



[M&A in A&D] DO OR DIE

"Do Or Die" was a rock song released in the early 90's by the psychedelic North-American rock band SteppenWolf, as part of their thirteenth and last album **Rise & Shine** (even though - to be honest - it is far from their iconic albums from the late 60's...). But it was starting like this:

♪ *Come together oh, oh, come together oh, oh
Got nothin' more to show ya, there ain't no more to say
You know the mess we made, it just will not go away
It's what we get for acting like a herd of sheep and swine
It's time to pay the piper and we're running out of time
We got to change the way we do the things we do
And we need everyone aboard to make it through* ♪

Speaking of *coming together*, since the corona virus outbreak, many distressed companies have been looking for support basically everywhere. That includes State-sponsored bail-out packages, extra lines of credits from banks or bonds emissions (like Boeing), temporary Chapter 11 procedure, drastic social measures, special arrangements with OEM's, cash injection from public or private equity investors, or pure and **simple selling out to a supplier, a partner, a competitor, or a customer**. Of course, the crisis was cited as one of the reason for Boeing to walk out of its hi-profile merger with Brazilian planemaker Embraer. And indeed, other previously planned operations – such as Woodward and Hexcel alliance - were put on hold or cancelled, due to cash shortage or excessive lack of visibility. Some like Spirit AeroSystems' bids for Bombardier's aerostructures remain pending, but others such as Mitsubishi buy out of the Bombardier CRJ aircraft family for \$500mn are being completed. If you thought that COVID-19 would freeze M&A activities just as it froze air traffic, industrial output, or social gatherings: think twice. **Those unpredictable and chaotic times are full of opportunities** for both financial and strategic moves. Some prestigious companies otherwise deemed un-acquirable now look within reach. Valuation levels are historically low - for good reasons of course – but are wise investors not supposed to "**buy on the sound of cannons; sell on the sound of trumpets**" – although Warren Buffet clearly does not concur anymore since he abruptly left the airlines industry last week...). At the worst times, there were even rumors of Boeing's selling out... **Think about it: Boeing!** Not your average target, isn't it? That tends to imply that **literally everything is possible!** Names once considered like predators such as Boeing, Airbus, Rolls Royce or General Electric may now be seen as preys.... And quite logically the old-fashioned scenarios such as the recurring Thales and Safran merger are popping here and there. Just wait for an new Airbus-BAE System tie-up to make a come-back! More seriously: who would have thought about **German main shipyards swiftly uniting before talking with shipbuilder Fincantieri** about a 50-50 joint venture to create a European champion? (We shall look at this next week). Well, **maybe Steppenwolf lead singer John Kay just did** when he wrote:

♪ *It's do or die, we got to turn the ship around
It ain't no lie, we're 'bout to burn, we're about to drown
It's do or die, we got to learn or we'll go down together
There ain't no captain here to teach us how to steer
There's just the crew, that's me and you* ♪

Another aspect of the situation is the **vulnerability of many suppliers to opportunistic foreign appetites**. To the point that virtually all governments have raised barriers to such unwelcome acquisitions lately... We shall also look into this trend in more details next week, as it goes along with a **growing – and maybe lasting - inshoring movement**. But as **SteppenWolf** used to sing

♪ *There ain't no easy answer, there ain't no magic tricks
It can't wait until tomorrow, you can't fix it in the mix* ♪



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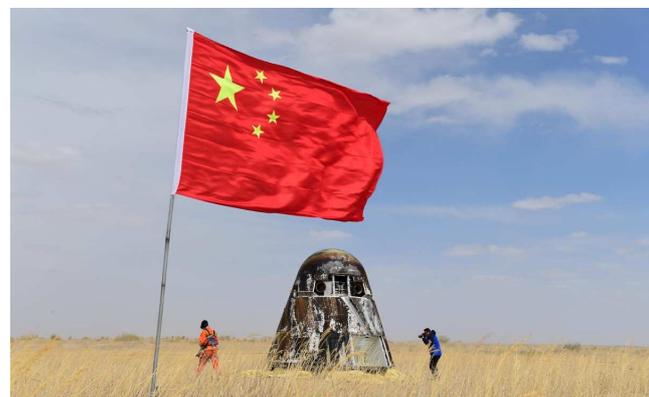
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SNAPSHOTS



On May 6, French **Voltaero** revealed the production configuration for its **Cassio** aircraft, powered by the company's hybrid-electric power module in aft fuselage "pusher" configuration. Produced at a purpose-built final assembly line in the southwest of France, initial deliveries are targeted for the end of 2022, (Credit: Voltaero)



On May 8, The **XZF (Xinyidai Zairen Feichuan)** re-entry capsule of a new manned Chinese spacecraft successfully returned to Earth three days after it was launched in an unmanned test. Touchdown was made in Inner Mongolia, after 2 parachutes and 3 landing airbags successfully deployed (Credit: Weibo).

**POINTS OF VIEW****WORLD: Robots against Coronavirus**

Most countries are slowly getting out of their long-lasting quarantine period and trying to restart their economies whilst monitoring their populations in order to avoid facing a second wave of COVID19 infection. Interestingly, the lockdown episode saw the drone business booming all over the World. Immobile, flying or trundling, heavy or light, in land or at sea, these platforms succeeded in helping public and private stakeholders to fulfill many tasks that would have otherwise required a human presence, potentially vector of the disease which already killed nearly 290.000 people worldwide. According to an analysis from ABI Research, the versatility of mobile robotics should propel the market to **\$23bn by 2021 and \$27.5bn by 2026**. If it turned out that, during the crisis, the selling of drones to private manufacturing industries was a disaster, drone designers and groups directly supplying governments or government-related branches **such as health, security, defense saw their revenues peaking**; and this trend, virus or not, should drastically increase in the years to come. If **regulations differ according to the many countries** regarding drones utilization, the most restricted operations for any companies concern **flying procedures in urban areas**. However, **official agencies such as the FAA have recently eased the procedures** for several companies such as **UPS and Wing** to accelerate their testing in urban areas to deliver light-scale goods 'of primary necessity' such as tooth brushes, pastas or medical drugs to people in critical need. Same assessment in Israel for groups like **Flytrex** where the medical emergency procedures have drastically eased regulations for companies to enable their drone to carry packages up to 6.5 pounds to hundreds of households. However, the fear that a drone failure or a 5-6 kg package not properly attached in an urban area could kill or severely injure people is still there, not to mention collision-risks.

Having this in mind, let's focus on the **several missions undertook by all type of drones during the COVID Crisis**.

Broadcast and monitor – Even if some countries are more or less reticent in buying them for security reasons, **Shenzhen Guangdong province-based DJI has been the leader in providing security forces** with several type of flying drones to broadcast and monitor populations. Founded in 2006, DJI as a share of almost 70% of the consumer drone market worldwide with **Europe as one of its biggest customers**. **Heavily used in several Chinese cities** during the outbreak of the virus, DJI has been gradually equipping France, Spain or Italy's police forces with its

Mavic drones. Carrying HD cameras (day/ night vision), and often combined with loudspeakers, operators would spot groups of people, fly to them and deliver an oral law-enforcement message. More recently, **Boston Dynamics has, in Singapore, deployed "Spot" - one of its 4 legs robot** - in the Bishan-Ang Mo Kio Park for the same mission. If the latter vehicle is (for now) accompanied by a human, it **could be fully autonomous in the coming weeks** and use its cameras to detect and deter groups of people that walk too close to each other's.

Detect and Disinfect – Certain type of drones, made by **Draganfly** for example, are **able to measure respiratory rates and detect infections conditions from a distance of 190ft** thanks to an aircraft mounted system which carries a specialized sensor and computer vision image analysis. Such vehicles whose core missions is to detect symptomatic people could be used in dense areas, in towns, or in places such as airports, railway stations or museums. When a contaminated area is detected, authorities can **use decontamination drones whose vehicles are proposed by FEDS or DJI for example**. The Agras MG1 multi-rotor UAV used by Spanish authorities have the capacity to carry a 10 liters liquid tank as well as a quad-hozzle spray system that **dispense its disinfectants between a 4-6 m width**, and *Jane's* reports that their **omnidirectional radar enables them to carry their missions automatically**. French high-tech company **Bio-UV** has had another interesting idea: the group developed **an anti-COVID scanner mounted with two UV lamps** capable to disinfect areas such as hospital rooms, ambulances, aircraft, schools or other medium-scale surfaces from virus germs.

Deliver – As stated above, the regulations differ according to the countries whose governments requested drones to assist them in their fight against the virus. If the Chinese authorities monitored such flying vehicles to deliver meals to thousands of their citizens under curfew, other private and public actors worldwide adopted them to deliver samples, medicine or other groceries. Rabih Bou Rashid, CEO of FEDS told Business Aviation **"Robots like drones are immune to infection, so many countries have stepped up to get them out in force to deliver medical supplies and other goods. Drones have indeed proven their value to those who are quarantined at home"**. A strong example of this successful collaboration between public and private players took place **in Ghana where the government decided to cooperate with Zipline, a startup whose aim was to rapidly transport sample test from rural areas to urban hospitals** from all over the country in less than an hour. As French weekly *Le Point* reports, this operation enabled the health ministry to rapidly detect epidemiological sites and quickly implement prophylactic measures, enabling the country to adequately manage the spread of the disease and to partially suppress curfews.

Other Uses – With the outbreak of the COVID19 many R&D sections have been inventive in their ways to create today and tomorrow's drones. Other uses we did not mention above also comprise the **acquisition by security forces of smaller drones to patrol along sensible zones such as nuclear reactors, or military sites**. With cuts, and furloughs, personnel have been drastically reduced and the use of **UAVs in industrial operations such as monitoring, sanitizing or moving items** are more than welcome. Other usage includes 4 wheeled robots, equipped with a screen, microphone and receptor whose mission **enable oldest people to communicate with their family remotely**, without taking the risk to be contaminated by medical staff.

If these measures are more than welcomes, for now, by governments in need, the drone market will surely grow at an unprecedented rate in the coming years. Though, many dilemmas would need to bring these matters to the table of debate, especially in democracies. Indeed, recent studies and polls have demonstrated the reticence from parts of the population concerning privacy when it comes to filming or delivery drones, not to mention the fact that, as all electronic devices, these gadgets can be subject to failures or even cyber-attacks which also pose a security problem.

CHINA: Taking off again?

Even if some cities remain under lockdown because of resurgence of sporadic COVID19 clusters here and there, China's economy is slowly restarting and **people are beginning to travel again across the country**. If the International Air Transport Association (IATA) reported that the global industry's revenues would drop by \$314bn in 2020, (representing a 55% decline compared to 2019) and if **International passenger demand in March 2020 shrank about 55.8%**, the picture remains contrasted. According to two travel analytics companies - **Cirium and ForwardKey** - Chinese domestic air travel has been slowly getting back on track **since it had hit the lowest point in mid-February**, with air travel rising by 62% during the week of Feb 23 (compared to a week before). Both groups also confirmed that domestic air traffic in China rose by another 19.5% between the last week of March and the 3rd of April, they also highlighted that **40% of the 1000 aircraft that globally returned in the air during this timeframe (16.800 planes out of 26.300 global fleet are still parked) were Chinese**. As flight capacities in Europe and US are at their lowest due to strict travel restrictions and lockdowns, Cirium analysts the **Chinese domestic market has returned about 30% through May 5th** ahead of national holidays.

But these good news are far from compensating the heavy losses that has hit China's "Big Three" airlines. As underlined by Bloomberg analysts, **China Southern and China Eastern Airlines** lost about Y5.3bn and Y3.8bn respectively between January and March, while China Limited recorded a loss of Y4.8bn over the same time frame. Other carriers such as **Hainan Holding** whose parent HNA group was taken over by the Hainan government in late February, recorded losses of Y6.3bn in Q1. **Big Three are mostly state-owned**. That means that they remain under close watch from the Chinese government, but also that they can benefit from a generous political and financial support. According to *the Economist* "**none has resorted to mass lay-offs and; being state-controlled they can tap government support with fewer strings attached than American firms whose \$58bn bail-out is conditional on suspending payouts to shareholders**". Meanwhile indeed, their European and US counterparts had to drastically review their strategy, ground their fleets, furlough or fire workers, while grappling with wary investors, especially in the US where Warren Buffet's exit move and Dave Calhoun most recent comments sent a shock in Wall Street.

Beside governmental support which enable the main Chinese carriers to decrease risks and re-open some of their routes more easily, it seems that **more overseas airlines are planning to gradually resume International flights to China** as travels bans and other restrictions are starting to ease. According to an article from the Global Times, Qatar Airways aims to re-open 80 destinations by the end of June with 33 routes in the Asia-Pacific and mostly covering Beijing, Shanghai and Guangzhou. Turkish newspaper Anadolu agency recently disclosed that Turkish Airlines would fly to 22 destinations in 19 countries from June as well, aiming states such as Kazakhstan, Afghanistan, Japan and **China with a weekly frequency of 75 flights**. And according to Forbes, other routes to China will also be re-opened in June by Air Canada or United Airlines, who plan to return to cities such as Chengdu, Beijing and Shanghai as well. That said, "*overall U.S.-China flights will decrease in April as Chinese airlines reduce services*" and "*Chinese airlines plan to significantly increase flights in May*", Forbes adds.

Moreover, traffic will be nothing like we were used to before the pandemic, as drastic sanitary measures will be imposed to airlines seeking to get back in the air. Measures such as social distancing, (requiring carriers to ban some of their seats to limit the propagation of the virus, distribution of masks or hydro alcoholic gel etc.) already contributed to raise fares in the Asia-Pacific region. As reported by Brian Pearce, IATA's chief economist "*airfares could soar by 54% for travelers in the region, the highest worldwide, as airline would be*

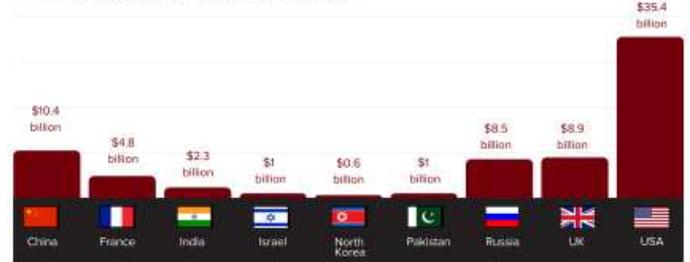
operating at nearly 40% lower capacity if the middle seats were eliminated (...). By removing them, the cost of providing services in higher, eventually, airlines will have to reflect that in fares to have viable operations". A survey made by the association reported that **out of 122 airlines, only 4 could break-even at load factors below 62% with the other 118 being loss-making**. So ticket price evolutions will be a dynamic indicator. As revealed by the South China Morning Post, airfares were 32% lower compared to the year-earlier period, but for example, on April 29, airline ticket prices from Beijing to Hangzhou jumped by more than 700% within half an hour after the Beijing government lowered the city's public health warning level imposed in the wake of the coronavirus outbreak, while overall flight bookings from the Chinese capital surged by 1,500 per cent immediately after the announcement.", even though **strict government oversight will probably limit extreme fares volatility**.

Tomorrow's air travel market is indeed paved with much uncertainty and daunting challenges, but the way the Chinese and broader Asian market are recovering will be key to gauge portions of what the global market might look like in the coming months. Indeed, **there are also signs of recovery in Asia beyond China: as Vietnam has already reopened domestic flights, and India could do the same very soon**, as well as New Zealand and Australia. No doubt that regulators, investors, aircraft manufacturers and competing airlines will surely look very closely at this burgeoning Asian market recovery....

Although awarded with the very prestigious **Nobel Price for Peace in 2017, ICAN (International Campaign to Abolish Nuclear Weapons)** has not lost its ability to talk quite bluntly and go straight to the point as we can witness with its mission statement: **"ICAN is the international campaign to stigmatise, prohibit & eliminate nuclear weapons."**

For the first time, the international organization publishes useful data on military expenditures related to nuclear deterrence. This is a notoriously tricky matter, and figures are often hidden deep into several ministries' account books. However, ICAN manages to give a **useful "educated guess"** for the benefit of the readers:

Total 2019 spending: \$72.9 billion



(Credit Ican)

"That amounts to \$138,699 spent in the world on nuclear weapons per minute. Global nuclear spending rose \$7.1bn from 2018, in line with total military spending" the organization writes... **"The nuclear-armed states spent nearly three-quarters of one hundred billion dollars in 2019 on building and maintaining nuclear warheads and delivery systems. The incalculable human and environmental costs of nuclear weapons only add to this shocking figure. From 2018 to 2019, there was an estimated \$7.1bn increase in nuclear weapon spending, and these totals will only continue to rise in the next decade according to documented nuclear weapon programs and budgets in several nuclear-armed countries"** ICAN adds This short but very clear report, authored by **ICAN Policy and Research Coordinator Alicia Sanders-Zakre**, comes at a time when several countries a grappling with nuclear-weapons and deterrent issues.

For example, Germany is about to make the controversial decision to buy as many as 30 F/A-18E/F Super Hornets (alongside 90 Eurofighters) in order to have a nuclear-capable platform to take-over the NATO nuclear sharing agreement after the Tornado fleet is retired in 2030. Presented as a transitory solution before the Future Combat Air System can perform the task; Germany must file a fighter aircraft capable of dropping the B61 nuclear gravity bomb, as recalled by German business daily *Handelsblatt* earlier this year. Although more resilient, managing such a dual fleet is more costly, and several political factions in Germany are calling for a wider debate on the justification of the NATO requirement, especially when resources are needed to cope with the coronavirus crisis.

In the UK, as reported by Defense News, the parliamentary Public Accounts Committee just revealed that **"poor management on three nuclear projects involving warhead assembly (Lockheed Martin), core**

PUBLICATION

Enough is Enough: Global Nuclear Weapons Spending 2019 ICAN-2020/05/14)



reactor production (Rolls-Royce) and submarine building (Bae Systems) have resulted in combined cost increases of £1.35bn as well as delays of between 1.7 and 6.3 years". Initially, those projects were supposed to cross the £5bn cost ceiling... The Parliamentary committee, who underlined that the cost overruns were caused in large part by avoidable mistakes, such as beginning construction work without mature designs, also feared that the cost "could keep rising"... As recalled by Defense News, the country's nuclear efforts account for about 18-19% of the U.K. defense budget, whereas it is only 6-7 % of the U.S. defense budget. And last February, Defence Secretary Ben Wallace was forced to confirm that Britain is working on a new warhead to equip its Trident missile-armed nuclear submarine fleet – This fleet is due to be replaced by the end of the decade by four new "Dreadnought-class" types, itself reportedly worth more than £30bn...

In France, the debate on the cost of Nuclear deterrence regularly makes the news when multi-year defense budgets are voted, but the consensus remains pretty strong. French Nuclear related expenditure were once estimated at €3bn to €4bn a year, or **around 10-15% of the whole defense budget**, a proportion deemed "stable" by experts. The latest Military Programming Act **LPM 2019-2525 dedicates around €25bn for the nuclear deterrent**, including both airborne and submarine "components". ICAN notices that **France ranks as the 5th largest spending state (with \$4.45bn in 2019)**, behind the United States, China, the UK and Russia. Jean-Marie Colin – expert and spokesperson for ICAN France - highlights the **cost per minute** of this public expenditure: **€8,466 in 2019** and as the "deterrence" part will increase according to the Military Programming Act (LPM), this cost per minute will be **11,415 euros in 2024**. Those figures have to be compared with official estimates given just one year by the Chief of French **Strategic Air Forces (FAS)**, General Mairret to the French Parliament. "The nuclear aggregate accounts for 12.5% of the total defence budget - and this will remain true until 2025." He said. *The cost of deterrence, (...), therefore amounts to €60 euros per citizen and will reach €100 per capita by the end of the 2025.*" he added Recently, France put at sea its latest nuclear attack submarine (a SSN and **not a SSBN**, though), the Suffren, and no later than this week, the French Defense minister – Mrs.Parly – evoked the **Charles de Gaulle aircraft carrier successor, and hinted it would be also nuclear-powered**... Let's recall that the ship carries nuclear-capable Rafale, equipped with the ASMP-A (Air Sol Moyenne Portée – Amélioré) missile, to be replaced at some point by the elusive ASN4G – also built by MBDA...

Meanwhile, the US is about to award **Northrop Grumman GBSB industry team** now including Aerojet Rocketdyne, BRPH, Clark Construction, Collins Aerospace, General Dynamics, Honeywell, L3Harris, Lockheed Martin, Parsons and Textron Systems, with the **\$85bn contract to design and build the Air Force's next-generation intercontinental ballistic missiles** set to replace the venerable Minuteman III ICBMs.

Data for other, more exotic countries are even more difficult to estimate. But ICAN can count on some local correspondents to find the best official and unofficial figures, and better understand the local context. Therefore, this is a good time to review the "Big picture" kindly provided by ICAN analysts, helped by a number of prestigious research institution such as Harvard, the MIT, the Carnegie Endowment for International Peace, the Center for Non-proliferation Studies at Monterey, Harvard University, Sciences Po, the United Nations Institute for Disarmament Research and others

You can download the report here: <https://d3n8a8pro7vhm.cloudfront.net/ican/pages/1549/attachments/original/1589289988/ICAN-Enough-is-Enough-Global-Nuclear-Weapons-Spending-2020-published13052020.pdf?1589289988>



VALUATION

European A&D - engines names price in good growth levels (UBS-2020/05/04)

Last week, UBS analysts shared, their analysis of the European Aerospace and Defense sector at a time where several European nations are just starting to ease their quarantine measures, giving businesses a little more flexibility to resume their operations.

They considered overall **1Q20 results to have been better than forecasted** but nevertheless noticed that April has experienced a slow brake with **restrained OE deliveries (7 for Airbus)**, GE being subject to a **drop of 50% in engine visits and 50% in contractual service agreements**. Other groups are reviewing their strategy such as Delta, whose management decided **to cut maintenance expenses by 80% in 2Q/3Q20** or Meggit, MTU and Safran currently negotiating **cost reduction plans**. Therefore UBS analysts decided to **cut their EBITA estimates "by 15% in FY20, 8% in FY21 and by mi-single digits from 2022"**.

Concerning the volume of aircraft needed for the 2020-2025 timeframe, Celine Fornaro and Florent Dehlinger forecasted **retirements to peak up to 5-6% of in service compares to 2.5-3% in "normal years"**. Authors believes that carriers will have to retire their ageing fleets at a quicker rate once the COVID19 episode comes to an end, especially taking in account the growing awareness from governments and individuals when it comes to carbon emissions. Besides, with the likely rise of jet fuel, carbon offset and other restrictions, they estimate that **with about 5-6% of the global fleet to retire in the coming years, some 1000- 1100 aircraft will be needed**. As of 2023, **about 1400 commercial airliners should be added per annum with Airbus gathering approximately 55% of overall market share**. Up to today they said, *"airlines have globally*

raised (or planned) \$6.9bn of equity on top of loans and government aid”.

About UBS expectations regarding **aftermarket revenue declines**, analysts forecasted they will remain very wide with **a 45-50% drop for 2020 and 10%-15% in FY21**. In their view, **aftermarket revenues will underperform flying hours meaningfully** as scope and pricing are to face headwinds: *until the grounded fleet becomes elevated airlines can promptly use, reduce, return, sell their available components, spare engines etc”.*

Analysts also shared their **stock preference for Airbus (PT €100) and Thales (PT €100)** whose ratings were maintained at a “buy rate” given their valuation compared to future demand rates and product positioning. In parallel, they also underlined that **Safran and MTU’s shares could react positively, on the short term**, to a gradual return of activity on domestic flights while, **earnings momentum could degrade for another 6 months**. Besides analysts see the following Short-term catalysts: **pick-up in domestic travel and OE deliveries to China, more details on cost-cutting plans**.

▲ AND ▼ IN THE A&D SECTOR OVER ONE WEEK

	Δ over 1 week	Thursday closing value
Airbus Group	-7,64%	49,60
BAE Systems	2,96%	505,00
Boeing	-0,30%	121,50
Bombardier	-18,87%	0,43
Dassault Aviation	-1,44%	685,00
Elbit Systems	-1,18%	133,01
Embraer	-13,55%	6,19
General Dynamics	8,03%	131,50
General Electric	-3,18%	5,79
Honeywell	-8,25%	122,07
Huntington Ingalls	-4,70%	170,26
Irkut	20,14%	30,06
L-3 Communications	-2,72%	177,54
Leonardo	-5,00%	5,70
Lockheed Martin	-3,80%	364,18
Northrop Grumman	-0,80%	320,46
Oshkosh Corp.	-5,29%	59,31
Rheinmetall AG	-2,93%	60,88
Rolls Royce	-12,19%	257,90
Raytheon	-7,41%	53,63
Saab AB	-4,98%	200,40
Safran	-3,65%	75,50
Thales	-6,57%	63,66
Textron	-6,74%	23,38
United Technologies	-7,64%	49,60



UNLIKELY LINK

EGYPT / USA: a little closer



Last week, the US State Dept. issued a potential Foreign Military Sale (FMS) for a **Refurbishment contract regarding 43 Boeing AH-64 Apache attack Helicopters** currently in service in the Egyptian Air Force. If approved, **the \$2.3bn package**, would

provide the Egyptian’s Air Force with 88 GE Aviation T700-GE-701D Turboshaft engines, 47 Lockheed Martin Modernized Target Acquisition Designation Sight/ Pilot Night Vision Sensors, 45 BAE System’s Common Missile Warning Systems and 92 Honeywell Embedded Global Positioning System/ Inertial Navigation Systems. According to the release, “Egypt intends to use these refurbished AH-64 helicopters to address the shared US-Egyptian interest in countering terrorist activities emanating from the Sinai Peninsula, which threaten Egyptian and Israeli security and undermine regional stability”. This sale would also “*further enhancing greater interoperability between Egypt, the US, and other allies.*” stated the Defense Security Cooperation Agency.

Although Washington and Cairo have been allies in the long-lasting war against terrorism, with massive military sales, it seems that **the financial, military and political relationship between Washington and Cairo have been subject to up and downs over the past few years**. If on paper, both nations struggle to reflect a cordial liaison, the White House does not fear to put pressure on the North African country, especially when it comes to Human Rights. As noticed by the Wall Street Journal, Egypt is known to be the country detaining the most US citizens in prison (14 in 2019), often in harsh conditions without consideration for basic rights. **Bilateral relations clearly deteriorated under Obama’s mandate**, the Trump Administration closely follows General Al Sisi’s actions and did not hesitate **to cut in the annual \$1.3bn budget** normally dedicated to assist Cairo in its military modernization, or to wave diplomatic and financial sanctions, especially when the regime reinforces talks with North Korea or when it considers buying Russian made Su-35s... So the latest FMS sale for the Egyptian Air Force probably means **that the bilateral relation has slightly improved lately**.

Over the past decades, the US has often relied on its Egyptian partner as a vector of stability in the MENA region. Since the Camp David accords were signed with Israel in 1979, Cairo had benefited from a gradual assistance from the White House which provided the North-African country with approximately \$40bn and \$30bn respectively in military and civil support over the years. Bilateral economic relations were also empowered since the 2000s, the trade balance in 2018 was established at \$7.5bn. Exports to Egypt include wheat and corn, mineral

fuel and oil, machinery, aircraft, and iron and steel products. U.S. imports from Egypt include apparel, natural gas and oil, fertilizers, textiles, and agricultural products. Washington and Cairo agreed to sign, in 1982, a bilateral treaty to facilitate bilateral investments and cash movements. American firms are active in many sectors of the Egyptian economy, including oil and gas exploration and production, financial services, manufacturing, construction, telecommunications and information technology, as well as in tourism with direct investments in Egypt amounting to about \$21bn in 2018.



AT-A-GLANCE

CIVIL AVIATION

- ▶ **USA:** After announcing the early withdrawal of its fleet of MD-88 and MD-90 as early as June, Delta decided to retire its 18 Boeing 777 by the end of the year, allowing it to adapt its capabilities to a demand it expects to be lower due to the global health crisis. The aircraft have been in service between 10 and 21 years, and the company believes their depreciation cost prohibitive.
- ▶ **USA:** IATA forecasts global air travel could lag previous expectations for another 5 years. Air Traffic next year will be down 33%-40% from projections made prior to the COVID-19 pandemic, according to the agency, which does not expect travel will recover to last year's levels until 2023 at the earliest.
- ▶ **USA:** Boeing expects to start production of grounded 737 MAX jet this month. *"I am confident we will start our line this month on the MAX again,"* Calhoun told Fox Business. The group delivered six aircraft in April, bringing its deliveries in the first four months of the year to 56, a 67% slide from the January-April period last year.
- ▶ **MEXICO:** According to Reuters, French engine manufacturer Safran is about to lay-off 3,000 employees in Mexico, due to the severe decline in demand caused by the Covid-19 crisis. With around 13,000 employees in the country, the French aeronautical equipment manufacturer notably has two production sites in Querétaro, an industrial city in central Mexico.
- ▶ **COLOMBIA:** Avianca Holdings is rejecting 14 aircraft on operating lease as it files for Chapter 11 bankruptcy protection in a New York court. The Colombian flag carrier says 14 jets on lease from AerCap, GECAS, GOAL, Orix Aviation and an ABS managed by Zephyrus Aviation Capital are "excess aircraft" and are no longer required under the airline's business plan. Avianca was about to take delivery of 88 Airbus A320neo's.
- ▶ **BRAZIL:** In anticipation of the failed deal between Embraer and Boeing and the extensive preparations that were made in advance of an expected merger, Embraer only delivered 5 aircraft -- one E190-E2, one E195-E2 and three E175s -- during Q1. As of March 31, the firm order backlog totaled U\$15.9bn. Factors contributing to the low sales include a weeklong shutdown of the final assembly line and the hesitation of most customers to make a purchase before a deal was finalized. Although 85% of the Embraer is in the hands of various foreign funds, the group remains tightly linked to the Brazilian State. As regards commercial aviation, credit-lines from BNDES totaling R\$49bn were forthcoming between 2004 and 2018, aiding in the sale of around 30% of planes placed during that period, local business daily Valor reports. According to analysts, due to Boeing decision, Embraer now faces three choices: it can begin a new search for an alternative joint venture, it can expand into manufacturing larger jets or it can increase its investment in smaller aircraft, in the hope of a rise in demand as the pandemic subsides. The latest issue appears to be a strategy favoured by the company, which said it is confident its workhorse jets, such as the E170 and E190, will "lead the rebound in the aviation industry in the upcoming quarters as airlines resume their operations through regional and domestic routes". "Naturally, large aircraft will take longer to return to full operation, and small aircraft will have more possibilities. As there is this drop in demand, perhaps airlines will decide to place Embraer aircraft on routes because they are more efficient and have less seating," Thiago Nykiel, partner at aviation consultancy Infraway? TOLD the *Financial Times*.
- ▶ **BRAZIL:** Gol Linhas Aeras Inteligentes (GOL) says it will receive \$412mn from Boeing as compensation for the grounding of 737 Max planes. Gol, Brazil's largest airline, is one of Boeing's biggest customers and had ordered more than 100 737 MAX jets; the orders have since been reduced, and Gol says it will not make new aircraft payments to Boeing for the next two years.
- ▶ **ARGENTINA:** The Argentine government has announced the upcoming merger of the state-owned airlines Aerolineas Argentinas and Austral Lineas Aereas in the hope of improving their chances of surviving the pandemic.
- ▶ **AUSTRALIA:** Following the call to pause 12 Airbus A350XWB deliveries, Australian carrier Qantas Airways now delays the remaining orders. The airline does not expect aircraft deliveries from Boeing and Airbus anytime soon, a Qantas spokesman confirmed to Executive Traveler.
- ▶ **JAPAN:** Mitsubishi Aircraft's parent company will review the development of a 76-seater variant of its regional jet program nearly a year after its launch, as full-year losses related to the project widened. Mitsubishi Heavy Industries (MHI) will also halve the budget allocated for the SpaceJet regional aircraft program to \$558mn for the year ending 31 March 2021.
- ▶ **JAPAN:** Bain Capital Private Equity today announced that it has completed a majority investment in Showa Aircraft Industry. Bain

Capital now fully owns the business and Showa Aircraft Industry has been delisted from the Second Section of the Tokyo Stock Exchange. The total consideration of the transaction was approximately \$817mn.

- ▶ **SINGAPORE:** Singapore-based lessor BOC Aviation has signed a purchase-and-leaseback agreement with US low-cost carrier Southwest Airlines for 10 Boeing 737 Max 8 aircraft.
- ▶ **QATAR:** Qatar airways is in talks with Airbus and Boeing to defer aircraft orders for several years, its chief executive was quoted as saying on Wednesday. The report did not say how many aircraft the airline was looking to defer or for exactly how long. Qatar Airways has over 200 Airbus and Boeing aircraft on order.
- ▶ **ISRAEL:** Israel's government will grant El Al Airlines loan guarantees for 80% of a \$400mn loan to help it survive the COVID-19 crisis on condition that the nation's flag-carrier lays off a third of its 6,000-strong workforce as part of a restructuring. The Times of Israel reported that the loan is conditioned on the owners injecting \$28mn into the company and carrying out further restructuring to reduce annual costs by at least \$50mn.
- ▶ **RUSSIA:** On April 15, just short of a full 12 months after the crash landing of Aeroflot's Superjet-100 flight 1492 at Moscow's Sheremetyevo airport, Russia's prosecutor office has announced the completion of its investigation into the cause of the accident and that it has found captain Denis Yevdokimov guilty of inadequate actions that led to the deaths of 41 people. The pilot is facing the prospect of 7 years in prison but has pleaded not guilty. The captain believes it was the faulty Superjet 100 design that had an impact on aircraft performance and safety.
- ▶ **HUNGARY:** While most airlines are cancelling aircraft orders and deferring deliveries, Budapest-based budget airline Wizz Air, which will soon launch in Abu Dhabi, is proceeding with 22 Airbus deliveries over the next 14 months. CEO József Váradi told Aviation Business that Wizz Air's fleet, which consists of A320s and A321s, will grow from 121 aircraft to around 135 by June 2021, after it has returned some of its older jets.
- ▶ **UK:** International Airlines Group (IAG), the parent group of British Airways, Iberia, Aer Lingus and two low-cost brands LEVEL and Vueling, is no exception to the difficult situation surrounding the industry. The group, however, is still keen to complete its purchase of Air Europa. Back in 2019, the price was set to be €1bn in cash, as the airline group aimed to create a rival hub to the top four European airports, namely Amsterdam Schiphol Frankfurt Airport London Heathrow and Paris's Charles De Gaulle. The company was hoping to complete the purchase by H2 2020, subject to regulatory approval.
- ▶ **GERMANY:** Lufthansa Group is to double the number of aircraft in service to 160 from the beginning of June as it starts to re-open its

SPEAKERS' CORNER

"In a way we were lucky. On paper, the other offerings might have been great, but we are operational" said Fincantieri CEO **Giuseppe Bono**, to explain how he successfully managed to sell his frigate design to the U.S. Navy against domestic competitors. (*Defense News – 2020/05/04*)

"A merger is not on the agenda" replied **Eric Trappier**, head of Dassault Aviation asked on May 6 about the possibility of a tie-up between Safran and Thales. *"There is no plan for consolidation. As a shareholder, we do not call for such a link-up, neither in today's environment nor in the previous one."* he added (*Aviation Week – 2020/05/12*)

"It's unimplementable and unenforceable anyway, so I think people will largely ignore it, which is not good," Ryanair CEO **Michael O'Leary** told BBC television on Tuesday, predicting that have arriving passengers self-isolate in their accommodation for 14 days upon arrival was *"idiotic"* and would "disappear pretty quickly". (*Reuters – 2020/05/12*)

"Air traffic levels will not be back to 100% by September. They won't even be back to 25%, Maybe by the end of the year we approach 50%." Boeing CEO **Dave Calhoun** said in an interview Asked by Today show host Savannah Guthrie if a major airline might have to fold, Calhoun replied, *"Yes, most likely."* (*NBC - 2020/05/12*)

"If we see a buying opportunity, we're not going to be shy. We're not going to be stupid either, though. We'll do what makes sense for the long-term prospects of the business." said **Greg Hayes**, CEO of Raytheon Technologies, regarding possible acquisition amid the coronavirus crisis (*Jane's Fence Industry – 2020/05/13*)

100.000: such is the number jobs threatened by the pandemic side-effects in the German aerospace sector according to the industry association BDLI (*Stuttgarter Zeitung – 2020/05/06*)

+43%: such would be the air fare hike in the Middle East if social distancing enforced on planes, as it would incur additional costs for airlines (*IATA - 2020/05/06*)

-45%: such is the salary cut for the next two years proposed by Lufthansa pilots union Vereinigung Cockpit in exchange of a freezing in lay-offs over the same period (*The Travelers Club – 2020/05/05*)

-108: Such is the number of 737 MAX orders lost by Boeing just last month, bringing its order book below 5,000 for the first time in 7 years. (*AviationMe – 2020/05/13*)

£5mn: such is the reward offered by Stelios Haji-Ioannou, founder and main shareholder of EasyJet for *"any information that would lead to the cancellation of an order"* for 107 Airbus A320neo's valued at £4.5bn previously agreed by the board he now judges cumbersome and dangerous for the company. (*Sky News – 2020/05/12*)

network. The company says that passengers will be able to access over 100 destinations. It states that the repatriation schedule, which has involved 80 aircraft, is set to end on 31 May, and Lufthansa plans to re-introduce services to leisure destinations including Mallorca, Sylt, Rostock and Crete.

- ▶ GERMANY: The country's aerospace industry sees itself in its worst crisis due to the coronavirus pandemic and calls for extensive aid from the government, news agency Reuters has reported. Over 100,000 high-tech jobs in Germany are in danger, the German Aerospace Industries Association (BDLI) announced on Tuesday. Meanwhile, the BDLI grouped with its French counterpart GIFAS to ask for a concerted Franco-German rescue package
- ▶ IRELAND: Ryanair plans to move back to an all-Boeing fleet by cancelling leases for Airbus A320s for its Lauda subsidiary and likely replacing 30 Airbus jets at the Austrian airline with Boeing 737s. "Until they need an order from the Ryanair Group, frankly we are wasting our time talking to Airbus," CEO Michael O'Leary added, without elaborating.
- ▶ EUROPE: EU airlines and travel companies should give people vouchers valid for 12 months for contracts cancelled due to the pandemic, the European Commission is planning to recommend Wednesday, according to a draft paper seen by Reuters. Vouchers should be "the same type of services or of equivalent quality as the terminated package" or be changeable for a "full refund," it said. National governments should also guarantee them in case of bankruptcies.
- ▶ EUROPE: Building on reports from Bloomberg, Reuters says Airbus is weighing restructuring plans involving the possibility of "deep" job cuts, though a decision won't likely be made before the summer. CEO Guillaume Faury is expected to update managers on details today after warning staff last month that the firm's survival was at stake due to a slump in demand from COVID-19.

BUSINESS AVIATION

- ▶ CANADA: Bombardier, which suspended its 2020 guidance in March, said last week it will ramp up production of its flagship Global 7500 corporate jets. The company did not provide a new forecast for corporate aircraft deliveries but Chief Executive Eric Martel said during a media call said he expects Bombardier to deliver "a few less" of the 35 to 40 Global 7500 jets originally planned for 2020 and will continue its ramp-up of the \$73mn plane. The company expects to increase local production in May as the province of Quebec slowly reopens its economy. For Q1, Bombardier which is reducing production rates 30% to 35% y/y announced 26 bizjet deliveries vs. 24 last year.

- ▶ CANADA: Jetflite received a new Challenger 650 initially configured for executive charter service in late March and quickly adapt the 12- to 16-passenger VIP aircraft for air ambulance use to work in Covid-19 relief missions, including one tour of patient repatriation flights. The Finnish charter and management firm Jetflite said that within 14 days of delivery, the Challenger had completed 100 hours of flight that included the repatriation of dozens of patients affected by Covid-19. During one of the tours, the Challenger 650 traveled across three continents in five days, the company said.
- ▶ USA: On May 11th, Gulfstream announced the G600 earned type certification from EASA, enabling deliveries to EU customers. FAA certification was received in June last year. The jet which can carry passengers 5,500nm nonstop - enough range to travel from London to Los Angeles or from Paris to Hong Kong, entered service in Q3 2019 with 9 aircraft delivered to date. European customers accounted for 12% of 2019 Gulfstream deliveries.
- ▶ USA: Gulfstream also announced this week that 3 of its planned 5 flight-test aircraft G700s are now in operation with the flight last Friday of the third test aircraft—registered as N703GA. The plane dubbed T3 by Gulfstream made a flight of approximately from the company's headquarters at Savannah/Hilton Head International Airport and reached 45,000ft and Mach 0.85 during the flight. The three first test aircraft have now logged more than 100 flight hours to date and G700's envelope has been expanded to 54,000ft and Mach 0.94, the company said. The current timeline for the G700 saw a launch in October 2019, with a potential EIS in early 2022 or under three years.
- ▶ USA: according to the investment bank Jefferies: "Biz Jet Deliveries finally advanced in FY19 (+11%) after years of head fakes. FY20 was on target, but given COVID-19 related disruptions we now est. deliveries fall 40% in 2020. Recent growth has largely been new product driven, which should be curtailed in the near term. Questions facing biz jet manufacturers and the supply base include: 1) Order activity and pipeline trends since COVID-19 disruptions; 2) Regional areas of weakness; 3) productivity at lower production levels. Longer-term question is in a post COVID-19 world do biz jets actually benefit with executives and individuals choosing a less congested way to travel".
- ▶ USA: U.S. air-safety regulators are proposing mandatory inspections and fixes, if necessary, covering some 6,500 propeller-powered Cessna planes prone to corrosion that could result in hazardous damage to their tails.
- ▶ BRAZIL: In the first quarter of 2020, Embraer delivered a total 9 executive jets (five Phenom 300Es and four including —one Praetor 500 and three Praetor 600s), said the company its first-quarter 2020 delivery report. As of March 31st, the firm order backlog totaled USD 15.9 bn. During the period the Brazilian

airframer announced the FAA, ANACE and EASA certification of its Phenom 300E.

- ▶ UAE: according to Aviation Business ME, Dubai-based private jet charter Jetex is on the lookout for acquisitions as its CEO, Adel Mardini, positions the company for what he predicts to be exponential growth in the business aviation market once travel and airport restrictions lift. People used to flying first and business class commercially will start using private jets instead over the next 18 months, Adel Mardini told Aviation Business ME, adding that he was expecting business to start to improve by July. *“Last month we had 10% of the business we had in April 2019 because of the restrictions. For the first 10 days in May, we had the same amount of business as we had over the whole of April,”* Mardini told Aviation Business ME. *“We expect massive demand the minute they lift airport restrictions. I can assure you that business aviation will be booming. I expect massive growth in this industry until commercial airlines are stable and a vaccination is found.”*
- ▶ UK: TailHail, a UK-based aviation disruptor developed by British entrepreneur James Moon, describing itself as the first membership-based private jet platform outside the US, says it offers private aircraft operators the opportunity to increase flight hours on their jets – as charter flights are becoming increasingly popular options in the midst of the Covid-19 crisis, which has caused most commercial aircraft operators to ground their services. Moon says his new platform also offers aircraft operators of private jets the opportunity to increase their flight hours from the aircraft that they manage and to reduce their exposure to the costly business of empty or under occupied flights.

MILITARY AVIATION

- ▶ USA: The Air Force is moving toward finishing closeout negotiations for the canceled Hypersonic Conventional Strike Weapon and performing a new flight test of the Air-Launched Rapid Response Weapon this summer. USAF spokesman confirmed to Inside Defense the service and HCSW developer Lockheed Martin will finalize discussions to complete a \$928mn contract awarded to the company in April 2018 at the end of the fourth quarter of FY2020.
- ▶ USA: Jane's Defence Industry reports that Kratos Defense & Security Solutions has acquired last February Technical Directions Inc (TDI), an American firm that makes small engines for cruise missiles and unmanned aircraft. for \$10.5mn in cash.
- ▶ USA: GKN Aerospace has signed a strategic agreement with Boeing to solidify a continued working partnership covering the production of structural components and assemblies for several types - F/A-18E/F Super Hornet, F-15E Strike Eagle and C-17 Globemaster III - until 2023.

...MEANWHILE...

PHYSICISTS TO DEMONSTRATE QUANTUM RADAR PROTOTYPE

Last week, *ScienceAdvances* revealed that physicists from the Institute of Science and Technology Austria (IST Austria) along with collaborators from the Massachusetts Institute of Technology (MIT) and the University of York, UK, as well as the University of Camerino, Italy, have invented a new radar prototype that uses quantum entanglement as a method of object detection in environments with bright thermal noise. Instead of using conventional microwaves, the prototype dubbed “Quantum radar”, scientist decided to use photons. Whereas classical radar system often fail in environments with low signal powers, “Quantum radar” could be particularly useful in noninvasive biomedical scanning or low-power short-range radar. According to Professor Johannes Fink, the group leader, the team will need the help of experienced electrical engineers in the future to demonstrate an advantage in practical situations.

CHINA TO LAUNCH AN E-SHOP FOR SATELLITES

On May 14, Global Times revealed that China Aerospace Science and Technology Corporation (CASC) has launched a commercial satellite-shopping platform called “Lizheng Satellite Shopping Mall” on WeChat. Through this platform, perfectly similar to usual Chinese e-commerce platforms such as Taobao, any customer (from China or abroad) can pick its favorite satellite and add it to its cart. The satellites for sale on the e-commerce platform range from 50 to 300kg and ground measurement is available via a 12m or a 7.3m antenna ground station. These satellites could have several applications such as communication, infrared remote sensing as well as agricultural and emergency respond. According to a CASC insider interviewed by Global Times, the new platform would currently only display key technological specifications online, without naming the price.

AIRBUS SNIFFER AIRPLANES

No, Airbus is not involved in another typically French political and financial scandal such as the famous 1979 hoax. Since 2017, scientists have been working on the design of sensors dubbed “smell cameras” able to track down explosives. As the sensors use tiny processors made of biological cells to identify specific chemicals or microbes floating in the air, Airbus would plan to make the sensors able to track sniff out coronavirus. The explosive-detecting variant of the device might be tested by the end of the year at airports, with the virus-detecting variant placed aboard plans themselves later on.

- ▶ USA: the United States Air Force has awarded StandardAero a \$237mn multi-year contract to provide engine maintenance, repair and overhaul (MRO) services for General Electric J85 turbojet engines powering the USAFT-38 trainer jet
- ▶ USA: Sierra Nevada said on May 11 that it will deliver a third Embraer A-29 to U.S. Special Operations Command to support the Combat Aviation Advisor mission. The additional aircraft was added under the previously awarded, undefinitized contract for \$129mn for two A-29s awarded to Sierra Nevada on Feb. 26.
- ▶ USA: The Air Force will shortly launch its effort to buy Skyborg drone prototypes, according to the official running the unmanned wingman program. The service will begin soliciting aircraft this month and plans to award contracts to the winning designs by the end of the summer, Advanced Aircraft Program Executive Officer Col. Dale White told Air Force Magazine. Chosen drones will then head into experiments to show off what they can do. White did not say how many airframes the service plans to buy, Kratos? Boeing General and Lockheed martin are expected to bid.
- ▶ CHINA: Jane's reports that a new naval variant of the Guizhou Aviation Industry Corporation (GAIC) JL-9 Shanying ('Mountain Eagle') advanced two-seat, single-engined aircraft jet trainer (AJT) conducted its first flight on 12 May.
- ▶ INDIA: according to the newspaper News Bharati, state-owned company Hindustan Aeronautics Limited (HAL) has submitted a proposal to the Ministry of Defense for the supply of an additional order for the assembly of another 72 Su-30MKI licensed at a cost of approximately \$ 5bn (approximately \$ 70mn per aircraft).
- ▶ QATAR: Boeing awarded a contract to deliver 53 Harpoon Block II anti ship missiles and support equipments to Qatar, as part of weapon package for Qatar Emiri Air Forces F-15QA
- ▶ RUSSIA: Russia has tested a new hypersonic missile designed to arm its modified Tu-22M3M strategic bomber aircraft. "Recently, a new hypersonic missile was tested on the Tu-22M3. The missile will be part of the armament range of the upgraded Tu-22M3M along with a number of other latest aviation weapons," a source was quoted as saying by TASS on Monday. Russia plans to complete tests of the missile and bomber-upgrade together. Work on the new missile reportedly began several years ago.
- ▶ RUSSIA: State testing of the Sukhoi Su-57 fifth generation jet fighters has entered their final stage, Russian Deputy Prime Minister Yury Borisov said in an interview with Interfax. The Russian Defense Ministry expects to receive 76 Su-57 fighters equipped with air-to-air and air-to-surface guided weapons by 2028.
- ▶ RUSSIA: Yakovlev Design Bureau recently began work on an attack aircraft based on the Yak-130, learned BulgarianMilitary.com citing news agency politros. According to the company sources the new attack aircraft will seriously compete with the improved American F-16. In terms of a number of characteristics, the new aircraft surpasses its American counterpart, as it weighs half as much and costs 3.5 times less.
- ▶ TURKEY: Defence Industry Director Ismail Demir said on Thursday it is still producing and delivering parts for U.S. F-35 jets despite being suspended from the program nearly a year ago over its purchase of a Russian anti-aircraft defense system S400,. ems. "There was an understanding in the United States that nothing would be bought from Turkey for the F-35s after March 2020, but that approach is no longer there," Demir said. He suggested the global coronavirus pandemic meant the March deadline no longer applied, without elaborating. Taking Turkey out of the project would cost other members of the program up to \$600min, he added.
- ▶ FINLAND: Jane's reports that Helsinki has released a joint request for information (RfI) as part of a market mapping exercise for Category I vertical take-off and landing (VTOL) unmanned aerial vehicles, aimed at improving ISTAR capabilities for small units up to company size", and involving the country's Army, Navy and Air Force.
- ▶ FINLAND: according to local press reports quoting informed anonymous sources, the former chief of the Armed forces has actively lobbied in favor of the F-35 Lightning II in spite of the fact that he was still in duty.if confirmed, these revelations could delay the HX competition, in the context of budgetary pressures due to the coronavirus outbreak.
- ▶ SWITZERLAND: Due to the difficult global situation linked to the Covid-19 pandemic, the second round of offers for combat aircraft and long-range surface-to-air defence systems is expected in November 2020. In setting this new deadline, the DDPS responds to the fact that manufacturers are also affected by measures such as restricting travel or encouraging telework, and that conducting face-to-face interviews is not possible. This new schedule has no impact on the future of the acquisition process.
- ▶ GERMANY/SPAIN/France: On May 8, the chiefs of staff of the French, Spanish and German air forces, met by videoconference to discuss the advancement of the Future Air Combat System (FCAS), The commitment of the three chiefs of staff of these allied air forces aims to respect the ambition of a first flight of the New Generation Fighter (NGF) demonstrator by 2026, the French air force said in a release
- ▶ FRANCE : according to the chief of French defense acquisitions, Joel Barre, hopes that the discussion concerning the Eurodrone between France Germany and Italy be completed in the coming weeks, "so that we can converge on the conditions for the

implementation of the program before the summer". He also confirmed that Thales' delay in the production of the Talios ISR and Laser designation Pod was being resolved: "the first Talios are in operation in the Air Force and the Navy; a dozen more will be delivered this year", he said

HELICOPTERS

- ▶ USA: The US Army is to start receiving the Version 6 hardware and software update for the Boeing AH-64E Apache attack helicopter in August. Boeing says it has already delivered the update to one international customer, though it declines to name the nation. The update improves the AH-64E's maritime and unmanned air vehicle (UAV) targeting abilities, among other enhancements.
- ▶ USA: Boeing expects it will secure two more new customers for its AH-64 Apache attack helicopter over the next 12-14 months. Boeing is bullish about the rotorcraft's prospects in up to 10 international campaigns that are making their way through the Foreign Military Sales process, Terry Jamieson, Boeing's Vertical Lift International global sales and marketing manager, told journalists on May 12.
- ▶ USA: The Bell 360 Invictus helicopter is one of two aircraft designs competing for a U.S. Army contract, but it does not meet a critical requirement for one of the planned major operators, a Special Operations Command (SOCOM) acquisition official said on May 12. SOCOM needs the FARA aircraft to carry at least four to six troops internally in addition to the flight crew, said Geoffrey Downer, SOCOM's program executive officer for Rotary Wing aircraft. The Sikorsky Raider X is designed to meet the SOCOM requirement, but the Bell 360 is not, Downer said.
- ▶ USA: The U.S. Government Accountability Office (GAO) has denied Airbus' formal protest over the U.S. Navy's decision to select Leonardo to provide its new training helicopter. The nonpartisan agency has not released a report explaining the decision, but posted the denial on its docket May 12. The company's U.S.-based rotary-wing business filed the complaint Feb. 3 over Naval Air System Command's decision to select Leonardo.
- ▶ JAPAN: The first Bell-Boeing V-22B Osprey tilt rotors ordered by Japan have arrived in their home country late last week as the nation continues to build up its amphibious capabilities.
- ▶ PHILIPPINES: Defense Secretary Delfin Lorenzana said the attack helicopters being offered by Boeing (AH-64E Apache) and Bell (AH-1Z Viper) are way out of budget, as the Philippine government's has allocated only P13bn for acquisition, *The Inquirer* reports. The offers came despite the Philippine Air Force's selection of T129 ATAK helicopters of the Turkish Aerospace Industries (TAI). The Turkish supplier, however, is still trying to

obtain an export license from the US government for subsystems, the *Inquirer* adds

- ▶ EGYPT: The US State Department has approved a possible Foreign Military Sale of a refurbishment package for 43 Boeing AH-64E Apache attack helicopters owned by Egypt. The estimated \$2.3 bn deal is not final, but was announced through a required notification by the Defense Security Cooperation Agency to the US Congress on May 7.
- ▶ UK: Bristow Group and Era Group recently announced the new global organization structure and the selection of the executive leadership team that will help create a financially stronger industry leader in offshore helicopter transportation and search-and-rescue services. The structure and executive appointments will be effective upon the close of the transaction and approval by the board of directors, currently scheduled for mid-June 2020.

UNMANNED AERIAL SYSTEMS

- ▶ USA: Republicans on the House Judiciary Committee required answers from the Department of Justice and Department of Homeland Security regarding the supply of approximately 100 drones by Chinese-based manufacturer DJI to 43 agencies in 22 states around the country. Mainly used by police forces to monitor citizens who wouldn't respect social distancing measures, congressmen Jim Jordan and Matt Gaetz, fear the technologies used by such gadgets could pose a threat to national security. As early as 2017, the Department of Homeland Security already warned that DJI was "selectively targeting government and privately-owned entities within specific sectors to expand its ability to collect and exploit sensitive U.S. data."
- ▶ USA: Texan Railroad Commission recently launched a fleet of 8 drones to conduct surveillance missions of oil field equipment's strewn across the state. Monitored by 19 inspectors, that have been recently certified by the FAA, Railroad Commission Executive Director Wei Wang disclosed that "With drones, our inspectors can now immediately monitor well blowouts, oil spills, and other emergency incidents, and quickly cover large areas of ground in responding to those situations where time is of the essence".
- ▶ USA: The FAA has been strengthening legislation over the use of private UAVs in collaboration with 8 vendors (Airbus, Airmap, Amazon, One Sky, Skyward, T-Mobile, Wing and Intel) who agreed to equip their drones with a unique ID code and tracker. Often used for home deliveries or other transportation services, gadgets shall be able, in the short term to transmit their location whilst on duty. Manufacturers have 2 years to implement the

technology, older non-equipped drones would have to be phased out within 3 years.

- ▶ **BRAZIL:** Mac Jee who is the prime supplier of rocket launcher for the Brazilian Air Force recently disclosed it has acquired Equipaer, producer of the Spanish DIANA version drone in the country for an undisclosed amount.
- ▶ **JAPAN:** The MoD recently disclosed that the number of illegal drone flights soared to records heights in 2019. About 111 cases of drone flights would have flouted the law past year, especially by flying their gadgets over restricted zones without permission. Non-Japanese citizens arrested for such use accounted for 44.3% of them.
- ▶ **INDIA:** The Ministry of Civil Aviation (MoCA) has granted exemptions to 13 consortia to operate drones on an experimental basis, without the need for unique identification numbers and operator permits until September 30th.
- ▶ **UAE:** Acciona, a major supplier of sustainable infrastructure solutions and renewable energy projects, said it has begun using drones during the tunnel construction phase to obtain a regular digital record of the works to analyze real-time data. This technology, which can be used on tunnel projects excavated by conventional methods (explosives, hammers or cutters) as well as on underground mining programs, can be supplemented with photographic resources to regularly monitor a project, said the statement from Acciona.
- ▶ **ISRAEL:** Elbit Systems has introduced a unique life-saving capability to its Hermes 900 Maritime Patrol Unmanned Aircraft System (UAS). "Integrating detection and identification capabilities, onboard inflated life-rafts, and precision dispatch capability, enables the UAS to perform long-range maritime Search and Rescue (SaR) missions" disclosed the group.
- ▶ **ISRAEL:** Israel will lease the Heron unmanned aerial vehicle (UAV) system to Greece for a three-year period, following a deal between the two countries' MoDs. The almost €40mn agreement that was signed digitally due to the pandemic on May 6, is the first that has been negotiated for over two years. It foresees the UAVs will be delivered within the next six months, and will be used primarily for border Defense. Once the three-year period ends, Greece will have the option to buy the system made by IAI.
- ▶ **GERMANY:** Berlin has reopened a controversial debate over whether its armed forces should be trusted to operate armed drones. While an agreement seems far off, the debate could soon get a European twist. A first step was made earlier this week on Monday (11 May), with the defense ministry inviting experts, representatives of civil society and members of parliamentary groups in the Bundestag to a public hearing on what it said was meant to be an "open debate on potential armament".

- ▶ **IRELAND:** An Irish pub is using a drone to deliver drinks to locals during the COVID pandemic. According to the news outlet, the drone will carry bottles or cans of beer, wine and occasionally even a bag of chips dangling from a string. While other establishments in the area have started making home deliveries with vans (with some even installing kegs in the vehicles), McKeever's is flying their product directly to the customers.
- ▶ **FRANCE:** La Quadrature du Net and La Ligue des droits de l'Homme have filed, several weeks ago, an appeal to the courts to demand the immediate removal of the drones used by the Parisian Police to monitor citizens during the quarantine phase. The associations believed that the devices violated the right to privacy and the protection of personal data. The administrative judge finally rejected their appeal.

LAND & GROUND-BASED SYSTEMS

- ▶ **CANADA:** Canadian army will receive the new sniper rifle C20 in a 7.62mm caliber produced by Colt Canada to replace the C8 used by the sniper teams.
- ▶ **USA:** The Air Force announced today it has selected Northrop Grumman, Lockheed Martin and Australian firm CEA Technologies to demonstrate radar prototypes under its Three-Dimensional Expeditionary Long-Range Radar program.
- ▶ **USA:** Raytheon/Lockheed Martin Javelin JV was awarded a \$121mn modification to contract for the Javelin weapon system. Work will be performed in Tucson, Arizona, with an estimated completion date of Aug. 31, 2023.
- ▶ **USA:** CACI International Inc announced on 12 May that it has been awarded a five-year single-award task order, with a ceiling value of more than \$465mn, by the U.S. Army Combat Capabilities Development Command's (CCDC) Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) center to provide R&D on cryptographic modernization, information security, and tactical network protection.
- ▶ **USA:** Chemring Sensors and Electronic Systems Inc. was awarded a \$200mn modification to contract to develop, integrate and produce and deliver Husky Mounted Detection System kits, spare parts, maintenance and training.
- ▶ **VIETNAM:** Some of the Vietnam People's Army (VPA) T-90S/SK main battle tanks (MBTs) acquired from Russia have been equipped with the Shtora-1 active protection system (APS), according to Janes.
- ▶ **KAZAKHSTAN:** Vehicle manufacturer KPE announced on 13 May that it had signed a further agreement with the MoD for a further

batch of 4x4 Arlan MRAP vehicles. Details and numbers of the contract were not disclosed, but the new batch is to be delivered in 2021, according to Jane's. The vehicle can carry up to 10 personnel, and is based on the design of South African firm Paramount Group's Marauder MRAP vehicle.

- ▶ UAE: The US State Department has made a determination approving a possible FMS to the Government of the UAE of Excess Defense Articles (EDA) of up to 4,569 MRAP vehicles for an estimated cost of \$556mn. The contract expected consists of a mix of MaxxPro, Caiman Multi-Terrain Vehicles, and MRAP All-Terrain Vehicles (MATV), and other related elements of logistical and program support.
- ▶ ISRAEL: Israel Aerospace Industries (IAI) announced on 7 May that it is in the process of acquiring the manufacturing operations of Zibar, Zmag and ZD vehicles from Ido Cohen. The off-road vehicles will be upgraded and adapted for military and homeland defence applications.
- ▶ ISRAEL: Plasan has delivered to undisclosed customer a batch of SandCat 4x4 protected vehicles configured as Spear 120mm self-propelled mortar carrier, according to Army Recognition.
- ▶ TURKEY: According to a local newspaper, the chairman of the Defense Industry Presidency (SSB), announced on 8 May that the deliveries are close for the short-range Portable Air Defense Missile System Project (PorSav) that is carried out in cooperation with ASELSAN and Roketsan, to replace aged Stinger Manpads.
- ▶ TURKEY: President of SSB recently stated that the engine problem faced by the Altay (indigenous Main Battle Tank) is now about to be solved, and an agreement was signed allowing the work to be done with a foreign country.
- ▶ POLAND: The Armament Inspectorate of the MoD announced that it has launched a tendering procedure concerning semi-trailer-based main battle tank/armored vehicle transporters. The process may concern more than 100 vehicles, Defence24 reports.
- ▶ NORWAY: Kongsberg Defence & Aerospace AS has been selected by BAE Systems, Inc. to design and manufacture up to 150 remote Medium Caliber Turret (MCT) for the United States Marine Corps' Amphibious Combat Vehicle (ACV) -30 program. Test article delivery will commence in early 2021.
- ▶ SPAIN: MoD has signed a new commitment allowing the incorporation of a limited company made up of four other national defense industry leaders, and Indra Sistemas, Santa Barbara Sistemas, Sapa Placencia and Escribano Mechanical & Engineering will work together to carry out the VCR 8x8 program. This move means that the contract for the program could be signed in Q3 of FY2020, according to a 13 May defence ministry statement.

- ▶ UK: Meggitt Training Systems has been awarded a \$78mn contract to design and equip a multimission indoor and outdoor training facility in an unspecified Middle Eastern country, the company has announced.
- ▶ GERMANY / FRANCE: according to French weapon acquisition chief Joel Barre a notification of the first contract for the study of the MGCS system architecture is expected "in the next few days". This contract, worth €30mn and due to last 18 months, is equally shared between the French and German industry, as per previous bilateral arrangement.

NAVAL SYSTEMS

- ▶ USA: Textron Systems will work on the Navy's Unmanned Influence Sweep System and Unmanned Surface Vehicle program under a \$20.7 million modification to a 2014 contract. The sweep system comprises a mine countermeasure unmanned surface vessel that serves as part of the littoral combat ship mine countermeasure package
- ▶ USA: The U.S. Navy has awarded Boeing a combined \$3.1 bn in contracts for Harpoon and Standoff Land Attack Missile Expanded Response (SLAM ER) weapon systems in support of Foreign Military Sales (FMS) to several countries including Brazil, Qatar, Saudi Arabia, Thailand, Japan, the Netherlands, India and South Korea..
- ▶ AUSTRALIA: Safran Electronics subcontracted Acacia Systems and Thomas Global Systems for the design of the key subsystems aboard the future Attack-class submarines of the Royal Australian Navy. They will provide Optronics Search and Attack, Navigation Radar and Navigation Data Distribution systems.
- ▶ CHINA: Hu Wenming, the former chairman and Party chief of China Shipbuilding Industry Corporation (CSIC), is under investigation for "suspected serious violations of discipline and law," according to Chinese anti-corruption investigators. The term is typically used in cases of suspected corrupt practices. Hu is the third high-ranking official at CSIC to face a corruption investigation in recent years.
- ▶ SPAIN: Spain has officially joined the PESCO European Patrol Corvette (EPC) project, becoming the 4th EU Member State to join the project after Italy, France, and Greece. Decisions on the allocation of European funds will be taken in 2021. The EPC project would enter the industrialization phase from 2025.
- ▶ GERMANY: Lürssen intends to establish a long-term cooperation in naval shipbuilding with German Naval Yards Kiel (GNYK). The existing military and naval surface shipbuilding activities are to be contributed into a joint company and led by Bremen-based

Lürssen Group. The national champion, TKMS has reportedly been left out of further talks.

- ▶ ITALY: Thyssenkrupp is reportedly in talks with Fincantieri about a merger of their defense units, in a proposed 50-50 joint venture with combined sales of 3.4 billion euros (\$3.7 billion). Fincantieri defense activities accounted for 1.6 billion euros of sales last year.
- ▶ RUSSIA: Atomflot and Zvezda Shipyard of Rosneft signed in late April 2020 a contract to build the 'Leader' (project 10510) nuclear icebreaker. The ship has to become operational in 2027

SPACE SYSTEMS

- ▶ USA:
- ▶ USA: VOX Space, the Virgin Orbit subsidiary which provides responsive and affordable launch services for the U.S. national security community, has signed a new agreement with the Department of the Air Force, allowing the company's LauncherOne system to conduct missions to space from Andersen Air Force Base in Guam.
- ▶ USA: Pryer Aerospace has signed a multi-year contract with Blue Origin. Under this contract, Pryer will provide large complex machined parts and leading edge structures for New Glenn, Blue Origin's massive heavy-lift orbital launch vehicle, designed to support national security space launch and commercial space missions for years to come.
- ▶ USA: Aerojet Rocketdyne recently completed a successful static-fire test of an advanced large solid rocket motor, called the Missile Components Advanced Technologies Demonstration Motor (MCAT Demo), under contract to the Air Force Research Laboratory (AFRL).
- ▶ USA: Planet Labs Inc. has announced they will launch 6 SkySat satellites, SkySats 16-21, on 2 Falcon 9 rockets as rideshare missions on two Starlink launches. These 6 satellites will help provide Planet with more imaging coverage to complement the 15 other SkySat satellites, SkySat 1-15, in Sun-Synchronous Orbits (SSO). The first three satellites, SkySat 16-18 will launch on the ninth Starlink (L8) mission which is targeted for some time in June. SkySat 19-21 will launch on another mission later in the summer.
- ▶ USA: Rocket Lab's Electron Rocket has been raised onto its launchpad ahead of the company's upcoming mission with the U.S. Space Force (USSF). The rocket, powered by its 3D printed Rutherford engines, has passed initial system testing and was rolled out to Launch Complex 2, at the Mid-Atlantic Regional Spaceport last week. In the mission scheduled for Q3 2020, Rocket Lab will launch a microsatellite from the USAF research laboratory's Monolith program, in order to determine the ability of small satellites to support large aperture payloads and to monitor space weather.
- ▶ USA: SpaceX CEO stated that for flights made to LEO, Starship and its Super Heavy launch vehicle are expected to cost \$1mn/launch, provided that fuel costs are eliminated, and capitalizing on economies of scale. With fuel, the company hopes to bring down costs to \$150k/launch, for a total sum of \$1.5mn when delivering 150t to orbit. Currently SpaceX charges roughly \$150mn/launch for delivering 70t to LEO.
- ▶ USA: LeoLabs unveiled a service May 13 to help commercial and government satellite operators avoid collisions with debris and other satellites in LEO. The startup operates 3 ground-based phased array radars to track satellites and debris. Drawing on the radar data, it created a suite of cloud-based services, called 'Collision Avoidance', to alert customers to conjunctions and help them assess the risk of collisions.
- ▶ USA: NASA signed a deal with Virgin Galactic, giving the company insight into "technologies developed over the last 50 years" as they work to develop a new supersonic, commercial aviation vehicle. The company said it's still in the very early stages of designing a new vehicle for supersonic transit, and it won't necessarily use rocket engines or carry people to outer space.
- ▶ USA: DARPA expects to start launching Blackjack satellites as soon as late this year. The first Blackjack demo satellite mission, Mandrake 1, is a cubesat that will carry supercomputer processing chips. The second, Mandrake 2, is a pair of small satellites that will carry optical inter-satellite links for broadband data. Those satellites will launch in late 2020 or early 2021.
- ▶ AUSTRALIA: Hybrid rocket launch provider Gilmour Space Technologies inked a strategic agreement with the Australian DoD's Defence Science & Technology (DST) group to work together on military-related space technologies (propulsion, materials, avionics technologies). The partnership aim at developing a 3-stage hybrid rocket that will launch small payloads and satellites.
- ▶ CHINA: The Kuaizhou rocket industrial park, which is based in Wuhan, has been partially put into operation, according to China Aerospace Science and Industry Corp (CASIC). After it is fully operational, the park is expected to be capable of completing the assembly and testing for 20 solid-fuelled carrier rockets annually.
- ▶ CHINA: A Chinese Kuaizhou-1A (Y6) rocket has launched the first two operational satellites for the Xingyun narrowband constellation. The 2 satellites Xingyun-2 (01) 'Wuhan' and Xingyun-2 (02) were developed by the Xingyun Satellite Co., a subsidiary of China Aerospace Science and Industry Corporation (CASIC), Sanjiang Group, in Wuhan.

- ▶ CHINA: The 45th satellite of the BeiDou Navigation Satellite System (BDS) has started operation in the network after completing in-orbit tests, according to the Satellite Navigation System Management Office. The satellite will provide services in place of the 3rd BeiDou satellite, a geostationary earth orbit satellite of the BDS-2 system. The replacement will help reinforce the BDS-2 system and support a smooth transition from the BDS-2 system to the BDS-3 system.
- ▶ CHINA: On 11 May, the empty core stage of the CZ-5B rocket, re-entered the dense layers of the atmosphere, impacting the Atlantic Ocean off the West African coast of Mauritania. The spent 18t core stage was the largest piece of space debris to fall uncontrolled back to Earth since 1991 and the 4th biggest ever. For the launch of the main modules of the China Space Station three more launches of the CZ-5B are required.
- ▶ CHINA: A next-generation Chinese crewed spacecraft landed last week after a nearly 3-day test flight. The spacecraft, launched without a crew on a Long March 5B, performed several maneuvers during the mission, raising the apogee of its orbit to about 8,000km in order to test a high-speed reentry like that for a return from a mission beyond Earth orbit. While a fully-functional version of the spacecraft can support missions to deep space, China's crewed lunar plans are vague, with such mission potentially taking place in the mid-2030s.
- ▶ RUSSIA: The Soyuz-7 rocket for blastoffs from the Sea Launch floating spaceport is planned to be equipped with the new Fregat-SBU upper stage, the Lavochkin Research & Production Association said. "At the end of 2020, the development of a preliminary design will be completed. The first launch of the Fregat-SBU upper stage using the Soyuz-7 launch vehicle is planned to be conducted in 2025."
- ▶ LUXEMBOURG: Satellite operator Intelsat SA filed for bankruptcy protection after falling short of the cash it needed to make airwaves available to be sold to wireless operators in a coming government auction.
- ▶ EUROPE: Members of the European Parliament (EP) are asking for government support for Europe's space industry because of the pandemic. 7 MPs wrote recently to Thierry Breton, the Commissioner overseeing space in the European Commission (EC), warning that the industry could lose a billion euros this year. The MPs are asking the commission to support a budget for EU space activities of €16bn from 2021 through 2027, after earlier reports that the EU was considering a smaller budget that supports its work on the Galileo and Copernicus programs
- ▶ EUROPE: Airbus has won the new satellite communications framework contract for military and civil missions of the European Union and its member states. This four-year framework contract was awarded by the European Defence Agency (EDA) and is estimated to be worth "tens of millions of euros". The contract named 'EU SatCom Market' will allow EU member states to centralise their Satcom requirements (in C, Ku, Ka and L frequency bands), and obtain coordinated, more economical and effective access to these services.
- ▶ UK: Sir Richard Branson, founder of the Virgin Group conglomerate, will sell as many as 25mn of his shares in Virgin Galactic, worth about \$500mn. The group said it "intends to use any proceeds to support its portfolio of global leisure, holiday and travel businesses that have been affected by the unprecedented impact of COVID-19."
- ▶ UK: Having launched the ambitious \$5bn (\$6.2bn) project in 2018, after having effectively been frozen out of Galileo following the 2016 brexit decision, the UK government is now reportedly being pressed by civil servants to abandon its efforts on cost grounds. As reported by The Telegraph on 8 May, the plan for the UK to field its own bespoke replacement for Galileo, which would also serve as a national alternative to the US GPS, is said by the Cabinet Secretary, Sir Mark Sedwill, to be unaffordable and should be wound-down.

