

OPERATION ALEPPO

Russia's War in Syria

**The Inside Story of
Putin's Military
Intervention in the
Syrian War**

TIM RIPLEY

OPERATION ALEPPO:

RUSSIA'S WAR IN SYRIA

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Operation Aleppo

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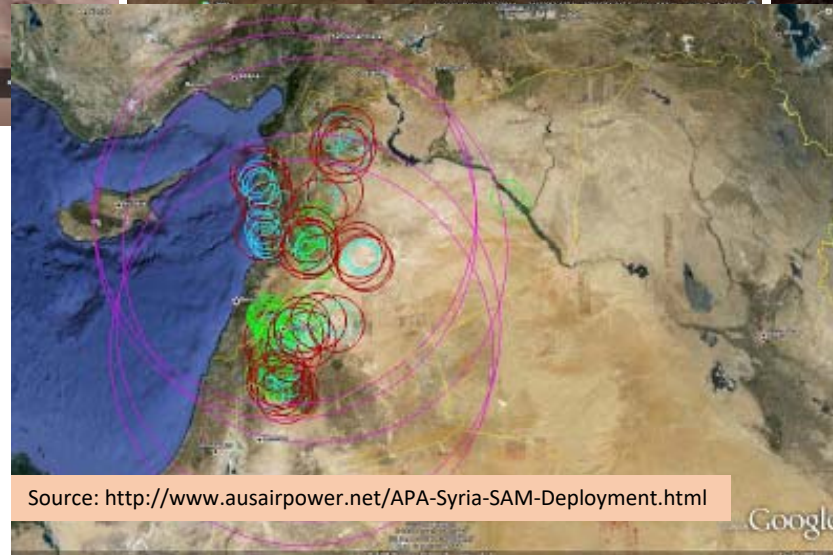
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Syria's Air Defence

The Syrian Arab Air Defence Force (SyADF) and Russian Air Defence Forces

10th April 2018



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SyADF Surface to Air Missiles (SAMs)



9K33 Osa (SA-8)
Mobile Tactical SAM, supports army units
Radar guided missiles
Range: 15 km
Source:
http://worlddefencenews.blogspot.co.uk/2013_08_01_archive.html



S-125 Neva/S-125M Pechora (SA-3)
Strategic Level SAM, operates from fixed sites
Mobile version.
Radar guided missiles
Range: 35 km
Source: SANA



9K37 Buk M1-2+M2 (SA-17)
Operational Level SAM, mobile or fixed site
Radar guided missiles
Range: 30 km
Source: SANA



S-75 Dvina/S-75M Volga (SA-2)
Strategic Level SAM, operates from fixed sites
Range: 45 km
Source: via Charles Lister



9K31 Strela-1 (SA-9)
Mobile Tactical SAM, supports army units
Heat seeking missiles
Range: 3.7 km
Source: stock image



9M311-1M Tunguska (SA-19)
Mobile Tactical SAM, supports army units
Radar guided missiles, and guns
Range: 8 km (missile)
No images have emerged of this system in SyADF service. Raising questions about if they have been delivered.
Source: Stock image



S-200 Angara (SA-5)
Strategic Level SAM, operates from fixed sites
Radar guided missiles
Range: 300 km
Source: Stock image



9K35 Strela-10 (SA-13)
Mobile Tactical SAM, supports army units
Range: 5 km
Source: US DoD



Pantsir-S1 (SA-22)
Mobile Tactical SAM, for point defence of strategic bases
Radar guided missiles, and guns
Range: 20 km
Source: Stock Image



2K12 Kub (SA-6)
Operational Level SAM, mobile or fixed site
Radar guided missiles
Range: 24 km

SyADF Organisation 2018

Since 1969 when the SyADF was established along Soviet lines it has been an independent branch of the Syrian Armed Forces.

The SyADF is responsible for operating the Syrian integrated air defence system (IADS), which comprises an early warning radar network, surface-to-air missile (SAM) and anti-aircraft artillery (AAA) batteries, and the command and control network to link them all together, as well as provide ground control intercept (GCI) services for SyAAF fighter aircraft.

In the early 1980s, when the SyADF was at its peak with some 40,000 personnel and more than 600 SAM launchers, assigned to 150 batteries. As its 1960s and 1970s era SAMs became increasingly obsolete after the turn of the century, the SyADF began retiring missile launchers and slimming down its force structure. Immediately prior to the start of the civil war in 2011, it boasted 36,000 personnel and 130 missile batteries. Only some 10,000 SyADF personnel were long service professional officers or technical experts. The remainder were conscripts who provided ground security of missile sites, provided administrative or logistic services and manned anti-aircraft guns providing close protection of SAM sites.

The civil war had a major impact on the SyADF. The Syrian armed forces conscription system broke down, with more than two thirds of the SyADF's conscripts deserting and the army getting priority for any new conscripts who did report for duty. This has similarly impacted on the SyADF with only 4-5,000 of its conscripts remaining in service with almost all of the 10,000 professionals remaining on duty, giving a total strength of an estimated 14,000 SyADF personnel. Around a third of the SAM fixed missile battery positions were over run by rebel forces, including almost all the missile sites in the Aleppo region, many along the Golan Heights, as well as to the south and east of Damascus. A divisional SyADF under ground operations centre in north east Damascus was captured by rebels in 2012.



Osa
Source: @galandecZP

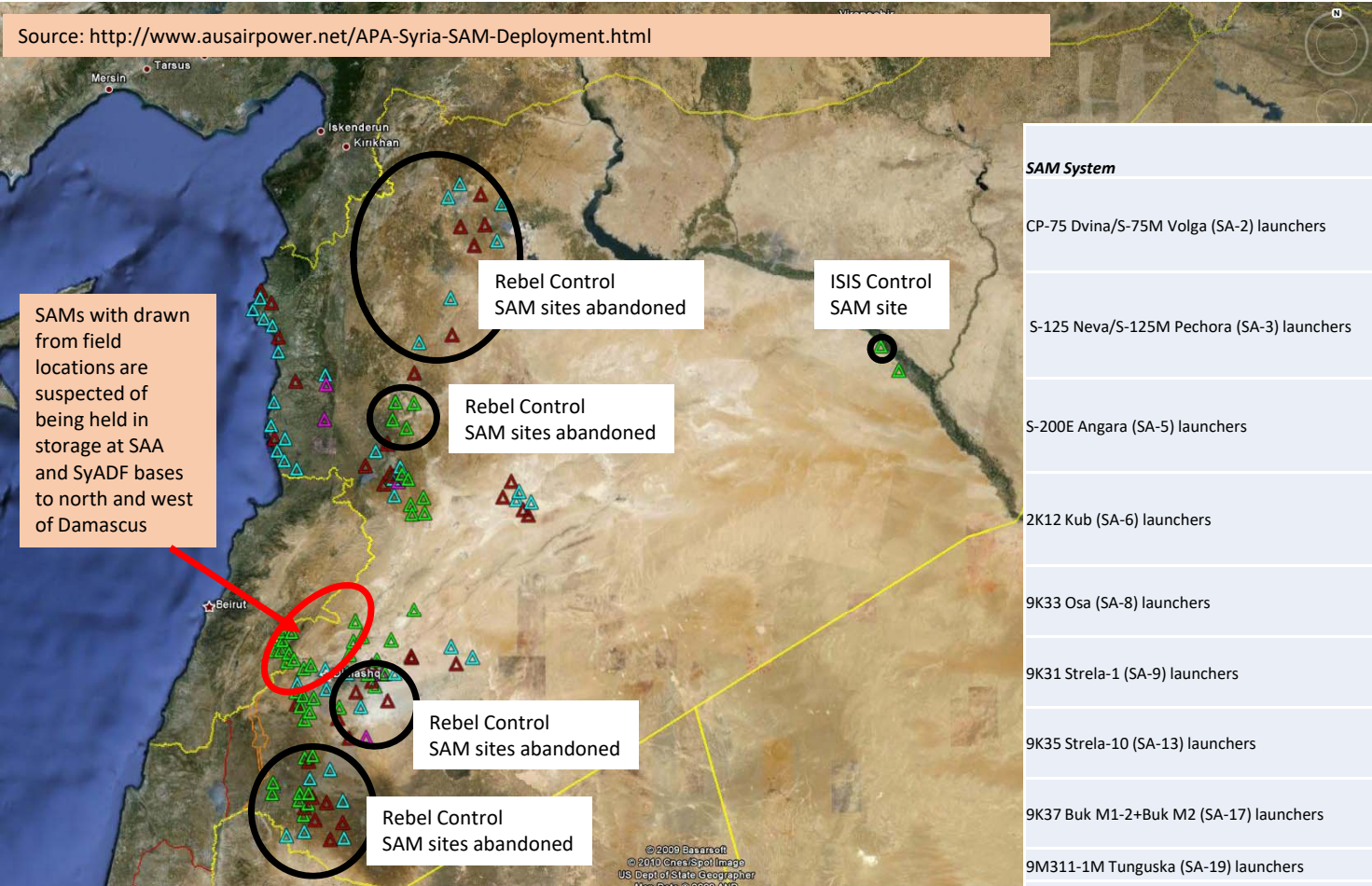


Mobile S-125M Pechora
Source: SANA

SyADF SAM fixed SAM Sites and Inventory, 2011-2016

In 2011 there were 131 active SAM sites inside of Syria
 S-75 (SA-2) red
 S-125 (SA-3) blue
 S-200 (SA-5) purple
 2K12 (SA-6) green

Source: <http://www.ausairpower.net/APA-Syria-SAM-Deployment.html>



Source: <http://www.ausairpower.net/APA-Syria-SAM-Deployment.html>

SAM System	Pre-war Launchers	First Delivered	status 2011	Estimated status 2018
CP-75 Dvina/S-75M Volga (SA-2) launchers	320	1969	37 batteries active (6 launchers each site/battery)	8 batteries active (total 52 launchers) 5 Regiments (2,500 personnel)
S-125 Neva/S-125M Pechora (SA-3) launchers	160	1971	39 batteries active (4 launchers each site/battery)	12 batteries active (total 471 launchers, including 12 S-125M launchers) 6 Regiments (3,000 personnel)
S-200E Angara (SA-5) launchers	48	1984	5 batteries active (6 launchers each site/battery)	2 batteries active (total 8 launchers) 1 Regiment (500 personnel)
2K12 Kub (SA-6) launchers	200	1973	50 batteries active (4 launchers each)	12 batteries active (total 50 launchers) 5 Regiments (2,500 personnel)
9K33 Osa (SA-8) launchers	60	early 1980s		50% in service? 1 Regiment (500 personnel)
9K31 Strela-1 (SA-9) launchers	20	1970s		?? 5 Batteries (750 personnel)
9K35 Strela-10 (SA-13) launchers	35	1980s		all in service 8 Batteries (1,200 personnel)
9K37 Buk M1-2+Buk M2 (SA-17) launchers	8	2011		all in service 1 battery (150 personnel)
9M311-1M Tunguska (SA-19) launchers	6?	2008?		From Iran? Not confirmed
antsir-S1E (SA-22) launchers	36	2008		all in service 2 Regiment (500)?

SyADF Early Warning Radar Network

Concept of Operations

After the EW radar network detects hostile aircraft, regional ground control intercept (GCI) command posts would assigned individual SAM batteries of SyAAF fighter aircraft to engage the target.

Adandoend radar at Marj al Sultan, 2015
Source: @iavnsidorenko



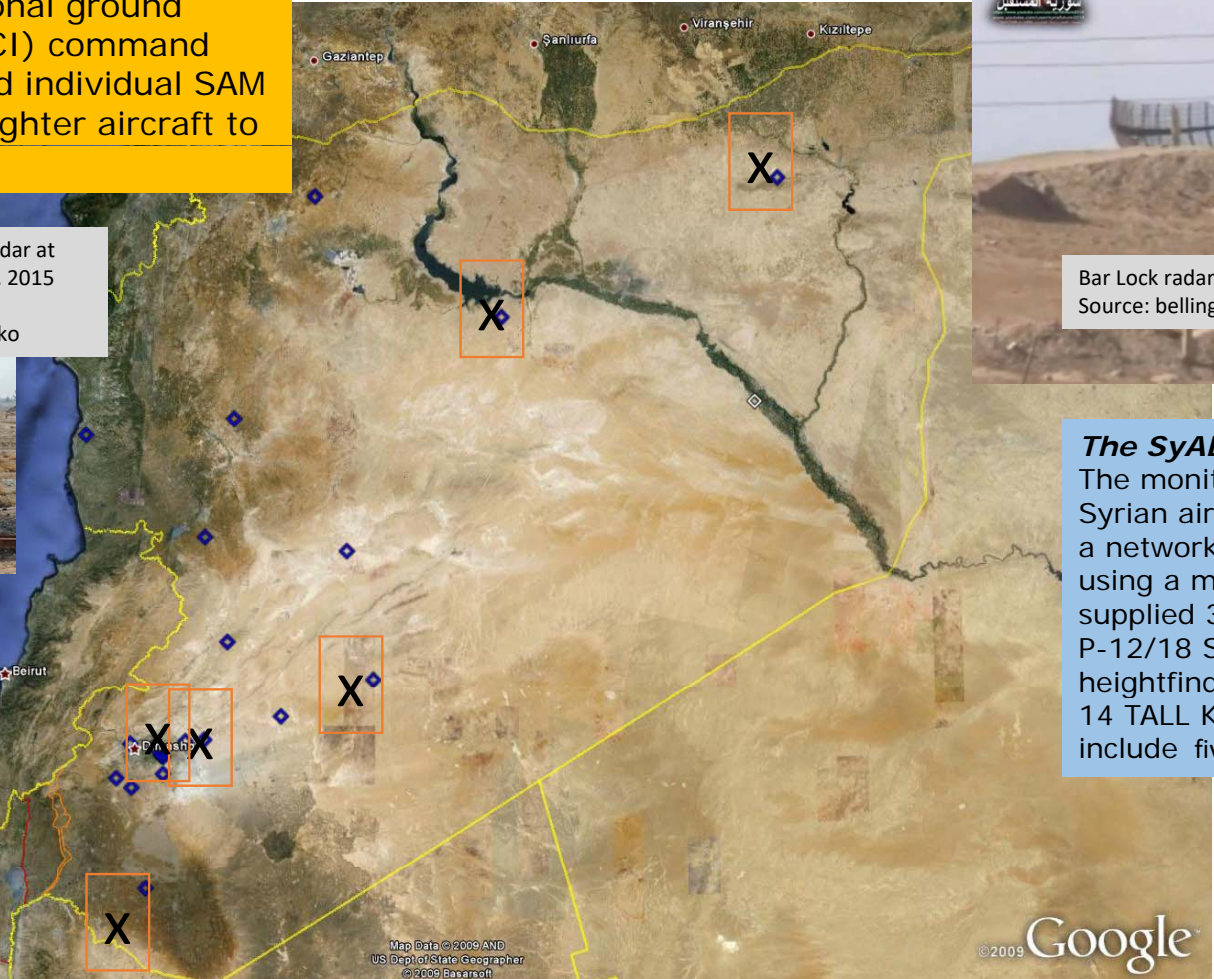
Bar Lock radar at T4 airbase
Source: bellingscat.com



The SyADF Early Warning Network
The monitoring of air activity in and around Syrian air space before 2011 was carried out by a network 22 Early Warning (EW) radar sites, using a mix of radars, including Russian/Soviet supplied 36D6 TIN SHIELD P-35/37 BAR LOCK, P-12/18 SPOON REST, PRV-16 THIN SKIN heightfinder, 5N87/P-80 BACK NET, and 5N84/P-14 TALL KING. Chinese supplied radars include five JY-27s, four Type 120s, and a single JYL-1

The EW network in 2016

Several sites in early warning radar network have been overrun by rebels or abandoned. As marked X.



Source: <http://www.ausairpower.net/APA-Syria-SAM-Deployment.html>

Eye alt: 466.32 mi

SyADF Activity 2011-2018

SyADF operations are cloaked in secrecy by the Damascus government because of the force's role on countering Israeli incursions into Syrian air space. Since the start of the civil war, as more territory has fallen to rebels the SyADF has pulled its best SAMs back into heavily protected bases. The imagery that has appeared of the SyADF SAMs and bases shows the force in retreat. The fact that Israeli air raids in Jan and May 2013, and in December 2015, all involved the use of stand-off weapons, launched from outside Syrian territory suggests that considerable SyADF air defence systems are operational, at least, around the Damascus region. The Israeli air force, clearly still considers it necessary to be cautious about incursions into Syrian air space.

On 10th Feb 2018 the SyADF shot down a Israeli F-16 during an air raid across the Golan Heights. In retaliation the IDF claimed to have bombed 3 SyADF SAM battery, effectively reducing its capability by 50%. This BDA was unconfirmed.



SA-17 being moved into Mezze AB, May 2013, Source: Syrian Revolution Documentation Centre



SA-17 at Mezze AB, Sept 2012 Source: Darayya Revolution



SA-6 of Brigade 82 abandoned to rebel forces near Dara'a, Jan 2015 Source: @LUCKASFB

SA-3 at Kwaives Airbase, 2014 Source: <https://www.bellingcat.com/news/2015/05/10/battlefront-syria-kweres-airbase/>



SA-2 at T-4 Airbase, 2014 Source: <https://www.bellingcat.com/news/mena/2015/06/29/fortress-t4-an-airbase-at-war/>



SA-2 captured by rebels, date unknown Source: Juma Al Qassem



SA-22 Pantsjr system in hanger at Latakia AB Source: <http://syria.liveuamap.com/>



Wheel mounted SA-6 at field location in central Syria 2015 Source: FARS news agency

SA-8 operated by rebels in eastern Damascus. Reportedly destroyed by RuAF io 31 Dec 2015 Source: https://www.youtube.com/watch?v=UMZZzBqf_8M



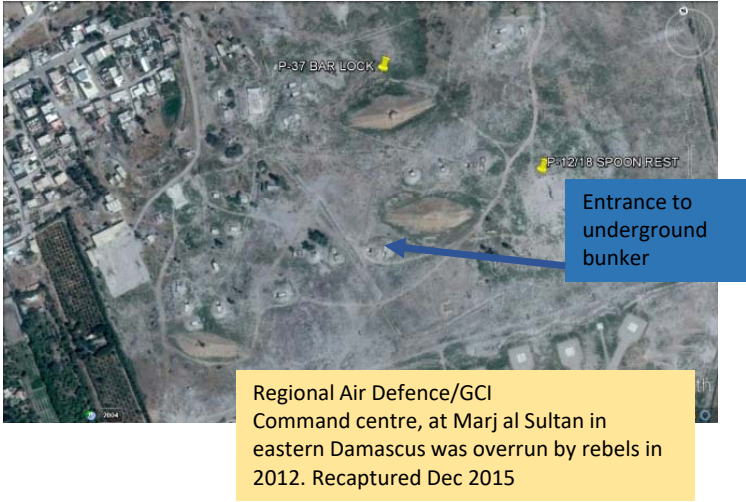
SyADF Command and Control

Satellite Images from Google Earth

The SyADF's IADS is centrally controlled from a hardened underground command post, which is in the Damascus region. The exact location is closely guarded secret. Possible locations include underneath the main MOD building in central Damascus, on a military compound on the northern edge of Damascus or at Mezze airbase in south west Damascus.

The SyADF GCI network of radars and regional command posts, continues to operate and is now used almost exclusively to control air strikes by SyAAF and Russian Air Force aircraft and helicopters against rebel targets, rather than for air defence operations. The radar network in North West is used to monitor Turkish activity along the border and the GCI radar records were used to counter Turkish propaganda after the Russian Su-24 was shot down in November 2015.

One SyADF GCI regional command centre in eastern Damascus was overrun by rebels 2012. The remaining sites are in Latakia province,, southern Damascus and outside Homs city.

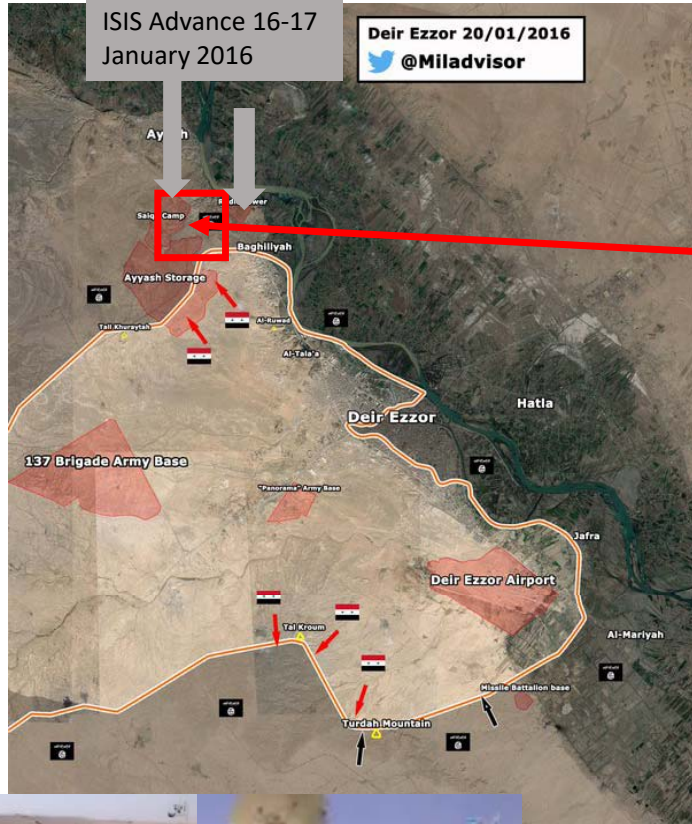


Inside SyADF Command centre
Source: @bm21_grad
14 feb 16

SyADF SA-6 battery captured by ISIS at Dier Ez Zor 16-17 January 2016

ISIS Advance 16-17
January 2016

Deir Ezzor 20/01/2016
@Miladvisor



Google Earth
image, 25 Nov 14



SA-6 Battery Orbat
from "Jane's
Soviet Air Defence
Missiles" by Steven
J Zaloga



4 x Missile Re-load trucks, 1 x SA-6 TEL



Berm with bunker

2 x SA-6 missiles being inspected by ISIS fighters



2 x SA-6 TEL near building



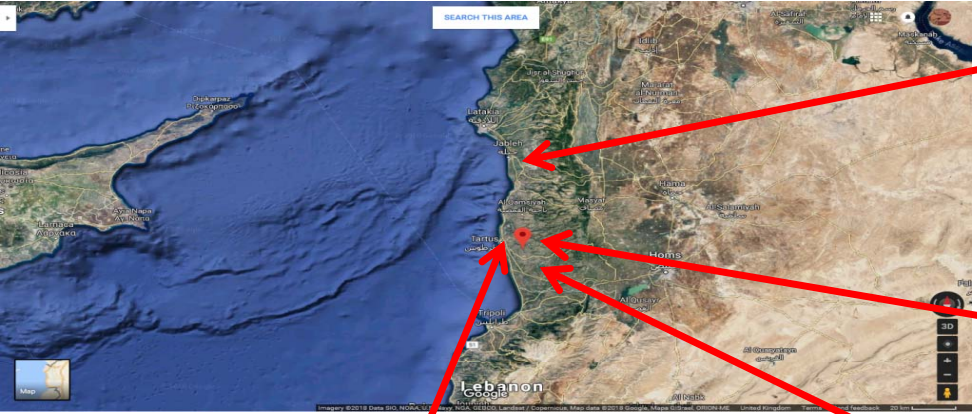
Straight Flush
engagement radar
for SA-6 battery



These image of
Straight Flush
engagement radar
and BRDM command
vehicle appeared on
20 January 2016, on
[@JulianRoepcke](https://twitter.com/JulianRoepcke)

Above 4 images published in Bild newspaper, 23 January 2016
<http://www.bild.de/politik/ausland/isis/flugabwehr-raketen-44246872.bild.html>

Russian Defence Sites in Syria, Nov 2015 to April 2018



S-400 aite at Latakia AB, 3 Feb 16. Since confirmed as still there in recent satellite imagery



bunkers of type usually used for Buk SAM. With entrance to drive in missile launchers

Russian air defence base hill 10km southeast of Tartus. Note large (12m) satellite dishes 12 apr 18, [@obretix](#)



S-300 site near Tartus

Airbus Defence and Space imagery showing a possible deployment site for a Russian S-300V4 SAM system in Tartus.



Pantsir S-1 gun/missile systems defence all S-300/400 sites against drone surveillance . In 2017 the Russians claimed their Pantsir S-2s at Maysaf shot down 3 x Israeli Heron drones near the site.



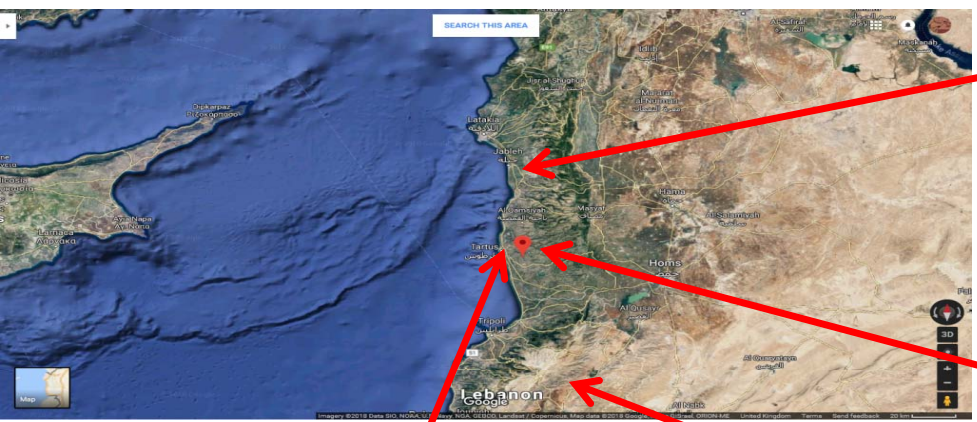
Airbus Defence and Space imagery showing Russian S-400 battery components deployed at a Syrian air defence complex near Maysaf on 2 July. Russian Bastion coastal defence systems launched Oniks missiles at targets inside Syria from the same location in November 2015.

S-400 and P-300 Bastion base near Maysaf (lat 35.165240 long 36.262740).

Pantsir S-1 sites in Syria, Nov 2015 to April 2018

(Pantsir S-1 also reported deployed at Maysaf S-400 site but imagery not available)

Russia Pantsir-S deployment Humaymim Airbase @border9999 18 Apr 18



Pantsir-S deployment at Tartus port @border9999 18 Apr 18

SyADF? Pantsir-S site at Khalhale, south of Damascus (33.179200° 36.570091°) @border9999, 18 Apr 18



SyADF? Pantsir-S (in addition to Pechora 2M) south of Homs (34.628537° 36.771631°) @border9999, 16 Apr 18



Syria-Russian Air Defence Operations

Since the Russians started to deployed air defence systems to protect its airbase at Humaymim in Latakia province, work has been underway to integrate the Russian weapons into a single network with the SyADF.

This network operates in four layers:

High Level

Russian S-400 at Humaymim (Engagement range/altitude: 400km/98,000 ft)

SyADFria's S-200VE (Engagement range/altitude: 300km/130,000 ft)

Mid Level

S-300FM Fort-M naval system on Russian Navy cruisers in Mediterranean (Engagement range/altitude: 150km/98,000 ft)

SyADF Buk-M2E (Engagement range/altitude: 30km/46,000 ft)

Lower Level

SyADF Osa-AKM (Engagement range/altitude: 15km/39,000 ft)

SyADF S-125 Pechora-2M systems (Engagement range/altitude: 35km/18,000ft)

SyADF 2K12 Kub (Engagement range/altitude: 24 km/20,000ft)

Point Defence of key airfields and installations

Pantsir-S1E (SyADF/Russian)

Pantsir-S2 (Russian)

