



**Commentary**

Defense stocks continued to trend upwards in the early part of the year after a post-election surge. After nearly doubling up the broader markets in the previous quarter its hard to complain about a better than 4% gain even if it slightly underperformed the market.

**Let's Make a Deal**

Statistically, PriceWaterhouseCoopers said that deals slowed during the first three months of the year but perhaps because of the activity in the fourth quarter [and the closings in 1Q17] it didn't feel that way to us. They do forecast that activity will pick up over the remainder of 2017 and that should be good news to investors in the sector and products that track the SPADE Defense Index since it includes a number of smaller and mid-cap defense firms.

Overall, PwC highlighted 10 deals valued at \$13.8 billion in the first quarter, a decline of about 20% compared with the previous quarter. Strategic investors (as is typical in the A&D sector) contributed around 90% of transaction volume and 95% of deal value in the quarter.

PwC's national leader for its A&D practice said that the 10-year average for M&A volume is approximately \$25 billion and he believes that there is still "\$18 billion or more" worth of new deals still to come in 2017.

The truth is, while all the attention is focused on how well defense stocks are performing post-election and how well companies operating in this sector are anticipated to do in light of the rising defense budget proposals by the White House, what has been lost are the increasing number of higher profile mergers and acquisitions that have caught our eye.

\* \* \*

**Some of the deals affecting SPADE Defense Index constituents**

9 Mar 17—KEYW, a cyber and geospatial services contractor, purchased Sotera Defense Solutions for \$235M in a push to add new and complementary work with the intelligence community.

**SPADE Defense Index Statistics**

3/31/17 Close	5056.93
12/31/16 Close	4859.74
All-time Intraday High: 1 March 2017	5222.84
All-time Closing High: 1 March 2017	5214.91

	SPADE Defense	S&P500
1Q2017	4.06%	5.53%
2016	17.95%	9.54%

**SPADE Defense Index  
March 2017 Rebalance**

The following companies were added to the index

- Ducommun (NYSE: DCO)
- Elbit (NASDAQ: ESLT)

**Corporate Actions Affecting the  
Index During the Quarter**

KEYW acquired Sotera for \$235M (About 1/3 the market cap of the new company).

DigitalGlobe was acquired by MDA (TSX, Toronto).

**Licensed Products**

**Exchange Traded Fund  
(ETF)**

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

**1Q17 Leaders**

1	Mercury Computer	29.22%
2	Comtech	24.39%
3	Aerojet Rocketdyne	20.89%
4	BWX Technologies	19.90%
5	DigitalGlobe	14.31%
6	Boeing	13.60%
7	Heico	13.03%
8	Orbital ATK	11.71%
9	Cubic Corp	10.11%
10	Huntington Ingalls	8.71%

**4Q16 Laggards**

1	Mantch Intl	-19.93%
2	Engility	-18.04%
3	SAIC	-14.12%
4	Transdigm	-11.57%
5	KBR	-9.95%
6	CSRA	-8.01%
7	Curtiss Wright	-7.22%
8	Vectrus	-7.22%
9	TASER	-5.98%
10	CACI	-5.63%

**1Q17 Results**

1	Mercury Computer	29.22%	26	Northrop Grumman	2.26%
2	Comtech	24.39%	27	AAR	1.75%
3	Aerojet Rocketdyne	20.89%	28	FLIR Systems	0.25%
4	BWX Technologies	19.90%	29	Leidos	0.00%
5	DigitalGlobe	14.31%	30	Ball Corp	-1.08%
6	Boeing	13.60%	31	Kaman	-1.63%
7	Heico	13.03%	32	Woodward	-1.64%
8	Orbital ATK	11.71%	33	Booz Allen	-1.89%
9	Cubic Corp	10.11%	34	Textron	-2.00%
10	Huntington Ingalls	8.71%	35	Triumph Group	-2.83%
11	L-3	8.66%	36	Esterline ETch	-3.53%
12	Harris	8.59%	37	Viasat	-3.62%
13	General Dynamcis	8.42%	38	OSI Systems	-4.11%
14	Honeywell	7.79%	39	CACI	-5.63%
15	Raytheon	7.39%	40	TASER	-5.98%
16	Lockheed Martin	7.07%	41	Vectrus	-6.29%
17	Oshkosh Truck	6.16%	42	Curtiss Wright	-7.22%
18	Hexcel	6.05%	43	CSRA	-8.01%
19	FireEye	5.97%	44	KBR	-9.95%
20	Kratos Defense	5.14%	45	Transdigm	-11.57%
21	Rockwell Collins	4.74%	46	Sparton	-1.99%
22	AeroVironment	4.47%	47	SAIC	-12.26%
23	Teledyne Tech	2.81%	48	Engility	-14.12%
24	Moog	2.54%	49	Mantech	-18.04%
25	United Technologies	2.36%	50	Key W	-19.93%

**ETF Statistics (NYSE: PPA)  
Powershares Aerospace & Defense**

Exchange / Ticker Symbol:	NYSE / PPA
Assets ( 3/31/17)	\$538.4 M
Closing Price (3/31/17)	\$43.55
Yield (TTM)	1.49%
1Q2017 Volume	6,669,500
Turnover	16%

source: Yahoo Finance 2/28/17

Portfolio Price / Earnings*	20.06
Portfolio Price / Book*	3.97
Portfolio Price / Sales*	1.51
Portfolio Price / Cash Flow*	12.81
Earnings Growth Rate*	9.53%
Beta (3 year)*	0.82
Alpha (3 year)*	7.90
R-squared (3 years)*	49.96

source: Yahoo Finance 2/28/17

**Commentary** (continued from page 1)

8 Mar 17—Leonardo (once Finmeccanica)... bought Daylight solutions for approx. \$150M. Daylight makes quantum cascade laser platforms; Leonardo (Italy) is the parent corporation of defense contractor, DRS.

8 Mar 17—Intelsat bought an equity stake in Kymeta satcom antenna manufacturer following joint efforts to develop the Kalo satellite services and antenna technologies.

1 Mar 17—Investment firm KKR spent \$1.2 billion to purchase the defense electronics business of France's Airbus Group. The deal concluded at the end of February but was first announced in March 2016 as part of the company's reorganization. Airbus will maintain a 25.1% minority stake.

24 Feb 17—Canada's MacDonald Dettwiler acquired DigitalGlobe (NYSE: DGI) for an estimated \$3.6B expanding their footprint in the global satellite imagery market. MDA will pay \$2.4B in cash and stock and assume \$1.2B in debt. DigitalGlobe provides high-res Earth imagery to US defense and intel agencies. DGI will operate as a subsidiary of SSL MDA Holdings, the parent company created in late 2016 to obtain eligibility for classified space contracts with the US government and will reorganize to ensure that by 2019 it is on the US Access plan. MDA plans to dual list on the NYSE. In 2016, DGI bought The Radiant Group (\$140M) a geospatial data services provider and Timbr (science and analytics)

24 Feb17—TransDigm bought Takata Corp's aerospace and defense business for \$90M in cash and includes their Schroth Safety Products and Takata Protection Systems

23 Feb17—Aerojet Rocketdyne bought L3 Coleman Aerospace for \$15M cash for its systems engineering and mission analysis expertise.

21 Feb17—LMI Aerospace (LMIA) will be acquired by Sonaca (London UK) for \$14/share. LMIA clients including Boeing, Spirit Aerosystems, and Gulfstream.

Sonaca's aerosturcture clients include Airbus and Embraer.

27 Jan17 – Harris sold its govt info tech services business to private equity firm, Veritas Capital, for \$690M as part of its restructuring. The unit serves NASA's Space Communications Network and Deep Space Network. Harris' air traffic management business is not part of the deal.

**Trend: IT shedding:**

Lockheed Martin, Harris, CSC/CSRA, and L-3 have all shed some of their IT activities in recent months

25 Jan 17 – Booz Allen concluded its acquisition of Aquilent, also known as eGov Holdings, for \$250M as part of its effort to grow digital services offering.

18 Jan 17—A \$9.4 billion merger of French jet engine maker Safran with aircraft interior manufacturer Zodiac Aerospace. The combination will unite Safran activities in turbines, landing gear, brakes and avionics with Zodiac's cabin interiors, fuel, lighting, safety and power-distribution gear.

9 Jan 17—Engility sold its USAID business for \$24M as part of its efforts to pay down debt and reshape portfolio.

6 Jan17—LE Tech, completed purchase of Implant Sciences' explosive trace detection business for \$117.56M in cash.

5 Jan17—Curtiss Wright concluded its \$233M cash acquisition of Teletronics Tech Corp as part of its efforts to expanded data acquisition tech offerings.

3 Jan 17—Harris completed the \$425M sale of CapRock maritime communications business to SpeedCast Intl to help pay down debt.

In February, General Dynamics said it is looking for M&A but they haven't found anything compelling from a fit, price, or rationale perspective other than a few small deals.

**Performance (ex div)**

	SPADE Defense Index	S&P500	Alpha (bps)
2016	<b>17.95%</b>	9.53%	842
2015	<b>3.23%</b>	[0.73%]	396
2014	<b>11.77%</b>	11.39%	38
2013	<b>48.27%</b>	29.60%	1867
2012	<b>16.30%</b>	13.41%	289
2011	[2.75%]	<b>[0.00%]</b>	[275]
2010	9.62%	<b>12.78%</b>	[316]
2009	21.71%	<b>23.45%</b>	[174]
2008	<b>[38.03%]</b>	[38.49%]	46
2007	<b>22.17%</b>	3.53%	1864
2006	<b>19.33%</b>	13.62%	571
2005	<b>5.30%</b>	3.00%	230
2004	<b>20.47%</b>	8.99%	1148
2003	<b>37.27%</b>	26.38%	1089
2002	<b>[2.87%]</b>	[23.37%]	2050
2001	<b>0.94%</b>	[13.04%]	1488
2000	<b>4.98%</b>	[10.14%]	1512
1999	15.31%	19.53%	[422]
1998	6.63%	26.67%	[2004]



1-Year Chart Comparing the Powershares Aerospace & Defense ETF “PPA” (black) with the S&P500 (yellow)

**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, homeland security, and space.

The Index is designed to reflect the broad diversity of activities that is representative of companies involved with the sector – including industrial firms that manufacture aircraft, tanks, ships, and missiles; and those involved with current and next generation systems related to network centric warfare and information technology; intelligence, surveillance, and reconnaissance; satellites; border security; and defense systems that protect the lives of our servicemen and servicewomen.

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

**Rules**

The Index was designed to be RIC (registered investment company) compliant for the purpose of enabling financial products. Companies are required to meet a variety of eligibility criteria including market valuation, liquidity, and listing on a major U.S. exchange. Full details are available on our website.

- \* Market Cap: Minimum \$100M
- \* Share Price: Minimum \$5.00
- \* Sufficient Liquidity

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End of 1Q17		3/28/2017					Market	Forward	Price/	Price/	PEG	
		Percent	31-Dec-16	31-Mar-17	YTD	QTD	Cap	P/E	Sales	Book	5 yr	Div Yld
Company	Ticker	Weight	Price	Price	% Ch	% Ch	intraday	(ttm)	ttm	mrq	expected	forward %
AAR Corp	AIR	0.33%	33.05	33.63	1.75%	1.75%	1.15	18.38	0.68	1.3	1.26	0.91%
Aerojet Rocketdyne	AJRD	0.44%	17.95	21.70	20.89%	20.89%	1.50	80.97	0.91	43.17	1.31	
AeroVironment	AVAV	0.18%	26.83	28.03	4.47%	4.47%	0.64	57.20	2.86	1.85	-4.33	
Boeing Co	BA	7.51%	155.68	176.86	13.60%	13.60%	107.55	23.24	1.15	134.43	1.29	3.20%
Booz Allen	BAH	1.56%	36.07	35.39	-1.89%	-1.89%	5.31	18.82	0.94	9.32	2.44	1.75%
Ball Corp	BLL	3.76%	75.07	74.26	-1.08%	-1.08%	13.00	45.56	1.42	3.75	1.95	0.70%
BWX Technologies (1July15 split)	BWXT	1.37%	39.7	47.6	19.90%	19.90%	4.75	21.94	3.06	31.5	2.19	0.76%
Caci Intl	CACI	0.84%	124.30	117.30	-5.63%	-5.63%	2.86	17.17	0.68	1.69	2.76	
Comtech	CMTL	0.10%	11.85	14.74	24.39%	24.39%	0.35	32.76	0.64	0.76	1.45	2.67%
Rockwell Collins	COL	3.70%	92.76	97.16	4.74%	4.74%	12.68	17.37	2.44	5.84	2.19	1.34%
CSRA Inc. (16Nov15 split)	CSRA	1.39%	31.84	29.29	-8.01%	-8.01%	4.78	24.72	0.97	15.98	1.48	1.36%
Cubic Corp	CUB	0.41%	47.95	52.80	10.11%	10.11%	1.43	25.14	0.96	2.13	0.59	0.52%
Curtiss Wright	CW	1.17%	98.36	91.26	-7.22%	-7.22%	4.06	18.55	1.93	3.12	2.52	0.57%
Digital Globe	DGI	0.58%	28.65	32.75	14.31%	14.31%	2.02	55.51	2.79	1.71	306.87	
Engility	EGL	0.29%	33.70	28.94	-14.12%	-14.12%	1.06	---	0.50	1.49	-2.72	
Esterline Technologies	ESL	0.72%	89.20	86.05	-3.53%	-3.53%	2.55	22.69	1.27	1.62	1.55	
FireEye	FEYE	0.62%	11.90	12.61	5.97%	5.97%	2.24	-210.17	3.19	2.61	-1.53	
Flir Systems	FLIR	1.42%	36.19	36.28	0.25%	0.25%	4.95	17.53	2.98	2.95	1.25	1.65%
General Dynamics	GD	7.10%	172.66	187.20	8.42%	8.42%	56.67	17.73	1.81	5.14	2.10	1.79%
Heico	HEI	1.68%	77.15	87.20	13.03%	13.03%	5.37	31.25	3.80	5.86	3.26	0.21%
Huntington Ingalls	HII	2.73%	184.19	200.24	8.71%	8.71%	9.22	17.04	1.30	5.60	2.56	1.20%
Honeywell Intl	HON	7.16%	115.85	124.87	7.79%	7.79%	94.99	20.14	2.43	4.93	2.55	2.12%
Harris Corp	HRS	4.02%	102.47	111.27	8.59%	8.59%	13.85	18.15	1.87	4.38	0.48	1.91%
Hexcel	HXL	1.42%	51.44	54.55	6.05%	6.05%	4.95	20.58	2.49	4	1.99	0.81%
Kaman	KAMN	0.38%	48.93	48.13	-1.63%	-1.63%	1.30	17.01	0.82	2.31	1.94	1.54%
KBR	KBR	0.58%	16.69	15.03	-9.95%	-9.95%	2.15	10.81	0.50	2.84	58.8	2.13%
KEY W Holding	KEYW	0.12%	11.79	9.44	-19.93%	-19.93%	0.46	47.20	1.6	1.63	3.36	
Kratos Defense & Security	KTOS	0.17%	7.40	7.78	5.14%	5.14%	0.66	22.88	0.99	2.08	8.68	
Leidos	LDOS	2.27%	51.14	51.14	0.00%	0.00%	7.69	21.76	1.10	2.46	2.14	2.49%
L-3 Communications Hldgs	LLL	3.73%	152.11	165.29	8.66%	8.66%	12.86	17.60	1.22	2.80	3.00	1.81%
Lockheed Martin	LMT	7.20%	249.94	267.6	7.07%	7.07%	77.56	15.30	1.65	51.75	2.50	2.69%
Mantech International'a'	MANT	0.39%	42.25	34.63	-18.04%	-18.04%	1.34	22.34	0.84	1.08	7.56	2.43%
Moog Inc.	MOGA	0.67%	65.68	67.35	2.54%	2.54%	2.42	18.69	0.98	2.42	---	
Mercury Computer Sys	MRCY	0.45%	30.22	39.05	29.22%	29.22%	1.87	48.81	5.56	3.16	5.41	
Northrop Grumman	NOC	5.22%	232.58	237.84	2.26%	2.26%	41.53	17.83	1.69	7.92	2.67	1.51%
Orbital ATK (merged 2/10/15)	OA	1.66%	87.73	98.00	11.71%	11.71%	5.64	19.60	1.30	2.94	1.64	1.29%
OSI Systems	OSIS	0.40%	76.12	72.99	-4.11%	-4.11%	1.40	69.12	1.56	2.56	1.45	
Oshkosh Truck	OSK	1.46%	64.61	68.59	6.16%	6.16%	5.12	18.19	0.82	2.58	1.43	1.17%
Raytheon Co	RTN	5.58%	142.00	152.50	7.39%	7.39%	44.66	20.49	1.86	4.46	1.73	1.93%
SAIC	SAIC	1.10%	84.80	74.40	-12.26%	-12.26%	3.26	18.33	0.73	9.17	3.92	1.67%
Spartan	SPA	0.06%	23.85	20.99	-11.99%	-11.99%	0.21	14.32	0.51	2.6	1.59	
TASER International Inc.	TASR	0.34%	24.24	22.79	-5.98%	-5.98%	1.19	30.39	4.45	7.90	1.94	
Transdigm	TDG	3.34%	248.96	220.16	-11.57%	-11.57%	11.63	25.73	3.54	-6.27	2.55	
Teledyne Technologies	TDY	1.27%	123.00	126.46	2.81%	2.81%	4.45	21.33	2.07	2.86	0.80	
Triumph Group	TGI	0.35%	26.50	25.75	-2.83%	-2.83%	1.28	6.44	0.64	0.76	1.45	0.63%
Textron	TXT	3.65%	48.56	47.59	-2.00%	-2.00%	12.85	13.49	0.93	2.29	2.26	0.17%
United Technologies	UTX	6.80%	109.62	112.21	2.36%	2.36%	89.96	18.34	0.20	2.03	2.32	2.34%
Vecrus	VEC	0.07%	23.85	22.35	-6.29%	-6.29%	0.24	10.35	0.91	2.03	---	
Viasat Inc	VSAT	1.03%	66.22	63.82	-3.62%	-3.62%	3.68	93.85	2.40	2.12	2.40	
Woodward	WWD	1.21%	69.05	67.92	-1.64%	-1.64%	4.17	18.46	2.06	3.41	1.73	0.74%

Data Provided by Yahoo Finance, Thomson Reuters (P/E, PEG), Morningstar (div)