Data Acquisition Chassis (DAC)
Lithium Polymer Batteries



Standardized Secondary
Payload Adapter
6 Ports with 8" Bolt Grcle Interface

Stage 2 LOX Tank
All Composite Construction
Design MEOP 65 psi

Stage 2 Helium Tank
Aluminum Liner
Design MEOP 5500 psi

Stage 2 Fuel Tank
All Composite Construction
Design MEOP 55 psi

Stage 2 Nitrogen Tank
Aluminum Liner
Design MEOP 5500 psi

Stage 1 LOX Tank
All Composite Construction
Design MEOP 70 psi

Stage 1 Helium Tanks
Qty Tanks: 4
Aluminum Liner
Design MEOP 5500 psi

Stage 1 Fuel Tank
All Composite Construction
Design MEOP 75 psi

Stage 1 Reaver Engine
Qty Engines: 4
Propellant: LOX/RP1
Thrust: 801 kN [180 klbf] (vac)
Isp: 296 seconds (vac)

Payload Segment
5.21 m [17.09 ft]

Stage 2
[5.37 m [17.62 ft]

Stage 1
18.9m [62.02 ft]

Alpha Launch Vehicle
GLOW 54,120 kg [119,314 lbm]
Height 29.48 m [96.7 ft]
Stage 1 Dry Mass 2,895 kg [6,382 lbm]
Stage 2 Dry Mass 909 kg [2,006 lbm]

DAY OF

Launch Schedule

HH:MM:SS from Lift Off	Events
T-08:00:00	Final Pad Checkouts
T-07:00:00	Power up of Alpha
T-06:50:00	Sensor Checks
T-06:00:00	Helium Load Begins
T-05:15:00	Fuel Load Begins
T-04:30:00	Pad Clear
T-03:40:00	LOx Load Begins
T-00:20:00	Terminal Count
T-00:00:01.79	Ignition of Stage 1
T+00:00:00	**Lift Off!**
T+00:01:13	Maximum Aerodynamic Pressure (MaxQ)
T+00:02:37	Main Engine Cut Off (MECO)
T+00:02:40	Stage Separation
T+00:02:42	Stage 2 Ignition
T+00:03:25	Fairing Jettison
T+00:07:40	Second Engine Cut Off #1 (SECO 1)
T+00:53:37	Stage 2 Ignition #2
T+00:53:39	Second Engine Cut Off #2 (SECO 2)
T+00:59:57	Serenity Deploy
T+01:00:57	TES-15 Deploy
T+01:01:57	PICOBUS Deploy

PAYLOADS

FLTA002 | To The Black

The payloads will be placed inside the Alpha payload fairing on top of our Space Utility Vehicle (SUV) structure.

Organization: Teachers in Space
Payload Name: Serenity
Class: 3U CubeSat
Deployer: Firefly 3U CubeSat Dispenser
Mission: To collect atmospheric pressure, temperature, and radiation data and make it available for the educational community while also testing the effect of radiation on block chain transactions.

Organization: NASA Ames Research Center
Payload Name: TechEdSat-15 (TES-15)
Class: 3U CubeSat
Deployer: Firefly 3U CubeSat Dispenser
Mission: Deploy an articulated exo-brake to test deorbit targeting through drag modulation. Other experiments include the Beacon And Memory Board Interface (BAMBI), which optimizes internal and external data transfer from the nano-sat.

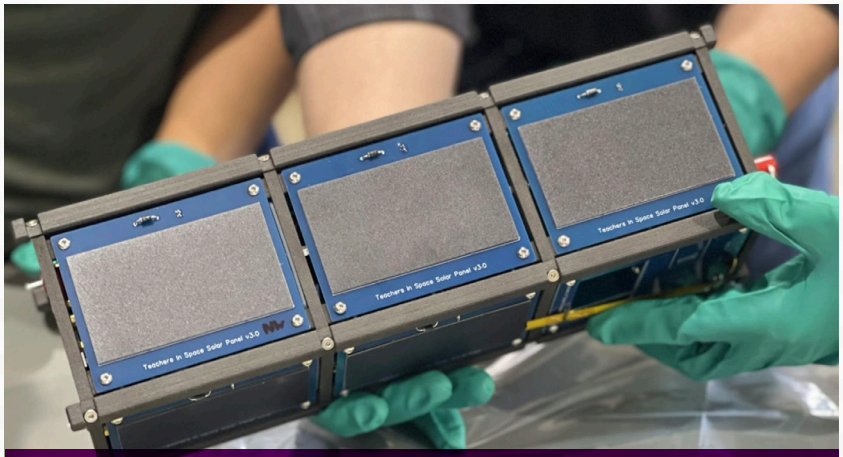
Organization: Libre Space Foundation
Payload Name: PicoBus
Class: Pocketqube Deployer for 5 picosatellites
Mission: Test the worlds first fully free and open-source telecommunications constellation and demonstrate long-range telecommunications ability.

Organization: Teachers In Space, Girls Scouts of Austin, Jonna Ocampo
Payload Name: Firefly Capsule
Class: Capsule of Artwork
Mission: Raise space enthusiasm for children by flying artwork to orbit including:

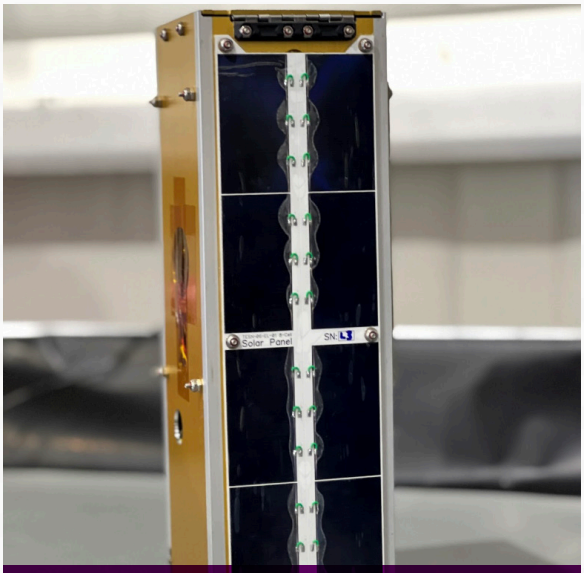
- 128 Postcards from Teacher In Space made by children around the country
- Henry the Astronaut, a book by Jonna Ocampo
- Space Artwork by the Girl Scouts of Austin

PAYLOADS

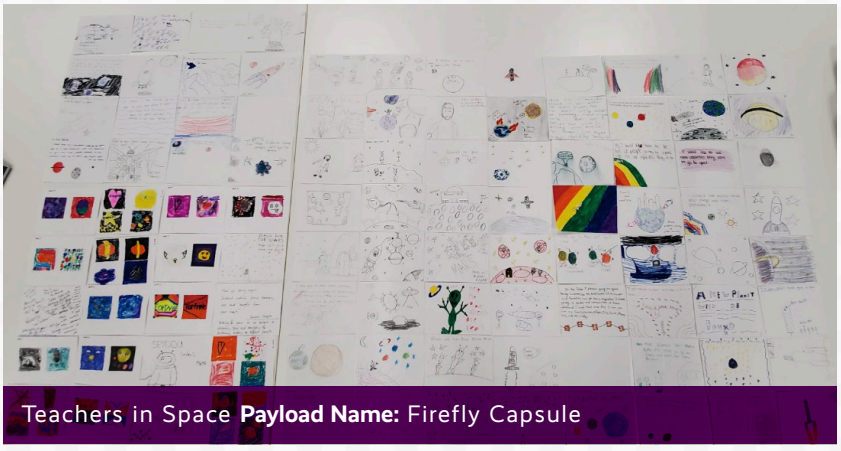
Gallery



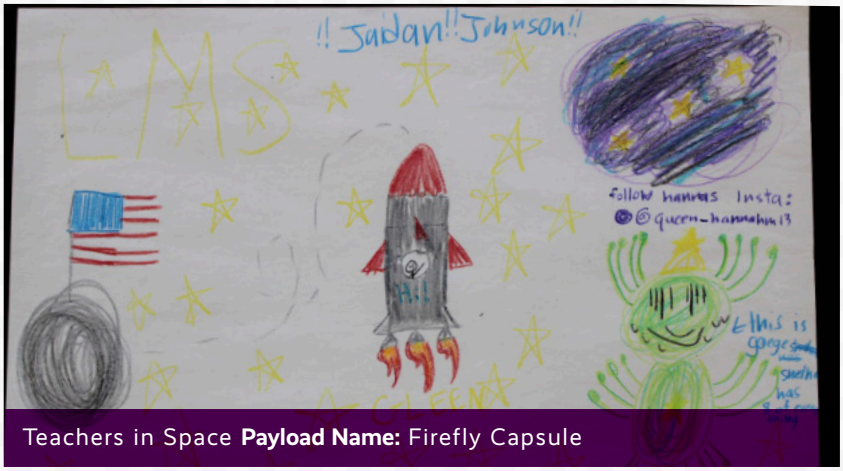
Teachers in Space **Payload Name:** Serenity



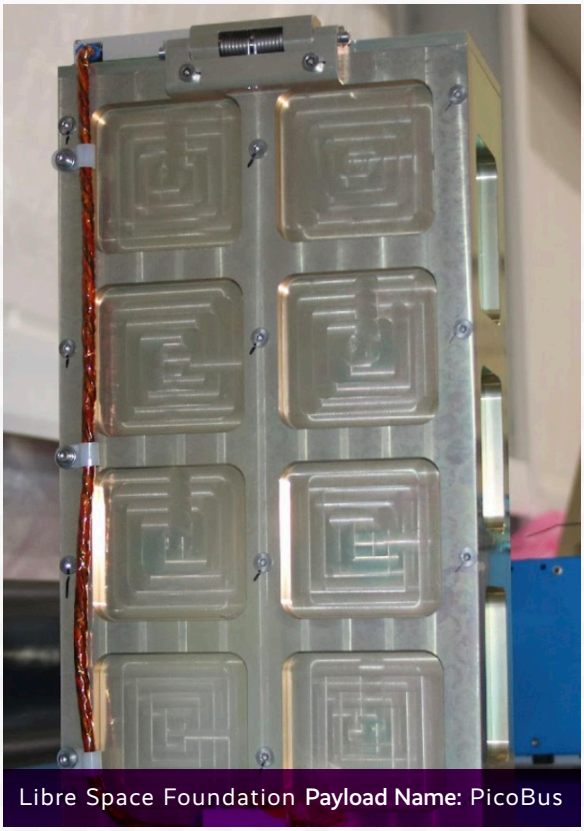
Nasa **Payload Name:** TechEdSat-15 (TES-15)



Teachers in Space **Payload Name:** Firefly Capsule



Teachers in Space **Payload Name:** Firefly Capsule



Libre Space Foundation **Payload Name:** PicoBus

FIREFLY AEROSPACE

ABOUT

Firefly Aerospace

Firefly is developing a family of launch and in-space vehicles and services that provide industry-leading affordability, convenience, and reliability. Firefly's launch vehicles utilize common technologies, manufacturing infrastructure and launch capabilities, providing LEO launch solutions for up to ten metric tons of payload at the lowest cost per kg in the small-launch class. Combined with Firefly's in-space vehicles, such as the Space Utility Vehicle and Blue Ghost Lunar Lander, Firefly provides the space industry with a single source for missions from LEO to the surface of the Moon or beyond. Firefly is headquartered in Cedar Park, TX. For more information please see: **www.fireflyspace.com**

LIVE STREAM LINKS

firefly.com/alpha-flight-2-to-the-black

Webcast will be live approx. T-60 minutes

UPDATES

For more information on current and future missions visit:

firefly.com/missions

FOLLOW FIRELY

@Firefly_Space

facebook.com/fireflyspace

BOOKING LAUNCH@FIREFLY.COM

FIREFLY AEROSPACE

FIREFLY FLTA002 THE BLACK

FLTA002 TO THE BLACK

MEDIA CONTACT

Kim Jennett
Director
Corporate Marketing and Communications
(408) 375-4758
Kim.jennett@firefly.com

www.firefly.com