

Commentary

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[By the Numbers \(contracts and data\) ... page 5](#)

Inside the Commentary...some thoughts on:

- Unravelling of globalization
- New cold wars
- What happens after Putin?
- The US defense budget is released: winners and losers
- What we've learned about Russian capabilities
- What is Russia's endgame? What does this mean going forward?
- Secret China: Monitoring the Ukraine from the sidelines, what is their plan?
- New Wall of Worry: The French Election

In 2021, it was difficult to write a commentary on investing in the defense sector. To be honest, not much was happening that would influence the sector; it was the tortoise, not the hare. The news was quiet as were the stocks. It gained but not nearly as much as the overall stock market.

In our January newsletter, we stated that "History Suggests Defense Stocks Will Surge in 2022." We cited a number of reasons why we believed it would be a great year for investors in defense stocks, citing both trends and historical charts. And while we included a Russian invasion of Ukraine on our wall of worry for the year, we of course didn't have the foresight to realize it would happen so soon after our prediction.

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Recent Commentaries

<https://www.defensenews.com/opinion/commentary/2022/03/21/how-sanctions-on-russia-impact-western-defense-companies/>

<https://www.investorideas.com/news/2022/defense/01121Stocks.asp>

SPADE Defense Index Statistics

3/31/22 Close	9155.12
12/31/21 Close	8456.65
All-time Intraday High: 25 March 2022	9357.25
All-time Closing High: 25 March 2022	9314.78

	SPADE Defense	S&P500
2022	8.25%	[4.95%]
1Q22	8.25%	[4.95%]

**SPADE Defense Index
March 2022 Rebalance**

Three companies were added to the index during the March 2022 rebalance:

1. BigBear.ai (BBAI): Provides data analytics, cybersecurity, and systems engineering to NSA, DoD, and DHS.
2. TTM Technologies (TTMI): Provides defense electronics.
3. VSE Corp (VSEC): Logistics, engineering services, and fleet management to multiple DoD and government agencies.

Corporate Actions Affecting the Index During the Quarter

- PAE (NYSE: PAE) was acquired by Amentum for \$1.9B including the assumption of debt and fees on 15 February 2022.
- The acquisition of Aerojet Rocketdyne by Lockheed Martin was terminated (13 February 2022); the Federal Trade Commission sued to block the \$4.4 billion deal on 25 January 2022.

Dividend

Invesco's Aerospace & Defense ETF issued a dividend of \$0.094 on 21 March 2022.

Licensed Products

Exchange Traded Fund (ETF)

The SPADE Defense Index has been licensed to Invesco and serves as the underlying index for the Invesco Aerospace & Defense ETF (NYSE Arca: PPA).

Options Trading

Options on the Invesco Aerospace and Defense ETF (ticker: PPA) began trading in November 2019.

Inside the FY2023 Budget: Observations

- \$773 B - DoD budget sent by Biden Administration to Congress for FY23. Total national security budget is \$813B including \$40B to maintain nuclear weapons by Dept of Energy.
 - Up 8% from last year. Congress had also added tens of billions to the original request before approving \$743B.
 - Real growth of 1.5% after inflation.
- | | |
|-------------------|----------|
| Army | \$177.3B |
| Navy/Marine Corps | \$230.9B |
| AF/Space Force | \$234.1B |
| Defense wide | \$130.7B |
-
- \$276B of the \$773B total proposed to DoD will go toward procurement and R&D efforts.
 - \$130B for R&D is the largest ever. Includes \$4.7B to boost research into hypersonic weapons, \$3.3B for 5G wireless, and \$1.3B in biotechnology.
 - Will retire 150 USAF planes and 12+ Navy ships to free up money to buy new weapons. The USAF plans to shrink its Lockheed C-130 tactical cargo plane fleet from 279 to 271. *Politico* reported that the Navy intends to retire 10 Freedom-class Littoral Combat Ships.
 - The USAF is cutting its planned buy of HH-60W Jolly Green II search-and-rescue helicopters meant to replace older Pave Hawk from 113 to 75, the last of which to be purchased in 2023. Also plans to send 100 of its 300+ MQ-9 Reaper drones to “another govt organization--likely DHS or NASA or CIA”
 - \$6.9B to enhance the capabilities and readiness of US forces, NATO allies, and regional partners in the face of Russian aggression.
 - Cyberdefense spending will rise \$800M (8%) to \$11.2 B.
 - Space Force requested \$24.5B, up 40% from last year’s request, citing urgency to launch and defense satellites that can spot a hypersonic missile or a moving truck, and can assure US nuclear command and control.

- \$566M for Space Force to fund the evolved strategic satcom program to ensure survivable communications for the presidential fleet & DoD nuclear command and control aircraft.
- \$2B (\$1B each) for the Next Generation Overhead Persistent IR Geosynchronous Earth Orbit satellites that replace SBIRS and a new constellation of hundreds of LEO, optically-connected satellites tasked with missile tracking and early missile warning.
- *DefenseOne* reported that the USAF might not hold a competition for its next class of aerial refueling tankers and might go with a modified Boeing KC-46 (problems developing have cost Boeing \$5B+). The USAF is currently buying 179 of the converted 767 aircraft for roughly \$35 billion. The USAF hopes to acquire 160 additional tankers. Lockheed and Airbus were expected to pitch a modified A330 but, if true, eliminating the competition would help Boeing recoup cost overruns.
- Boeing will benefit from Biden’s proposal for the USAF to buy 24 F-15EX fighters in 2023 and in each of the next few years for \$1.4B.
- The USAF plans to purchase stealthy, long-range cruise missiles and spend \$900M on missile defense for Guam.
- The USAF wants to retire 33 F-22 Raptors. Lockheed would lose revenue from maintenance/upgrade contracts.
- Boeing’s E-7 Wedgetail is the “leading candidate” to replace the E-3 Sentry, otherwise known as the AWACS.
- The Army wants to buy 35 Boeing-made Apache attack helicopters, five more than originally planned.
- The Navy wants to buy zero F/A-18 Super Hornets. It requested zero last year, but Congress added 12 jets.
- The Navy requested zero V-22 Ospreys.
- The USAF plans to increase production of the stealthy JASSM cruise missiles produced by Lockheed Martin.
- The Air Force will buy 61 F-35s, 33 fewer than planned last year, according to Bloomberg
- *Politico* announced that the Air Force plans to launch two new drone programs.

Commentary (continued from page 1)

The investor reaction, of course, is that defense stocks and ETFs have seen a significant surge in interest from investors. While the overall market YTD is down more than 7%, the SPADE Defense Index is up 7%. Likewise, trading volume in ETFs has soared and the size of Invesco's Defense ETF (NYSE: PPA) has more than doubled (up 130%+). The three largest ETFs in the space have seen their assets grow by \$2.5 billion in the 6 weeks since the invasion.

From an investment standpoint, it is difficult to focus on economic issues after reading day-after-day about Russian atrocities in Ukraine--the bombing of civilian targets, raping and murdering women and children, and sending trainloads of Ukrainian citizens to work in Russia in essentially forced labor camps. Putin is rapidly becoming this century's Hitler, a globally despised despot. The once ago proud nation of Russia is becoming a historical embarrassment. The likelihood of this devolving into WWII is rising, and only an uprising by the Russian people and the elimination of the Russian leadership from power seems to be able to stop this. Is a global conflict or the use of nuclear weapons Putin's endgame? No one knows how far his regime will go.

Strategically...the war in Ukraine has taught us a lot of things. We, like many analysts, had no idea that the Russian military was highly dysfunctional, poorly trained, and lacked the logistics expertise and functional smart weapons that we have been accustomed

Russian Military Losses Since It Invaded Ukraine

Estimate as of April 12th: nearly \$18 billion.

- 732 Tanks (Nearly 6% of its fleet)
- 1,946 Armored Combat Vehicles
- 349 Artillery Systems
- 111 Multiple-Launch Rocket Systems
- 157 Warplanes
- 140 Helicopters
- 7 Ships
- 124 Drones
- 19,6000 personnel

source: Ukrainian Military of Defense

to with the US military. As WWII's Gen. Omar Bradley said, "amateurs talk strategy, professionals talk logistics." The Pentagon is likely reviewing its own operations and reevaluating their estimates of Russian strengths and weaknesses.

Politically...we are either seeing an unraveling of the past decade's trend toward increasing globalization or a future where the world unites following the defeat of a common enemy. Even in a post-Putin environment, the latter scenario is likely fantasy as China and autocratic nations such as North Korea and Iran will likely remain a threat to global stability. And a Russia freed from the tyranny of Putin, but still reeling from the impact of global sanctions, will likely find home to nationalistic elements talking about "the good old days" and willing to engage in conflicts. Looking at history, it took just 20 years for a Germany in a similar situation after WWI to rise up and create new troubles in Europe and the world. Today, there are a number of democratic nations with autocratic leaders that can rally their followers. When people pursue power over others instead of the openness that led to globalization, turmoil and conflict is sure to follow.

Economically...from an investment perspective, the defense sector has historically been a great place to invest when there is fear about the unknown stability of nations. Following the 9/11 terrorist incident, the defense sector rose for nearly a decade, and in many years outperformed the market by more than 10% annually. In both the decades 2000-2009 and 2010-2019, the SPADE Defense Index outperformed the S&P500 by more than 200%. Since the Russian invasion of Ukraine, Invesco's Defense ETF (NYSE: PPA) has more than doubled in size to more than \$1.4 billion and provided returns more than 14% better than the market which is currently down for the year. In fact, since 1997, investors have not lost money by investing in a Fund that tracks this index when holding for 30 months and reinvesting dividends. Every decline has been met by a swift rebound.

Regardless of whether there is a quick solution to the war in Ukraine or there is an escalation, a mili-

tary buildup in Europe is given. Nations there, including Germany, Finland, Latvia and others, have already begun to increase their budgets and place orders for additional equipment. President Biden recently released his proposed budget for FY23 and it calls for more than \$30 billion in additional defense sector spending to a record \$813 billion as well as allocated several billion dollars to aid Ukraine and our allies in NATO countries. In addition to Russia, an emerging cold war with China, and other situations (both externally and internally) that threaten democracy and our "American way of life" will provide fuel for those wanting a strong defense budget.

US National Military Strategy

DoD listed China as the nation's "Most consequential strategic competitor and the pacing challenge" going forward while acknowledging that Russia "poses acute threats. Iran, North Korea and extremist groups, meanwhile remain "persistent threats."

– DoD National Military Strategy, a Joint Chief of Staff document, as reported by *Defense One*.

Our Wall of Worry revisited... If Russia succeeds in Ukraine, who's next? Moldova? Poland? Kazakhstan? With the possibility of Finland and Sweden becoming part of NATO, tensions in Scandinavia will increase. Meanwhile, the invasion by Russia into Ukraine has raised attention to the threat of China pursuing a similar action with Taiwan. China has essentially remained on the sidelines. While it has made some statements regarding certain war crimes, it has not participated in the sanctions imposed by many nations against Russia nor acted directly. Comments from some US defense analysts and retired military officials indicate they believe that China will take action on Taiwan sometime before the end of the decade; depending of course, how Russia emerges from its conflict.

The war has also raised the question of what happens if Marine Le Pen succeeds in capturing France's presidential election that is to take place on 24 April against Francois Macron?

France is currently a key pillar of NATO and the European Union. A vocal admirer of Vladimir Putin, Ms. Le Pen has a long-standing hostility to NATO and has called for her nation to withdraw from its command structure. Her win would likely disrupt European and global politics as well as the embargo (SWIFT payments, trade, and other economic activity) against Russia.

* * *

In conclusion...Inevitably, something always appears to raise our worry level and question our safety. And the ugly truth is, while no one should endorse military conflict and actions like that currently happening in Ukraine, the defense sector provides a measure of insurance and growth to investor portfolios over time.

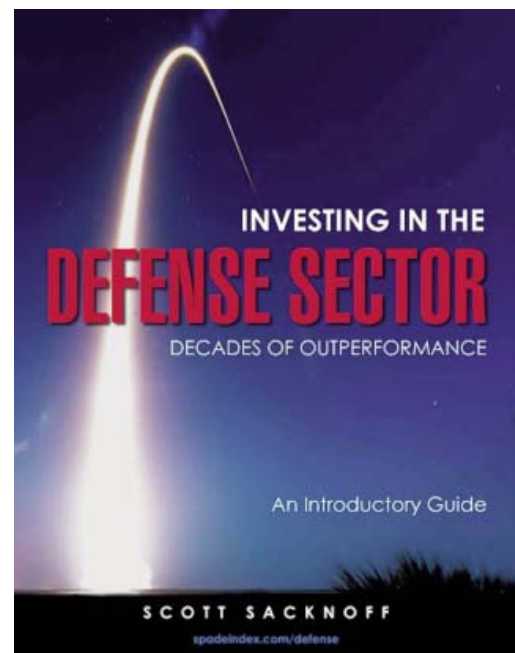
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The SPADE Investor

including our commentaries and industry data can be found at—

[www.spadeindex.com / defense](http://www.spadeindex.com/defense)

Download a free copy of our 56-page guide,
Investing in the Defense Sector

https://spadeindex.com/Files/Investing_Defense_Sector_Guide.pdf



1Q22 Leaders

1	Alleghany Tech.	68.49%
2	Aerovironment	51.77%
3	RADA	47.88%
4	BigBear.ai	45.58%
5	Triumph Group	36.43%
6	Maxar	33.73%
7	Mandiant	27.19%
8	Elbit Systems	26.60%
9	Lockheed Martin	24.19%
10	AAR Corp.	24.08%

1Q22 Laggards

1	Telos	[35.34%]
2	Comtech	[33.77%]
3	Palantir	[24.60%]
4	VSE Corp.	[24.23%]
5	Keysight Tech.	[23.50%]
6	Vectrus	[21.65%]
7	Aerojet Rocketdyne	[15.85%]
8	AXON	[12.27%]
9	Oshkosh	[10.70%]
10	OSI Systems	[8.67%]

Morningstar Says:

PPA is a Four-Star Fund ****
Below Avg Risk in the Industrials Category,

2022 YTD Results

1	Alleghany Tech.	68.49%
2	Aerovironment	51.77%
3	RADA	47.88%
4	BigBear.ai	45.58%
5	Triumph Group	36.43%
6	Maxar	33.73%
7	Mandiant	27.19%
8	Elbit Systems	26.60%
9	Lockheed Martin	24.19%
10	AAR Corp.	24.08%
11	Leidos	21.51%
12	ManTech	18.18%
13	Mercury Systems	17.05%
14	L3 Harris	16.52%
15	General Dynamics	15.69%
16	Northrop Grumman	15.54%
17	Raytheon	15.12%
18	Parsons	15.01%
19	KBR	14.93%
20	Hexcel	14.81%
21	Woodward	14.11%
22	Spirit Aerosystems	13.46%
23	Howmet	12.91%
24	BWX Technologies	12.49%
25	Ducommun	12.02%
26	CACI	11.91%
27	SAIC	10.26%

28	ViaSat	9.56%
29	Moog	8.44%
30	Curtiss Wright	8.29%
31	Teledyne	8.18%
32	Huntington Ingalls	6.80%
33	Heico	6.46%
34	Kratos Defense	5.57%
35	Booz Allen	3.60%
36	CAE	3.33%
37	TransDigm Group	2.40%
38	Kaman	0.76%
39	TTM Technologies	[0.54%]
40	Jacobs	[1.02%]
41	Iridium	[2.35%]
42	Textron	[3.65%]
43	Boeing	[4.88%]
44	Ball	[6.51%]
45	Honeywell	[6.68%]
46	OSI Systems	[8.67%]
47	Oshkosh	[10.70%]
48	AXON	[12.27%]
49	Vectrus	[21.65%]
50	Keysight Tech.	[23.50%]
51	VSE Corp	[24.23%]
52	Palantir	[24.60%]
53	Comtech	[33.77%]
54	Telos	[35.34%]

ETF Statistics (NYSE Arca: PPA)
Invesco Aerospace & Defense

Exchange / Ticker Symbol:	NYSE / PPA
Assets (3/31/22)	\$1397.8M
Closing Price (3/31/22)	\$78.32
Dividend Yield*	1.08%
1Q22 Volume**	13,281,900
Turnover*	22%
Morningstar Rating	**** (4 Star)

source: * Morningstar & ** Yahoo Finance 3/31/22

Capture Ratio*	3-Yr	5-Yr	10-Yr
Upside	85	105	106
Downside	85	97	70

Portfolio Price / Earnings*	21.98
Portfolio Price / Book*	3.09
Portfolio Price / Sales*	1.84
Portfolio Price / Cash Flow*	15.79
Beta (3-year) *	1.05
Alpha (3-years)*	[1.57]
R-squared (3 years)*	62.14
Sharpe Ratio	0.56
Long-Term Earnings*	9.78%
Historical Earnings*	10.29%
Sales Growth*	[1.71%]
Cash Flow Growth*	2.06%
Book Value Growth*	8.26%
Historical Sustainability Score (% Rank)	82

source: * Morningstar 3/31/22

By the Numbers

\$773 B – FY23 budget for DoD, a \$30 B increase over what was passed for 2022.

\$234.1 B – Amount in FY23 budget for US Air Force as it seeks “transformational” change in its fleet structure to keep pace with China and Russia.

\$112 B – Germany has increased its annual defense spending.

\$64 B – Qatar signed an order for 25 - 737-10 Max jets along with options to buy 25 more of the planes for \$30 B + 34 777X freighters valued at \$30+ billion.

\$27.7 B – Boeing received an order from Air Lease Corporation for 50 - 737 Max aircraft. Air Lease is planing to acquire 431 Boeing and Airbus planes through 2028 with a value totaling nearly \$28 billion.

\$24.5 B – Amount in FY23 budget for US Space Force.

\$15 B – Canada has joined the global F-35 alliance to replace its CF-18 fighter aircraft. It plans to acquire 88 F-35s.

\$13.9 B – Indonesia received State Dept approval to acquire up to three dozen Boeing F-15EX fight aircraft.

\$12 B – Delta is considered buying up to 100 Boeing 737 Max 10 aircraft, with a list price of \$120M each.

\$11.5 B – Leidos received from DoD a 10-year contract to support digital modernization and optimization as part of DISA’s Fourth Estate Network Optimization initiative.

\$9.4 B – Finland joined the F-35 alliance and will acquire 64 of the Block 4 configuration jets to be delivered before the end of 2030.

\$6.3B – The USAF will invest in upgrading aging F-16s in the coming years. Some 608 aircraft are slated to receive 22 modifications.

\$6 B – The State Dep’t approved Poland’s acquisition of 250 M1A2 Abrams SEPV3 tanks from General Dynamics Land Systems.

\$4.6 B – The US Air Force’s unfunded priorities list includes 7 F-35 fighter aircraft, 4 EC-37B Compass Call electronic warfare aircraft, and additional funding for system sustainment.

\$4.21 B – Jordan received approval from DSCA to acquire 16 F-16 fighter aircraft in a foreign military sale transaction.

\$2.2 B – The State Dept approved the sale of 12 Lockheed Martin C-130J Super Hercules aircraft to Egypt including defense radar systems.

\$1.67 B – Bulgaria received approval for 8 Lockheed Martin F-16 fighter jets, missiles, and bombs.

\$1.5 B – Amount DoD requested for microelectronics and 5G.

\$1.4 B – Northrop from the US Army for the Future Battle

Command System.

\$1.2 B – Amount in FY23 budget for US Space Force.

\$1.0 B – Dollar amount for weapons sent to Ukraine as of mid-March. Includes 100 drones, 800 Stinger anti-aircraft systems, 2,000 Javelin systems, and 6,000 AT-4 anti-armor systems. The Joint Chiefs of Staff confirmed that the US and allies have so far supplied 25,000 anti-aircraft weapons systems and 60,000 anti-tank systems to Ukraine.

\$1.0 B – Amount Lockheed Martin will invest in manufacturing in Saudi Arabia. The nation has a \$45 billion military budget.

\$950 M – Spain received approval to purchase 8 Lockheed Martin MH-60R Seahawk helicopters and associated equipment.

\$874 M – Amount DoD requested in direct support for AI-related programs.

\$700 M – US State Dept approved a request by the UK to buy Lockheed Martin

\$651 M – US Navy to Raytheon for AN/SPY-6 radar systems. The deal has a top value of \$3.2B if all options are exercised.

\$498.3 M – Boeing to receive from the US Naval Air Systems Command for the delivery of a Harpoon Coastal Defense System Launch System for Taiwan.

\$445 M – Approved by Thailand’s cabinet to acquire F-35 aircraft.

\$374 M – Additional amount the US Army is devoting to counter-drone systems.

\$242 M – Textron acquired electric aircraft manufacturer Pipistrel to supports its new e-Aviation unit.

\$165 M – Mercury Systems from the USAF for flight data recorders for the F-16 fleet.

4,316 – Boeing’s announced backlog in early February--including 3,405 737 Max aircraft.

116 – Aerojet Rocketdyne received an order for 116 RL10 engines,

PPA Dividend History

1Q22	\$0.094	2013	\$0.383
2021	\$0.426	2012	\$0.444
2020	\$0.598	2011	\$0.199
2019	\$0.651	2010	\$0.155
2018	\$0.444	2009	\$0.202
2017	\$0.363	2008	\$0.145
2016	\$0.708	2007	\$0.055
2015	\$0.501	2006	\$0.051
2014	\$0.215	2005	\$0.022

Total Price Return (Annual %)

	SPADE Defense Index
1-Yr	8.25%
3-Yr	11.58%
5-Yr	13.47%
10-Yr	15.92%
15-Yr	10.97%
Inception	11.75%

Through 3/31/2022
(Morningstar)

Index Performance (ex div)

	SPADE Defense Index	S&P500	Alpha (bps)
2022	8.25%	[4.95%]	1320
2021	6.61%	26.89%	[2028]
2020	[0.73%]	16.26%	[1699]
2019	38.49%	28.88%	961
2018	[8.15%]	[6.24%]	191
2017	28.92%	19.43%	949
2016	17.95%	9.53%	842
2015	3.23%	[0.73%]	396
2014	11.77%	11.39%	38
2013	48.27%	29.60%	1867
2012	16.30%	13.41%	289
2011	[2.75%]	[0.00%]	[275]
2010	9.62%	12.78%	[316]

	SPADE Defense Index	S&P500	Alpha (bps)
2009	21.71%	23.45%	[174]
2008	[38.03%]	[38.49%]	46
2007	22.17%	3.53%	1864
2006	19.33%	13.62%	571
2005	5.30%	3.00%	230
2004	20.47%	8.99%	1148
2003	37.27%	26.38%	1089
2002	[2.87%]	[23.37%]	2050
2001	0.94%	[13.04%]	1488
2000	4.98%	[10.14%]	1512
1999	15.31%	19.53%	[422]
1998	6.63%	26.67%	[2004]

Price Return by Decade (ex div)

	SPADE Defense	S&P500	Alpha (bps)
2010-2019	310.26%	189.73%	12,053 (120.53%)
2000-2009	97.07%	-24.11%	12,118 (121.18%)

About the SPADE Defense Index

The SPADE Defense Index (NYSE: DXS) provides an investment benchmark for the value that the market ascribes to companies involved with defense and its homeland security, and space components.

The Index is designed to reflect the broad diversity of activities that is representative of companies involved with the sector—naval vessels, military aircraft, armored vehicles, helicopters, drones and remotely piloted vehicles, missiles and missile defense, command and control, secure communications, battlespace awareness, intelligence and reconnaissance, and space systems, as well as national/homeland security activities including border security, biometric screening systems, and military cybersecurity efforts.

SPADE Indexes specializes in designing and managing equity benchmarks for ETF and other products.

Rules

The SPADE Defense Index was designed to be RIC (registered investment company) compliant for the purpose of enabling financial products. Companies are required to meet an eligibility criteria that includes market valuation (>\$250M), listing on a major U.S. exchange, and have sufficient liquidity. Importantly, each firm must be considered systematically important to the defense of the United States and that their defense business is systematically important to the revenues and health of the firm. We follow an enhanced modified market cap methodology that employs the True Cap™ strategy, which enables the index to more accurately handle firms with diversified operations.

Full details are available at: www.spadeindex.com/defense

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End of 1Q22		100.00%						Market	Forward	Price/	Price/	PEG	
		Percent	31-Dec-21	31-Mar-22	YTD	QTD	Cap	P/E	Sales	Book	5 yr	Div Yld	
Company	Ticker	31-Mar-22	Price	Price	% Ch	% Ch	intraday	(ttm)	ttm	mrq	expected	forward %	
ATI	ATI	0.41%	15.93	26.84	68.49%	68.49%	3.35	17.89	1.20	4.98	6.28	---	
AeroVironment	AVAV	0.67%	62.03	94.14	51.77%	51.77%	2.35	54.42	5.22	3.87	3.86	---	
RADA Electronics	RADA	0.20%	9.42	13.93	47.88%	47.88%	0.69	19.35	5.89	4.41	---	---	
BigBear.ai	BBAI	0.21%	5.66	8.24	45.58%	45.58%	1.12	---	7.67	7.58	---	---	
Triumph Group	TGI	0.46%	18.53	25.28	36.43%	36.43%	1.63	22.98	1.06	2.01	1.76	---	
Maxar Technologies	MAXR	0.82%	29.53	39.49	33.73%	33.73%	2.87	17.70	1.62	1.96	3.91	0.10%	
Mandiant	MNDT	0.52%	17.54	22.31	27.19%	27.19%	5.22	557.75	10.79	3.34	0.66	---	
Elbit Systems	ESLT	2.67%	174.13	220.45	26.60%	26.60%	9.80	25.34	1.86	3.85	1.75	0.85%	
Lockheed Martin	LMT	6.77%	355.41	441.40	24.19%	24.19%	120.21	15.71	1.79	10.92	2.02	2.51%	
AAR Corp	AIR	0.49%	39.03	48.43	24.08%	24.08%	1.71	14.77	0.63	1.66	1.47	---	
Leidos	LDOS	2.82%	88.90	108.02	21.51%	21.51%	14.73	15.09	1.07	3.52	2.31	1.33%	
Mantech International'a'	MANT	0.67%	72.93	86.19	18.18%	18.18%	3.52	22.92	1.38	2.10	4.57	2.51%	
Mercury Computer Sys	MRCY	1.04%	55.06	64.45	17.05%	17.05%	3.66	23.52	3.84	2.41	2.95	---	
L3 Harris	LHX	5.41%	213.24	248.47	16.52%	16.52%	47.97	18.78	2.69	2.50	0.49	1.78%	
General Dynamics	GD	6.88%	208.47	241.18	15.69%	15.69%	67.08	17.21	1.74	3.79	1.82	2.09%	
Northrop Grumman	NOC	6.84%	387.07	447.22	15.54%	15.54%	69.81	16.53	1.96	5.41	3.75	1.41%	
Raytheon Technologies	RTX	6.69%	86.06	99.07	15.12%	15.12%	147.85	17.08	2.30	2.01	1.28	2.02%	
Parsons	PSN	0.58%	33.65	38.70	15.01%	15.01%	3.96	17.83	1.08	2.11	---	---	
KBR	KBR	1.82%	47.62	54.73	14.93%	14.93%	7.64	17.77	1.04	4.54	1.24	0.89%	
Hexcel	HXL	1.18%	51.80	59.47	14.81%	14.81%	5.00	29.88	3.77	3.36	0.45	0.67%	
Woodward	WWD	1.42%	109.46	124.91	14.11%	14.11%	7.88	26.13	3.50	3.53	1.85	0.59%	
Spirit Aerosystems	SPR	1.46%	43.09	48.89	13.46%	13.46%	5.13	20.98	1.30	11.46	1.06	0.08%	
Howmet	HWM	2.62%	31.83	35.94	12.91%	12.91%	15.06	19.53	3.03	4.39	0.80	0.22%	
BWX Technologies	BWXT	1.12%	47.88	53.86	12.49%	12.49%	4.93	16.57	2.32	7.73	4.41	1.60%	
Ducommun	DCO	0.17%	46.77	52.39	12.02%	12.02%	0.63	13.16	0.97	1.32	1.04	---	
CACI Intl	CACI	1.49%	269.21	301.26	11.91%	11.91%	7.05	15.06	1.16	2.48	6.87	---	
SAIC	SAIC	1.18%	83.59	92.17	10.26%	10.26%	5.17	12.05	0.70	3.19	2.48	1.61%	
Viasat Inc	VSAT	0.71%	44.54	48.80	9.56%	9.56%	3.63	169.82	1.35	1.38	11.67	---	
Moog Inc.	MOGA	0.50%	80.97	87.80	8.44%	8.44%	2.81	14.67	0.97	2.02	2.24	1.18%	
Curtiss Wright	CW	1.09%	138.67	150.16	8.29%	8.29%	5.77	17.12	2.30	3.16	0.13	0.47%	
Teledyne Technologies	TDY	2.18%	436.89	472.63	8.18%	8.18%	22.10	24.10	4.79	2.90	1.13	---	
Huntington Ingalls	HII	1.96%	186.74	199.44	6.80%	6.80%	7.99	10.89	0.84	2.84	0.93	2.37%	
Heico	HEI	1.98%	144.22	153.54	6.46%	6.46%	18.64	51.35	9.62	9.05	5.14	0.12%	
Kratos Defense & Security	KTOS	0.73%	19.40	20.48	5.57%	5.57%	2.55	38.64	3.15	2.69	27.67	---	
Booz Allen	BAH	2.64%	84.79	87.84	3.60%	3.60%	11.71	19.22	1.44	10.94	2.08	1.96%	
CAE	CAE	2.26%	25.24	26.08	3.33%	3.33%	8.27	27.17	2.50	2.10	6.57	---	
Transdigm	TDG	3.23%	636.28	651.54	2.40%	2.40%	36.14	30.56	7.40	13.71	1.69	---	
Kaman	KAMN	0.27%	43.15	43.48	0.76%	0.76%	1.21	19.07	1.71	1.52	2.14	1.84%	
	TTMI	0.14%	14.90	14.82	-0.54%	-0.54%	1.51	10.08	0.67	1.05	0.59	---	
Jacobs Engineering	J	1.37%	139.23	137.81	-1.02%	-1.02%	17.81	16.89	1.26	2.93	1.58	0.61%	
Iridium	IRDM	0.33%	41.29	40.32	-2.35%	-2.35%	5.25	144.00	8.54	4.11	---	---	
Textron	TXT	3.28%	77.20	74.38	-3.65%	-3.65%	16.09	17.97	1.30	2.37	0.88	0.11%	
Boeing Co	BA	7.03%	201.32	191.50	-4.88%	-4.88%	113.06	25.84	1.82	7.52	3.27	---	
Ball Corp	BLL	1.19%	96.27	90.00	-6.51%	-6.51%	28.94	19.03	2.10	7.93	1.50	0.89%	
Honeywell Intl	HON	5.21%	208.51	194.58	-6.68%	-6.68%	133.45	20.08	3.88	7.18	2.14	2.01%	
OSI Systems	OSIS	0.26%	93.20	85.12	-8.67%	-8.67%	1.51	13.30	1.28	2.45	1.83	---	
Oshkosh Truck	OSK	0.80%	112.71	100.65	-10.70%	-10.70%	6.70	11.30	0.84	2.19	0.62	1.36%	
AXON International Inc.	AXON	2.79%	157.00	137.73	-12.27%	-12.27%	9.77	58.86	11.32	9.32	3.74	---	
Aerojet Rocketdyne	AJRD	0.86%	46.76	39.35	-15.85%	-15.85%	3.17	18.65	1.45	5.91	1.65	---	
Vectrus	VEC	0.11%	45.77	35.86	-21.65%	-21.65%	0.42	8.15	0.24	1.20	---	---	
Keysight Tech.	KEYS	0.94%	206.51	157.97	-23.50%	-23.50%	28.75	20.87	5.74	7.55	2.21	---	
	VSEC	0.17%	60.83	46.09	-24.23%	-24.23%	0.59	11.05	0.78	1.41	0.77	0.87%	
Palantir	PLTR	1.10%	18.21	13.73	-24.60%	-24.60%	28.52	52.81	18.49	12.16	1.57	---	
Comtech	CMTL	0.12%	23.69	15.69	-33.77%	-33.77%	0.42	16.52	0.80	0.89	1.92	2.55%	
Telos Corp.	TLS	0.15%	15.42	9.97	-35.34%	-35.34%	0.68	14.24	2.79	3.69	---	---	
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Data Provided by Morningstar, Yahoo Finance/Thomson Reuters (PEG), Morningstar (div)