Filed Pursuant to Rule 424(b)(3)
Registration No. 333-291599

11,111,116 Shares



Common Stock

This prospectus supplement updates and supplements the prospectus dated December 19, 2025, as supplemented or amended from time to time (the "Prospectus"), which forms a part of our Registration Statement on Form S-1 (Registration No. 333-291599). This prospectus supplement is being filed to update and supplement the information in the Prospectus with the information contained in the Company's Current Report on Form 8-K, filed with the SEC on October 6, 2026 (the "Form 8-K"). Accordingly, we have attached the Form 8-K to this prospectus supplement.

The Prospectus relates to the offer and sale from time to time by the selling securityholders named in the Prospectus (the "Selling Securityholders") of up to 11,111,116 shares of Common Stock, par value $0.0001 per share (the "Common Stock") of Firefly Aerospace Inc. ("Firefly Aerospace") that were received by such Selling Securityholders as consideration in connection with Firefly Aerospace's acquisition of SciTec Innovations, LLC, a Delaware limited liability company.

This prospectus supplement should be read in conjunction with the Prospectus. This prospectus supplement updates and supplements the information in the Prospectus. If there is any inconsistency between the information in the Prospectus and this prospectus supplement, you should rely on the information in this prospectus supplement.

Our Common Stock is listed on the Nasdaq Global Market under the symbol "FLY". On October 5, 2026, the closing price of our Common Stock was $22.59 per share.

Investing in our Common Stock involves risks. See "Risk Factors" beginning on page 9 of the Prospectus, and under similar headings in any further amendments or supplements to the Prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if the Prospectus or this prospectus supplement is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is October 6, 2026.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 8-K

CURRENT REPORT

Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): September 30, 2026

Firefly Aerospace Inc.

(Exact name of Registrant as Specified in Its Charter)

Delaware	**001-42789**	**81-5194980**
(State or Other Jurisdiction of Incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**
2203 Scottsdale Drive Leander, Texas		**78641**
(Address of Principal Executive Offices)		**(Zip Code)**

Registrant's Telephone Number, Including Area Code: 512 893-5570

(Former Name or Former Address, if Changed Since Last Report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common stock, par value $0.0001 per share	FLY	The Nasdaq Stock Market LLC

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§ 230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§ 240.12b-2 of this chapter).

Emerging growth company ☒

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Item 5.02 Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

Resignation of Director

On September 30, 2026, Thomas Zurbuchen notified the Board of Directors (the "Board") of Firefly Aerospace Inc. (the "Company") of his decision to resign as a director of the Company, effective September 30, 2026.

Dr. Zurbuchen's resignation was not the result of any disagreement with the Company or its management on any matter relating to the Company's operations, policies or practices. The Board thanks Dr. Zurbuchen for his service and contributions to the Board and wishes him well in his future endeavors.

Appointment of Director

On October 5, 2026, the Board appointed Rick Ambrose to serve as a Class III director of the Company, effective immediately, with a term expiring at the Company's annual meeting of stockholders to be held in 2028 or until his successor is duly elected and qualified.

The Board also appointed Mr. Ambrose to serve as a member of the Audit Committee of the Board and as a member of the Compensation Committee of the Board, in each case effective immediately.

The Board has determined that Mr. Ambrose is "independent" under the applicable listing standards of The Nasdaq Stock Market LLC ("Nasdaq") and the applicable rules of the Securities and Exchange Commission, including, with respect to service on the Audit Committee, the heightened independence requirements of Rule 10A-3 under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the applicable Nasdaq listing standards.

Mr. Ambrose, age 68, currently serves on the board of directors of Textron Inc. (NYSE: TXT). Since December 2022, he has served as a Senior Director at SDR Ventures, and since September 2022, he has served as the President of Ambrose Advisors, LLC. From October 2022 to December 2023, he served as a Senior Advisor at McKinsey & Company. He retired in March 2022 as the Executive Vice President—Space of Lockheed Martin Corporation, a global security and aerospace company, where he led Lockheed Martin's $12 billion Space business. Prior to this role, which he assumed in 2013, he served as President, Lockheed Martin Information Systems & Global Solutions-National from 2011 through 2012 and as Vice President & General Manager, Lockheed Martin Surveillance & Navigation Systems, a line of business within Space, from 2006 through 2010. He joined Lockheed in 2000 as Vice President & General Manager, Lockheed Martin Ground Systems and served as President, Lockheed Martin Maritime Systems & Sensors Tactical Systems from 2004 to 2006. Prior to joining Lockheed Martin, Mr. Ambrose served as President and General Manager of the Space Systems Division at Hughes Information Systems (which merged with Raytheon C3I Systems in 1997). The Board believes Mr. Ambrose is qualified to serve as a director given his leadership experience in the aerospace industry and financial expertise.

Mr. Ambrose will participate in the Company's non-employee director compensation program as set forth in the Company's Outside Director Compensation Policy (the "Policy"). Under the Policy, each non-employee director receives an annual cash retainer of $100,000 for Board service, payable in advance in four equal quarterly installments. Non-employee directors also receive additional annual cash retainers of $50,000 for the Non-Executive Chair of the Board; $20,000 and $10,000 for the chair and members, respectively, of the Audit Committee of the Board; $15,000 and $7,500 for the chair and members, respectively, of the Compensation Committee of the Board; and $15,000 and $5,000 for the chair and members, respectively, of the Nominating and Corporate Governance Committee of the Board. In addition, pursuant to the Policy, as a newly appointed director, Mr. Ambrose will receive a one-time grant of restricted stock units with a value of $150,000 and, as a non-employee director, will receive an annual restricted stock unit grant with a value of $150,000 on the date of each annual meeting of stockholders, with Mr. Ambrose's annual grant at the first annual meeting following his appointment being prorated to reflect the portion of the preceding year he served as a non-employee director. Each such grant vests in full on the first anniversary of the grant date subject to such director's resignation from our Board or otherwise ceasing to serve as a director through the vesting date. Each equity grant under the Policy is subject to full acceleration of vesting immediately prior to a Change in Control (as defined in the Policy) of the Company. The Company also reimburses

non-employee directors for reasonable out-of-pocket expenses incurred in attending Board and committee meetings. The foregoing description of the Policy does not purport to be complete and is qualified in its entirety by reference to the full text of the Policy, which is filed as Exhibit 10.6 to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2026 and is incorporated by reference herein. In connection with his appointment, Mr. Ambrose will also enter into the Company's form of indemnification agreement for directors.

There are no arrangements or understandings between Mr. Ambrose and any other person pursuant to which he was selected to serve as a director of the Company. There are no transactions, and no currently proposed transactions, between the Company and Mr. Ambrose that would require disclosure under Item 404(a) of Regulation S-K. There are no family relationships between Mr. Ambrose and any director or executive officer of the Company.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

FIREFLY AEROSPACE INC.

Date: October 6, 2026

By: /s/ Darren Ma
Darren Ma
Chief Financial Officer