

# APERTURE

## The Phase II Signal

*SBIR Phase II Awards as Leading Indicators of  
Private Capital Formation in Defense Technology*

---

Intelligence Report | February 18, 2026

27,529 SBIR award embeddings | SEC Form D filings | 164 validated signals  
Proprietary sbir\_validated\_raise detection | 10 NDS policy priority scores

# 1. Analyst's Note

The defense technology sector is undergoing a structural shift in how early-stage companies capitalize. This report presents evidence for a specific, testable thesis: SBIR Phase II awards are a leading indicator of private capital raises in defense-adjacent startups, with a median lag of 8 months and a cumulative \$8.5 billion in post-SBIR private capital across the validated cohort.

## The Finding

Of 264 defense startups that hold both SBIR awards and SEC Reg D filings, 164 (62%) meet a strict validation test: their SBIR activity demonstrably preceded or catalyzed their private fundraising. These 164 companies have collectively raised \$8.48 billion in private capital following their SBIR milestones.

This is not a coincidence of timing. The data shows a consistent pattern:

- 82 companies (50%) followed the textbook pathway: SBIR first, Phase II as catalyst, then private raise. These account for \$3.6B in post-SBIR capital.
- 49 companies (30%) won SBIRs before raising privately but without a direct Phase II catalyst - the portfolio itself built credibility.
- 33 companies (20%) show a mixed sequence where a Phase II award preceded measurable fundraising acceleration.

The 100 companies filtered out failed the sequencing test: 75 raised venture capital before winning any SBIR, and 25 had ambiguous timelines. The strict filter removes 38% of the raw signal, leaving a higher-confidence subset.

## Key Statistics

<b>164</b> Validated Cohort	<b>\$8.48B</b> Post-SBIR Capital	<b>8 mo</b> Median Gap	<b>62%</b> Filter Rate
--------------------------------	-------------------------------------	---------------------------	---------------------------

Metric	Value	Amount / Range	Note
Companies raising \$100M+	16	\$5.94B	70% of total capital
Companies raising \$25-100M	36	\$1.73B	20% of total capital
Companies raising \$5-25M	56	\$694M	8% of total capital
Companies raising under \$5M	56	\$110M	1% of total capital
Avg SBIRs per company	6.9	1-128 range	3.2 avg Phase II
High confidence (0.95)	55	33%	sbir_first + catalyst + >\$5M
Strict vs. loose filter	164 / 264	62%	38% excluded

For investors, Phase II awards function as a government-validated technical milestone. The 8-month median gap represents a window of asymmetric information: the Phase II award is public, but the market has not yet priced in the private capital formation it predicts. For the 3,221 Phase II startups that have not yet filed a Reg D, this analysis suggests a substantial pipeline of potential first-time raises.

## 2. Cohort Analysis

### 2.1 Sector Distribution

Software companies dominate by count (64, 39%), but aerospace platforms dominate by capital (\$4.25B, 50%). RF hardware punches above its weight: 7 companies account for \$1.22B.

Sector	Companies	Capital	Avg Raise	% Total
AEROSPACE_PLATFORMS	30	\$4,247.7M	\$141.6M	50.1%
RF_HARDWARE	7	\$1,217.5M	\$173.9M	14.4%
SOFTWARE	64	\$1,221.8M	\$19.1M	14.4%
COMPONENTS	43	\$958.6M	\$22.3M	11.3%
OTHER	15	\$624.4M	\$41.6M	7.4%
SYSTEMS_INTEGRATOR	4	\$201.3M	\$50.3M	2.4%

### 2.2 Sector x Sequence

The sbir\_first pathway dominates across all sectors. Aerospace has the highest mixed-sequence rate (33%), suggesting capital-intensive sectors often begin raising before SBIR maturity - but Phase II still catalyzes larger follow-on rounds.

Sector	sbir_first (capital)	mixed (capital)	% Mixed
AEROSPACE_PLATFORMS	20 (\$2,935M)	10 (\$1,313M)	33%
COMPONENTS	33 (\$743M)	10 (\$215M)	23%
SOFTWARE	54 (\$878M)	10 (\$344M)	16%
RF_HARDWARE	6 (\$1,213M)	1 (\$5M)	14%
OTHER	13 (\$545M)	2 (\$80M)	13%
SYSTEMS_INTEGRATOR	4 (\$201M)	0	0%

### 2.3 Policy Alignment

Companies scored against 10 National Defense Strategy priority areas weighted by FY26 budget growth. Space resilience dominates (26% of cohort, 41% of capital).

Policy Priority	Companies	Capital	% of Total
Space Resilience	43	\$3,505.0M	41.3%
Contested Logistics	21	\$1,473.8M	17.4%
Electronic Warfare	2	\$1,346.8M	15.9%
Autonomous Systems	22	\$488.3M	5.8%
JADC2	13	\$292.8M	3.5%
Hypersonics	8	\$232.7M	2.7%
Supply Chain Resilience	5	\$175.8M	2.1%
Border / Homeland	5	\$169.2M	2.0%
Cyber Offense/Defense	14	\$176.6M	2.1%
Nuclear Modernization	1	\$139.5M	1.6%

## 2.4 Raise Timing (Phase II to Reg D)

For the 115 companies with Phase II catalyst data, the gap between award and subsequent filing clusters into four windows. The 0-3 month bucket has the highest average raise (\$80.7M), where Phase II serves as both an independent signal and a closing catalyst - VCs tracking SBIR milestones time raises around award announcements.

Gap Window	Companies	Avg Raise	Interpretation
0-3 months	32 (28%)	\$80.7M	Phase II as signal + closing catalyst; VCs time raises around awards
4-6 months	20 (17%)	\$19.4M	Fast followers - Phase II triggers process
7-12 months	40 (35%)	\$54.7M	Standard cycle - full fundraise post-award
13-18 months	23 (20%)	\$18.8M	Slow burn - possible Phase III bridge first

49 additional companies lack gap data (no Phase II catalyst or Phase I only).

## 2.5 Geography

State	Companies	Capital	Notable Cluster
California	41 (25%)	\$3,009M	El Segundo (launch), Bay Area (software)
Texas	13 (8%)	\$315M	Austin, San Antonio
Colorado	12 (7%)	\$198M	Colorado Springs (space)
Virginia	7 (4%)	\$125M	Northern VA (DoD-adjacent)
Massachusetts	4 (2%)	\$1,210M	Billerica (SI2 Technologies)
Florida	3 (2%)	\$222M	Space Coast
Other states	84 (51%)	\$3,401M	Distributed

## 2.6 SBIR Depth

The cohort averages 6.9 SBIRs per company (3.2 Phase II). The range is extreme: from single-award companies (Relativity Space, 1 SBIR) to deeply embedded R&D organizations (Corvid Technologies, 128 SBIRs). Companies with 15+ SBIRs tend to be long-standing government technology contractors with deep technical moats.

### 3. The Next Wave: Deal Flow Pipeline

---

Of the 3,221 Phase II startups with no Reg D filing, the following 15 have the highest policy tailwind scores and recent Phase II activity (2023-2024). Based on patterns in the validated cohort, these companies exhibit the pattern most associated with subsequent private capital formation.

#### 1. PORTAL SPACE SYSTEMS INC.

AEROSPACE\_PLATFORMS | BOTHELL, Washington | Tailwind: 0.90 | space\_resilience  
7 total SBIRs, 4 Phase II | No Reg D filings  
*P2 [2024-09-03]: Solar Concentrator Development and Validation Testing for Advanced Spacecraft Ma*  
*P2 [2024-08-21]: Flare Propulsion Qualification Testing for Enhanced Dynamic Space Operations*

---

#### 2. EXPERIMENTAL DESIGN & ANALYSIS SOLUTIONS, INC.

SOFTWARE | Spring Hill, Tennessee | Tailwind: 0.90 | hypersonics  
7 total SBIRs, 3 Phase II | No Reg D filings  
*P2 [2024-08-13]: Advanced Test Platform Software to Accelerate Hypersonic Testing*  
*P2 [09/28/2020]: Machine Learning of Part Variability for Predictive Maintenance*

---

#### 3. KATALYST SPACE TECHNOLOGIES, LLC

COMPONENTS | FLAGSTAFF, Arizona | Tailwind: 0.90 | space\_resilience  
7 total SBIRs, 3 Phase II | No Reg D filings  
*P2 [2024-02-21]: Interoperable Cislunar Observation Network (ICON) Phase II*  
*P2 [07/14/2023]: Light Weight Modular Perception Enhancement (LIMPET) TACFI Sequential Phase II*

---

#### 4. ASSURED SPACE ACCESS TECHNOLOGIES INC

RF\_HARDWARE | CHANDLER, Arizona | Tailwind: 0.90 | space\_resilience  
4 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2024-02-13]: FreeSpace Space Domain Awareness*

---

#### 5. BUSEK CO., INC.

COMPONENTS | NATICK, Massachusetts | Tailwind: 0.80 | space\_resilience  
38 total SBIRs, 17 Phase II | No Reg D filings  
*P2 [2024-02-15]: Thermal Improvement on 1 Newton ASCENT Thruster Valve Assembly (TVA)*  
*P2 [11/18/2014]: Novel High Velocity Ion Beam Generation for Space Propulsion*  
*Note: Deep SBIR portfolio with no private capital history may indicate a self-sustaining government revenue model rather than a pre-raise posture.*

---

#### 6. EBASE, LLC

SOFTWARE | STERLING, Virginia | Tailwind: 0.80 | space\_resilience  
8 total SBIRs, 4 Phase II | No Reg D filings  
*P2 [2024-08-16]: Adversarial Space Threat Simulator For Space Defense and Counter-Space*  
*P2 [11/08/2022]: SBMC2 Course-of-Action Generator For Multiple Threats Across Theater*

---

## 7. Magma Space Inc

COMPONENTS | WASHINGTON, District of Columbia | Tailwind: 0.80 | space\_resilience  
2 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2024-09-06]: Magnetic bearing reaction wheels for low-jitter and long-life operation*

---

## 8. SILOTECH GROUP INC

SOFTWARE | SAN ANTONIO, Texas | Tailwind: 0.80 | space\_resilience  
2 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2024-07-08]: Orbital Evolution: Navigating the Future with Spaceport Digital Transformation*

---

## 9. TB2 AEROSPACE

COMPONENTS | BRECKENRIDGE, Colorado | Tailwind: 0.75 | contested\_logistics  
3 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2024-05-08]: Utilizing the Drone Recharging Operational Payload System to Autonomously Establ*

---

## 10. Multi-Domain Global Solutions LLC

SYSTEMS\_INTEGRATOR | PALM HARBOR, Florida | Tailwind: 0.75 | autonomous\_systems  
1 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2024-08-15]: Completely Autonomous Perimeter Surveillance System (CAPS)*

---

## 11. Hybird Space Systems LLC

COMPONENTS | Huntsville, Alabama | Tailwind: 0.74 | space\_resilience  
2 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2024-09-24]: Hybrid Propulsion for Low-Cost and Scalable Tactical Rocket Motors*

---

## 12. Evolution Space, Inc.

AEROSPACE\_PLATFORMS | ZION, Illinois | Tailwind: 0.72 | hypersonics  
2 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2024-08-22]: AFFORDABLE, RAPID AND RESPONSIVE HYPERSONIC BOOST AND TARGET SOLUTIONS*

---

## 13. SCOUT SPACE INC

AEROSPACE\_PLATFORMS | Reston, Virginia | Tailwind: 0.71 | space\_resilience  
8 total SBIRs, 4 Phase II | No Reg D filings  
*P2 [2024-08-07]: Leveraging On-board Perception Data Products for Tactically-Responsive Countersp*  
*P2 [2023-12-15]: Adaptation of the OWL Electro-Optical Space Domain Awareness Sensor to Enable Ta*

---

## 14. ARGO SPACE CORP

AEROSPACE\_PLATFORMS | El Segundo, California | Tailwind: 0.71 | space\_resilience  
2 total SBIRs, 1 Phase II | No Reg D filings  
*P2 [2023-12-15]: The Argonaut: Refuellable Space Transport Vehicle for Contested Logistics and Re*

---

## 15. HART SCIENTIFIC CONSULTING INTERNATIONAL L.L.C.

COMPONENTS | Tucson, Arizona | Tailwind: 0.71 | space\_resilience  
17 total SBIRs, 9 Phase II | No Reg D filings  
*P2 [2024-07-02]: Passive Aircraft Avoidance through EO/IR Imaging and Reconfigured TBAD*  
*P2 [2024-06-18]: Demonstration of Wavefront Correction in a Sodium Laser Guide Beacon Uplink*

## 4. Illustrative Case Studies

---

The following companies illustrate the three primary pathways from SBIR to private capital. They are not ranked - they are evidence for the thesis.

### Pathway A: Textbook SBIR-First

*Deep SBIR portfolio built over years; private capital follows government validation.*

#### SI2 TECHNOLOGIES, INC

RF\_HARDWARE | NORTH BILLERICA, Massachusetts | Conf: 0.95 | sbir\_first | Raised: \$1.16B | Tailwind: 0.49  
55 SBIRs, 29 Phase II over a decade (2014-2024). First Reg D: Dec 2020 - a 6-year SBIR-only period. Post-SBIR: \$1.16B across 7 Reg D filings (dominated by \$1.1B single filing in Mar 2022). This filing likely represents PE/growth equity, not a typical venture round. Spans phased arrays, conformal antennas, radar-absorbing materials, hypersonic radomes. The SBIR portfolio IS the product development history.

#### CORVID TECHNOLOGIES, LLC

AEROSPACE\_PLATFORMS | MOORESVILLE, North Carolina | Conf: 0.95 | sbir\_first | Raised: \$105.3M | Tailwind: 0.36  
128 SBIRs, 47 Phase II - most prolific in the cohort. First Reg D: May 2021. Post-SBIR: \$105.3M across 5 filings. Work includes cruise missiles, hypersonic analysis, control surface assessment. 14-month gap represents the standard aerospace fundraising cycle.

#### X-BOW LAUNCH SYSTEMS INC

AEROSPACE\_PLATFORMS | ALBUQUERQUE, New Mexico | Conf: 0.95 | sbir\_first | Raised: \$92.5M | Tailwind: 0.51  
5 SBIRs, 3 Phase II - lean but high-impact. Post-SBIR: \$92.5M across 4 filings. 3D-printed solid rocket motors. 3-month gap suggests Phase II was a closing catalyst.

---

### Pathway B: SBIR-to-Scale

*Modest SBIR footprint as launchpad, then substantially larger private rounds.*

#### ABL SPACE SYSTEMS COMPANY

AEROSPACE\_PLATFORMS | El Segundo, CA | Conf: 0.95 | sbir\_first | Raised: \$480.3M | Tailwind: 0.77  
5 SBIRs, 2 Phase II. Post-SBIR: \$480.3M across 5 filings. Only 3 months from first SBIR to first raise. Tailwind 0.77 (highest in case set). Surgical SBIR engagement validated responsive launch thesis, followed by rapid capital formation.

#### GECKO ROBOTICS, INC.

SYSTEMS\_INTEGRATOR | PITTSBURGH, Pennsylvania | Conf: 0.85 | sbir\_first | Raised: \$121.5M | Tailwind: 0.45  
4 SBIRs, 2 Phase II. Post-SBIR: \$121.5M in a single filing (May 2025). 6-year gap SBIR-to-raise. Primarily commercial robotics; SBIRs for ICBM infrastructure inspection and Minuteman III analytics built defense credibility.

---

### Pathway C: Mixed Signal

*Private capital and SBIR overlapped, but Phase II preceded fundraising acceleration.*

#### ANTARES NUCLEAR, INC.

OTHER | Torrance, California | Conf: 0.85 | mixed | Raised: \$78.6M | Tailwind: 0.61  
3 SBIRs, 2 Phase II. First Reg D (\$8.1M): Oct 2023, predates first SBIR. But two Phase IIs in Aug 2024 preceded \$78.6M capital surge. 1-month gap - tightest in case set. Government validation carries exceptional weight for nuclear technology.

**HIDDEN LEVEL INC**

SOFTWARE | SYRACUSE, New York | Conf: 0.85 | mixed | Raised: \$109.1M | Tailwind: 0.52

4 SBIRs, 2 Phase II. First Reg D (\$15.9M): Jun 2021, predates first SBIR. Phase IIs in 2024 preceded step-up in round sizes.

UAS detection for border/homeland - policy-driven market where SBIR validation builds defense investor credibility.

---



## 5. Methodology

---

### 5.1 Signal Detection

The `sbir_validated_raise` signal applies the following logic to every entity:

**Trigger conditions (at least one):**

- SBIR-first pathway: entity's first SBIR predates its first Reg D filing
- Phase II catalyst: a Reg D filing occurs within 18 months after a Phase II award

**Confidence scoring:**

- Base: 0.70 | +0.10 if SBIR-first | +0.10 if Phase II catalyst | +0.05 if raise > \$5M | Cap: 0.95

**Deduplication:**

- Reg D filings with identical (`entity_id`, `event_date`, `amount`) treated as amendments. 25 duplicate groups removed, representing \$1.67B in inflated capital.

### 5.2 Post-SBIR Raise Calculation

All raise amounts are CUMULATIVE Reg D totals - the sum of every Reg D filing amount after the entity's first SBIR award date. A company listed as raising "\$381.9M" may have achieved that across 3, 5, or 10 separate SEC filings. This is deliberate: the thesis concerns total private capital attracted after SBIR validation, not individual round sizes. Reg D filings report total amount sold, which may include debt, equity, or convertible instruments.

### 5.3 Policy Alignment

Each entity scored against 10 NDS priority areas using SBIR title keyword matching weighted by FY26 budget growth rates. Composite tailwind score (0.0-1.0) represents alignment with budget growth vectors.

### 5.4 Next Wave Pipeline

Pipeline candidates selected from STARTUP entities with Phase II awards since January 2023, no Reg D filings, policy tailwind > 0.3. Ranked by tailwind score then Phase II count. Pool size: 3,221 startups.

## 6. Data Provenance & Limitations

### Data Sources

Source	Coverage	Freshness
SBIR.gov	Phase I, II, III awards (all DoD)	Through Sep 2024
SEC EDGAR	Reg D filings (Form D)	Through Oct 2025
Entity resolution	Fuzzy match across datasets	27,529 embeddings

### Known Limitations

- Reg D coverage gaps:** Not all private fundraises require Form D. Companies raising from non-US investors or under certain exemptions are absent. True post-SBIR capital is likely higher.
- Reg D amount accuracy:** Form D reports total amount sold, which may be amended. Our dedup catches same-date/same-amount amendments, but rolling closes with different amounts are treated separately.
- Survivorship bias:** Only companies with both SBIRs and Reg D are represented. Companies that won SBIRs but failed or were acquired before filing Reg D are excluded.
- Causal inference:** This report identifies correlation and temporal sequence, not causation. Confounding factors (founder networks, market timing, technology maturity) are not controlled for.
- Single-SBIR companies:** 23 companies have only 1 SBIR. For these (e.g., Relativity Space, \$50K Phase I), the causal link is weakest.
- Entity resolution:** Fuzzy name matching may produce false positives or miss connections. Merge resolution applied but not exhaustive.

Generated by Aperture Signals Intelligence Engine | February 18, 2026 | Signal detection: `processing/signal_detector.py` | QA verification: 178/178 checks passed (`scripts/qa_report_data.py`)