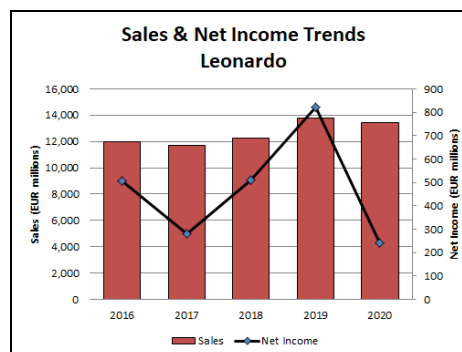


Leonardo

Outlook

- For 2020, Leonardo posted sales of EUR13.4 billion, down almost 3 percent from sales of EUR13.8 billion in 2019
- The company reported net income of EUR243 million, compared with EUR822 million for 2019
- With vaccine distribution increasing and air travel returning, the company is looking forward to the nascent recovery
- IPO was attempted for Leonardo DRS in the U.S., but quickly postponed due to weak market interest



Headquarters

Leonardo SpA
4, Piazza Monte Grappa
00195 Rome, Italy
Telephone: + 39 06 324731
Website: <https://www.leonardocompany.com>

Leonardo, formerly Finmeccanica, is Italy's largest aerospace and defense conglomerate. The firm was established in 1948 as a subholding for the mechanical industry of state-owned IRI-Istituto per la Ricostruzione Industriale (Italian Institute for Industrial Reconstruction). Today, the Italian Ministry of the Economy and Finance owns 30 percent of the company's shares; Italian and foreign investors hold the remaining shares.

In 1995, Finmeccanica acquired the operations of its rival EFIM. Among the properties in the EFIM group were Italy's major helicopter manufacturer Agusta SpA, sensor company Galileo, electronics firm Segnalamento

Marittimo ed Aereo SpA (SMA), light artillery manufacturer Breda Meccanica, and naval arms and armor manufacturer Oto Melara. Leonardo represents about 75 percent of Italy's defense industrial base.

In 2008, the company acquired U.S.-based DRS Technologies in a deal valued at \$5.2 billion. The purchase gave Finmeccanica a foothold in the U.S. defense market.

In 2016, the company embarked on a transformation that would bring all of its various operations under one banner. The former subsidiary companies – AgustaWestland, Alenia Aermacchi, Oto Melara, Selex ES, and WASS – were absorbed into the parent operation. As part of this effort, the company was renamed Leonardo, effective January 1, 2017. The name is inspired by 15th-century Italian artist and inventor Leonardo da Vinci.

Structure and Personnel

Alessandro Profumo
Chief Executive Officer
Lucio Valerio Cioffi
General Manager
Stefano Amoroso
Communication Director
Fabio Barsotti
Manufacturing and Program Management
Optimization
Norman Bone
Managing Director, Electronics Division

Zaira Burlo
Customer Support, Services & Training
Giacinto Carullo
Chief Procurement & Supply Chain Officer
Gian Piero Cutillo
Managing Director, Helicopter Division
Pasquale Di Bartolomeo
Chief Commercial Officer and
CEO, Leonardo International
Marco Di Capua
Chief Audit Executive



Leonardo

Alessandra Genco
Chief Financial Officer

Filippo Maria Grasso
Italian Institutional Affairs Director

Simonetta Iarlori
Chief People, Organization and Transformation Officer

Salvatore Lampone
Chief Risk Officer

William J. Lynn III
Chief Executive Officer, Leonardo DRS

Andrea Parrella
General Counsel

Luigi Pasquali
Coordinator, Space Activities

Enrico Peruzzi
New Business Development and Country Support Director

Tommaso Profeta
Managing Director, Cyber Security Division

Andrea Salpietro
Chief Security Officer

Enrico Savio
Chief Strategy & Market Intelligence Officer

Giancarlo Schisano
Managing Director, Aerostructures Division

Laurent Sissman
Unmanned Systems Manager

Giovanni Soccodato
Chief Strategic Equity Officer

Marco Zoff
Managing Director, Aircraft Division

Leonardo DRS

William J. Lynn III
Chief Executive Officer

John Baylouny
Executive Vice President and Chief Operating Officer

Michael Dippold
Executive Vice President, Chief Financial Officer

Mark A. Dorfman
Executive Vice President, General Counsel and Secretary

Sandra L. Hodgkinson
Senior Vice President, Strategy and Corporate Development

Michael Coulter
Senior Vice President, Corporate Business Development and President, International

Matthew H. Green
Senior Vice President, Government Relations

Tami E. Gesiskie
Senior Vice President, Human Resources

Joseph P. Militano
Senior Vice President, Public Affairs and Communications

Sally A. Wallace
Executive Vice President, Operations

Jason Rinsky
Senior Vice President, Chief Tax & Treasury Officer

Pam Morrow
Senior Vice President, Corporate Controller

Product Area

Leonardo is an OEM and Tier 1 supplier. Under the company's "One Company" restructuring effort begun in 2016, the firm is now focused on its core markets in the following sectors: helicopters; aeronautics; space; and the catchall electronics, defense, and security systems. The company serves these sectors through seven divisions formed from the legacy companies of AgustaWestland, Alenia Aermacchi, Selex ES, Oto Melara, and WASS. Previously, the corporate headquarters acted as more of a holding company for the aforementioned operating brands. The aim of the restructuring effort is to cut costs by removing duplication of effort in areas such as R&D and to divest unprofitable activities across the board.

This strategy follows the playbook of many industrial consolidations, with the focus being on core activities. In Leonardo's case, this means concentrating on operations in the aerospace, defense, and security industries. Over the next several years, operations that do not fit in this paradigm will be divested, merged, or

closed. This trimming of the portfolio should help the firm increase its focus and better deploy limited resources to support growth in an anemic home market.

The organization is currently believed to be structured as follows:

1. Helicopters
 - 1.1 Civil
 - 1.2 Military
 - 1.3 Kopter
 - 1.4 PZL-Swidnik
2. Aeronautics
 - 2.1 Military Aircraft
 - 2.2 Aerostructures
 - 2.3 ATR (50%)
3. Space
 - 3.1 Telespazio (67%)
 - 3.2 Thales Alenia Space (33%)
 - 3.3 Avio (29.63%)

Leonardo**4. Defense Electronics & Security****4.1 Electronics****4.1.1 Airborne and Space Systems****4.1.2 Land and Naval Defense Electronics****4.1.3 Defense Systems****4.2 Leonardo DRS****4.2.1 Airborne and Intelligence Systems****4.2.2 Daylight Solutions****4.2.3 Electro-Optic and Infrared Systems****4.2.4 Global Enterprise Solutions****4.2.5 Land Electronics****4.2.6 Land Systems****4.2.7 Naval Electronics****4.2.8 Naval Power Systems****4.3 MBDA (25%)****4.4 Vitrociset****4.5 Elettronica (31.33%)****4.6 Cyber Security**

Helicopters. This unit, composed of the former AgustaWestland operations, manufactures civil and public utility helicopters for executive transport, emergency medical services, and commuter and support services for oil platforms. It also produces military, patrol, and supervision combat helicopters. In addition, this division is involved in helicopter retrofit, overhaul, and maintenance. Models currently being developed include the AW109 Trekker and AW609 tiltrotor. Leonardo stated on Twitter that the AgustaWestland branding, or "AW," will continue to be used at the product level.

Kopter. Acquired in April 2020, this Swiss subsidiary produces the SH09 single-turbine helicopter.

PZL-Swidnik SA. This is a Polish subsidiary that manufactures helicopters and aircraft structures for the fixed-wing market. Major products include the SW-4 and W-3A Sokol helicopters.

Aeronautics. This unit, formerly Alenia Aermacchi, designs, constructs, and services trainer aircraft, military aircraft, special mission aircraft, and unmanned systems.

Military Aircraft. This unit participates in the production of the Tornado multirole combat aircraft, AMX close support aircraft, M-346 trainer, Eurofighter Typhoon air superiority aircraft, and G222 tactical aircraft and its derivative, the C-27J. This unit is also working on the nEUROn – the European technology demonstrator for an unmanned aircraft – and the U.S. F-35 Lightning II program. New projects include the Tempest in the United Kingdom, Sweden, and Italy and the MALE2025/Euromale UAV program in partnership with Airbus and Dassault.

Aerostructures. This division, born of Alenia Aermacchi's aerostructures operations, provides structures and components for large commercial aircraft and executive jets. It serves as a participant or subcontractor on Airbus (A319, A320, A321, A330/340, A500/600, A380) and Boeing (717, 757, 767, 777) programs and on the new 787 and Dassault (Falcon 900EX and 2000) programs. This unit produces moving surfaces, radomes, tail surfaces, vertical rudders, fins, flap parts, and fuselage panels and sections.

ATR. Avions de Transport Régional (ATR) is a 50-50 joint venture between Airbus and Leonardo. ATR has developed a family of high-wing, twin turboprop aircraft in the 30- to 78-seat market: the ATR 42 and ATR 72.

Space. Operations are conducted through Telespazio (67% Leonardo / 33% Thales) and Thales Alenia Space (67% Thales / 33% Leonardo), the two joint ventures established with Thales as part of the Space Alliance. The ventures provide satellite services and manufacture satellites and orbiting infrastructures. Avio designs and produces space launch vehicles such as the Vega.

Defense Electronics & Security. This sector produces ISR, C4I, and ISTAR systems; combat and mission management systems; tactical unmanned systems; radar; communications, electronic warfare, optronics, infrared search and track, artillery, and underwater systems; air and maritime traffic management systems; automation systems; and space payloads and equipment.

Airborne and Space Systems. Products produced by this division include integrated mission systems, airborne radars and sensors, electronic warfare systems, aerial target systems, simulation systems, and onboard avionics. The division's space systems operations manufacture sensors, mission payloads, and robotic systems.

Land and Naval Defense Electronics. This division develops products that provide information superiority, situational awareness, command and control capability, weapons systems management, and network communications. Products include electro-optical systems, airborne radars, defense and secure communications systems, and naval surface radars.

Defense Systems. This unit handles the development and production of integrated air defense systems; ground and naval missiles and weapons systems; land-based and shipborne surveillance and fire control radars; armored vehicles; naval, anti-aircraft, and field artillery;

Leonardo

naval surface and underwater systems; torpedoes; and remotely piloted vehicles.

Leonardo DRS. Formerly known as DRS Technologies, this U.S. subsidiary deals with the supply of products, services, and integrated support for military forces, intelligence agencies, and defense companies around the world. Key products include thermal imaging devices, combat display workstations, electronic sensor systems, power systems, rugged computer systems, air combat training systems, mission recorders, deployable flight incident recorders, environmental control systems, telecommunication systems, aircraft loaders, and military trailers and shelters. The firm also provides integrated logistics, training, and support services.

MBDA. This joint venture, established with BAE Systems and Airbus, manufactures missile systems (covered in a separate report).

Vitrociset custom designs and manages complex systems in the networking, cybersecurity, information and communication technology, and modeling and simulation fields.

Elettronica produces surveillance, self-defense, and electronic warfare systems.

Cyber Security. Formed in 2018, this new division encompasses the Cyber Security and ICT Solutions and Homeland Security and Critical Infrastructure business lines of the former Security and Information Systems division.

Facilities

Major operations of Leonardo are as follows. For a full facility listing please see:

<https://www.leonardocompany.com/en/global>

Leonardo Aircraft, Via Ing. Paolo Foresio, 1-21040 Venegono Superiore, Italy. Telephone: + 39 0331 8131111. This is the company headquarters. Formerly known as Alenia Aermacchi, this unit has roles in the Eurofighter Typhoon, F-35 Joint Strike Fighter, and Neuron European programs. It also produces components and aerostructures for commercial aircraft, including the Airbus A380, Boeing 787 Dreamliner, and Bombardier CSeries. In addition, the company produces the M-346 military training aircraft.

Avions de Transport Régional, 1, Allée Pierre Nadot – 31712 Blagnac cedex, France. A joint venture with Airbus SE, ATR produces the ATR 42 and ATR 72 family of regional transport aircraft.

Website: <https://www.atr-aircraft.com>

Telespazio SpA, Via Tiburtina, 965, 00156 Rome, Italy. Telephone: + 39 06 40791. A joint venture between Leonardo (67 percent) and Thales (33 percent), Telespazio concentrates on the operation of and services for satellite systems.

Website: <https://www.telespazio.com>

Thales Alenia Space, Via Saccomuro, 24-00131 Rome, Italy. Telephone: + 39 06 41511. This is the Italian headquarters for the joint venture between Thales (67 percent) and Leonardo (33 percent).

Website:
www.thalesgroup.com/en/global/activities/space

Leonardo Helicopters, 520, Viale Giovanni Agusta, 21017 Cascina Costa di Samarate (Varese), Italy.

Telephone: + 39 331 229111. Formerly known as AgustaWestland, Leonardo Helicopters designs, develops, and manufactures helicopters and fixed-wing aircraft for both civil and military applications. In addition, the company manufactures helicopters under license from other manufacturers, such as Bell and Sikorsky of the United States.

PZL-Swidnik SA, Aleja Lotników Polskich 1, 21-045 Swidnik, Poland. This operation manufactures helicopters and aircraft components and structures.

Website: <https://www.pzlswidnik.pl/>

Leonardo DRS, 2345 Crystal Dr, Suite 1000, Arlington, VA 22202 USA. Telephone: + 1 (703) 416-8000. Leonardo DRS specializes in thermal imaging devices, combat display workstations, electronic sensor systems, power systems, battlefield digitization systems, and deployable flight incident recorders. Other areas of focus include communications and surveillance systems, diagnostics and test systems, and training and simulation systems.

Website: <https://www.leonardodrs.com>

Selex ES Inc, 4221 Tudor Ln, Greensboro, NC 27410-8105. Telephone: 1 (877) 773- 5724. This U.S. subsidiary manufactures air traffic management systems, land mobile radios, and license plate readers.

Website: <https://www.leonardocompany-us.com>

Electronics Division, Via Lunga, 2, 25126 Brescia Italy. Telephone: +39 030 37911. This facility designs and develops small-caliber naval weapons and airborne weapons.

Electronics Division, Viale Europa s.n.c., Nerviano (MI), Italy. Telephone: +39 0331 587330. This location

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manufactures airborne radars and computers, and space equipment.

Leonardo MW Ltd, Sigma House, Christopher Martin Rd, Basildon, Essex SS14 3EL, United Kingdom. Telephone: + 44 0 1268 823400.

Website: <https://uk.leonardocompany.com>

Leonardo Defense Systems, 48, Via Levante, 57128 Livorno, Italy. This division, formerly known as Whitehead Alenia Sistemi Subacquei (WASS), manufactures torpedoes, magnetic mines, sonars, and countermeasures systems for warships.

Larimart SpA, Via di Torvecchia, 12 00168 – Rome, Italy. Telephone: +39 06.30.34.31. This subsidiary produces communication systems for defense, security and emergency markets.

Website: <http://www.larimart.it>

MBDA Italia, Km 12.400, Via Tiburtina, 00131 Rome, Italy. This is a missile-oriented joint venture made up of Airbus SE (37.5 percent), BAE Systems (37.5 percent), and Leonardo (25 percent).

Website: <https://www.mbda-systems.com>

Corporate Overview

Leonardo, formerly Finmeccanica, is *the* Italian defense company. Today, following a series of restructuring efforts, the company is a global player in the aerospace, defense, and security markets.

New Products and Services

U212 Submarine Systems. In February 2021, Leonardo signed a contract with Fincantieri worth approximately EUR150 million to provide equipment for the initial two U212 Near Future Submarines (NFS), the first of which is due to join the Italian Navy fleet in 2027. The contract includes the design and development of a next-generation combat management system (CMS) as part of the Italian Navy's "Naval Law" modernization program. In addition to the CMS, Leonardo will also provide a simulation and training laboratory at the Italian Navy's Submarine Centre in Taranto and a package of logistic support, including staff training and a set of spare parts.

SRT-400. In February 2021, Leonardo was awarded a contract by Northrop Grumman to provide its new high-frequency (HF) radio system, the SRT-400, for the U.S. Navy's fleet of E-2D Advanced Hawkeye airborne early warning and control aircraft.

Lionfish. In October 2020, Leonardo unveiled Lionfish, a new family of small-caliber remotely controlled naval defense turrets. The new line consists of four models: Lionfish 12.7mm Inner Reloading, Lionfish 12.7mm Ultralight, Lionfish 12.7mm Top, and Lionfish 20mm.

AeroBOSS. In September 2020, Leonardo's U.S. subsidiary, Selex ES Inc, added the AeroBOSS line of airport surface management technologies to its air traffic control solutions portfolio. These technologies offer real-time, collaborative decision-making, flight and ground vehicle tracking, and runway safety systems that allow surface vehicles to operate more safely and efficiently.

AeroBOSS provides an airport-wide common operating platform enabling command and control of airport operations, maintenance, and emergency resources. One of the core AeroBOSS solutions is the AeroBOSS Runway Incursion Warning System (RIWS), which prevents runway accidents by alerting vehicle drivers of hazards before entering the runway area.

ECRS Mk 2. In September 2020, BAE Systems and Leonardo were awarded a GBP317 million contract to develop the active electronically scanned array (AESA) European Common Radar System Mk 2 (ECRS Mk 2) to a standard ready to be integrated on RAF Eurofighter Typhoons. BAE Systems, the U.K.'s prime contractor for the Typhoon, will integrate the new sensor, which will be developed by Leonardo. Both companies are currently working as part of a four-nation development program alongside Eurofighter consortium partners in Germany, Spain, and Italy on a baseline version of the AESA radar. The U.K.'s commitment follows a similar commitment from Germany and Spain to deliver their own national requirements for an AESA radar.

Danish Naval Gun Maintenance. In June 2020, Leonardo signed a 20-year agreement with the Danish Defence Acquisition and Logistics Organization (DALO) that provides for logistics support and the possible future upgrade of the seventeen 76/62 Super Rapid Gun Mounts in service on the Danish Navy's Iver Huitfeldt class frigates, Thetis class inspection ships, and Knud Rasmussen class inspection ships. The agreement is worth up to EUR70 million.

New Generation IFF. In March 2020, Leonardo signed a EUR75 million contract with the Italian defense authorities to supply and install New Generation Identification Friend or Foe (NGIFF) identification equipment, updated to the latest NATO Mode 5 Baseline 3 standard, for the Italian armed forces' land and naval platforms. The six-year contract covers the supply of several hundred NGIFF

Leonardo

interrogators and cryptographic units in order to upgrade dozens of land and naval platforms across 15 classes and types.

Interconnection Equipment Contract. In February 2020, Leonardo DRS was awarded a contract worth up to \$808 million to provide a suite of electronic products to link C5ISR equipment to combat vehicles across the armed services and to satisfy interconnection requirements for federal agencies. Under the indefinite delivery/indefinite quantity (IDIQ) Interconnection Equipment Contract from the Defense Logistics Agency Land, Aberdeen Proving Ground in Maryland and Leonardo DRS would deliver wiring harnesses, installation kits, cable assemblies, cabling, connectors, and services. The products will be delivered to the Department of Defense and other U.S. federal agencies.

TH-73A Helicopter. In January 2020, Leonardo, through AgustaWestland Philadelphia Corp, was awarded a firm-fixed-price contract valued at \$176.5 million for the production and delivery of 32 TH-73A helicopters, initial spares, support, dedicated equipment, and specific pilot and maintenance training services. The helicopters, based on Leonardo's TH-119 model, are used by the U.S. Navy for training and will replace the service's aging Bell TH-57B/C Sea Rangers. Production will run through October 2021.

In November 2020, the U.S. Department of Defense exercised a \$171 million option for an additional 36 TH-73A aircraft, with work expected to be completed in December 2022 in Philadelphia, Pennsylvania. (See **Teaming/Competition/Joint Ventures** for competition details.)

P5 Combat Training System. In December 2019, Cubic awarded Leonardo DRS several contracts, worth a total of \$60 million, to deliver more than 250 P5 Combat Training System (P5CTS) pods and associated services. In November 2018, Leonardo DRS was awarded a contract from Cubic to deliver more than 500 P5CTS internal subsystems for the F-35 Lightning II. With this order, over 1,000 F-35 aircraft will be equipped with this training equipment. The P5CTS internal subsystems would be delivered to Cubic Corp over the next four years as part of Lockheed Martin's F-35 production Lots 12-14.

MAIR. At the 2019 Paris Air Show, Leonardo exhibited its new Multiple Aperture Infra-Red (MAIR) missile warning system, which offers enhanced situational awareness and survivability for aircraft crews. According to the company, MAIR uses multiple distributed cameras for complete spherical coverage around an aircraft, providing a high probability of detection and early warning of incoming missiles with a very low false alarm rate, even in heavily cluttered

airspace. The system was successfully tested during 2018's Surface-to-Air Launch Trials (Salt III) and was expected to be ready for full production in 2020.

USSOCOM Satcom Contract. In May 2019, Leonardo DRS was awarded a contract worth up to \$977 million by the Defense Information Technology Contracting Organization to provide the U.S. Special Operations Command (USSOCOM) with worldwide satellite communications (satcom). Under the Blanket Purchase Agreement contract, the work can extend up to eight years, and services can be requested by the customer that will not exceed \$977 million. Leonardo DRS will provide USSOCOM's Global Access Network (GAN) system, an end-to-end custom-engineered, global commercial satellite communications solution, engineered to meet USSOCOM's unique COMSATCOM needs.

NATO JEWCS. In February 2019, Leonardo signed a contract worth approximately EUR180 million to provide new electronic warfare training equipment for the NATO Joint Electronic Warfare Core Staff (JEWCS). Leonardo was selected in an international competition and will incorporate technology from partners Cobham and Elettronica. The contract was placed by the U.K. Ministry of Defence. Equipment will be delivered in tranches over a period of four years from Leonardo's Electronic Warfare center of excellence in Luton, England.

Plant Expansion/Organization Update

DRS Postpones IPO. In March 2020, Leonardo officially postponed the initial public offering (IPO) of shares of Leonardo DRS Inc shortly after it was announced. The company said that "adverse market conditions did not allow an adequate valuation of DRS." The company had hoped to raise \$807 million from an offering of 31.9 million shares at a price range between \$20.00 and \$22.00 per share. Leonardo planned to hold a 78 percent stake following the IPO.

CEO Under Fire. In October 2020, CEO Alessandro Profumo was found guilty of false accounting and market manipulation offences at his previous job as president of the Italian bank MPS and sentenced to six years in prison. In addition, he was fined EUR2.5 million and barred from holding company directorships for two years. According to a report in *Defense News*, Italian jail sentences only become effective after cases are heard by an appeals court and then by Italy's Supreme Court – a process that can take years. In a statement, the company said it "expresses its full confidence in the actions of Mr. Profumo and wishes for his continuation in the role."

Leonardo

Brazilian Helicopter Support Center. In February 2020, Leonardo broke ground on a new helicopter customer service in Itapevi, Brazil. Construction of the new facility, run by Leonardo do Brasil over a 79,000-square-meter area, is scheduled to be completed in 2021. The new campus will include maintenance hangars, bonded warehouse, workshops, and other supporting services, including a dedicated heliport. Services provided include spares, maintenance, product support, and engineering services for the AW119 single engine, AW109 light twin series, and AW family, including the AW139, AW169, and AW189 types.

Telespazio Expands in South America. In February 2020, Leonardo, through its subsidiary Telespazio Brasil, and the Maricá municipality represented by Codemar agreed to develop a new satellite teleport for telecommunications applications in the territory of Maricá, Brazil. The new teleport will provide telecommunication services for the geostationary Earth orbit (GEO) satellites as well as low latency, very high-bandwidth services for the low-Earth orbit (LEO) satellite constellations. According to the company, this new facility is positioned to support the growth in demand and challenging requirements generated by the oil and gas sector in the region as well to seize opportunities in other sectors, such as government and maritime operations.

Leonardo Labs Launched. In December 2019, Leonardo formed a new research plan dubbed Leonardo Labs. The focus of Leonardo Labs will be on new technologies: big data, high-performance computing and simulation, artificial intelligence and autonomous systems, quantum technologies and cryptography, electric mobility, materials, and structures. The operation will be headquartered in Genoa, Italy.

Melbourne Expansion. In September 2019, Leonardo DRS announced that its Land Electronics and Electro-Optical and Infrared Systems businesses had opened a new facility in Melbourne, Florida. The new two-story building provides an additional 38,000 square feet on the Melbourne campus, including 18 percent more engineering lab space and 30 percent more office space for engineers and staff. This added space accommodates the growing demand for electronics systems and infrared technologies, the company said.

San Diego Expansion. In July 2019, Leonardo DRS announced that its DRS Daylight Solutions business had opened a new facility in San Diego. To accommodate the speed of growth, the three-story, 67,792-square-foot building provides approximately 50 percent more space than the previous facility, including 71 percent more lab space, 60 percent more warehouse space, and 60 percent more office space for engineers and staff. This added

space accommodates the growing demand for the company's expanding line of laser-based products.

Missouri Expansion. In February 2019, Leonardo DRS announced it would build a new engineering development and light manufacturing facility in Bridgeton, Missouri, to accommodate its growing Land Systems line of business. The campus will serve as the focal point for the majority of the business unit's development and platform systems integration activities. The new facility was expected to be ready by early 2020.

In addition, the company announced it would expand its West Plains, Missouri, campus with a new administration facility. This office will open in late 2019 or early 2020.

Pisa Facility Opened. In February 2019, Leonardo opened a new facility in Pisa, Italy, dedicated to the development and production of the AWHero Rotary Unmanned Air System (RUAS). The facility employs 60 people.

Electronics Division Formed. In December 2018, Leonardo announced the formation of a new Electronics division. The division will merge the current Land and Naval Defense Electronics, Airborne and Space Systems, and Defense Systems divisions under one umbrella. In addition, the Traffic Control Systems and Automation Systems lines of business, previously part of the Security and Information Systems division, have also been transferred to the new division.

Australian Expansion. In October 2017, Leonardo, through its subsidiary Selex ES Australia Pty Ltd, announced a new facility in Rockingham, south of Perth. The site, which is close to the Henderson shipyards and Garden Island, will provide engineering, integration, installation, and throughlife support for naval programs. Leonardo is working as prime system integrator on the SEA 1442 program that upgrades communications capabilities on Australia's ANZAC frigates.

Airborne Systems Facility Opened. In July 2017, Leonardo opened its airborne systems facility in L'Aquila, Italy. Leonardo started reconstruction of the site immediately following an earthquake in 2009 that damaged the structural integrity of the original buildings. The industrial park comprises two main production facilities, one of which is the newly inaugurated 4,500-square-meter site that hosts a total of 450 staff. Activities at L'Aquila are focused on identification friend or foe (IFF) systems for civilian and military aircraft and equipment for airborne communications.

Leonardo

New Organizational Model. In 2015, Leonardo initiated a number of legal steps as part of its New Organizational and Operating Model initiative, dubbed "One Company." In September 2015, Leonardo began the process of changing its core aerospace and defense subsidiaries – Oto Melara, Whitehead Sistemi Subacquei, Alenia Aermacchi, AgustaWestland, and Selex ES – into divisions. In other words, Leonardo turned these formerly independent yet wholly owned businesses into corporate divisions rather than subsidiaries. As part of its reorganization, the company adopted a new name – Leonardo – after Italian artist and inventor Leonardo da Vinci. The new name took effect on January 1, 2017.

Mergers/Acquisitions/Divestitures

Leonardo to Acquire a 25 Percent Stake in Hensoldt. In April 2021, Leonardo entered into a definitive agreement to purchase a 25.1 percent stake in Hensoldt AG for EUR606 million (\$733 million), or EUR23 (\$28) per share, from Square Lux Holding II Sàrl, a portfolio company controlled by funds advised by Kohlberg Kravis & Roberts & Co LP. Hensoldt is a key European player in the field of sensor solutions for defense and security applications, with an expanding portfolio in cybersecurity, data management and robotics. As a result of the stake purchase, Leonardo will become the largest shareholder of Hensoldt alongside Kreditanstalt für Wiederaufbau (KfW), which is 80 percent owned by the Federal Republic of Germany. KfW agreed to acquire a 25.1 percent stake in Hensoldt in March 2021.

Kopter Acquisition. In January 2020, Leonardo signed a contract with Lynwood (Schweiz) AG to acquire Kopter Group AG in a deal valued at \$185 million. Kopter is producing the SH09, a new single-engine helicopter, which will expand Leonardo's single-engine rotorcraft offerings. Within the Helicopter Division of Leonardo, Kopter will act as an autonomous legal entity and competence center working in coordination with Leonardo's rotorcraft operations. The closing of the transaction took place in April 2020.

Website: <https://koptergroup.com>

Vitrociset Acquisition. In September 2018, Leonardo exercised its right of first refusal to purchase 98.54 percent of Vitrociset, of which it held a 1.46 percent stake. This followed the notification of an offer received in August from shipbuilder Fincantieri. The Italian government has since stepped in, as it owns major stakes in both the acquiring companies. Leonardo won out and completed its acquisition of all shares in January 2019. The transaction strengthens Leonardo Services operations, primarily in the

Logistics, Simulation and Training and Space Operations sectors.

Website: <http://www.vitrociset.it/>

Daylight Solutions Acquisition. In June 2017, Leonardo DRS completed its purchase of Daylight Solutions Inc, a developer and supplier of quantum cascade laser products and technology, for \$150 million. Both Leonardo DRS and Daylight Solutions focus on infrared research and product development. The integrated laser and sensor systems developed by the two companies can be used in a variety of applications, including aircraft survivability products and medical and industrial applications (imaging for cancer diagnostics and chemical detection), Leonardo said in a statement.

Leonardo Increases Stake in Avio. In March 2017, Cinven completed its divestment plan for Avio in a complex transaction that resulted in Leonardo doubling its holding in Avio. Under the deal, Cinven sold its 85.7 percent stake, split equally between Space2, a special-purpose acquisition company, and Leonardo. The deal was implemented through the merger of Avio into Space2, with the subsequent name retention of Avio. The transaction valued Avio at EUR160 million. As a result, Leonardo has doubled its stake in Avio from 14 percent to 28 percent at a cost of about EUR43 million. Other investors in the "new Avio" include a group of Avio managers, with a stake of nearly 4 percent. The remainder of the company is publicly held by Space2 shareholders. The deal was first announced in October 2016. In June 2020, Leonardo increased its stake in Avio to 29.63 percent.

Website: www.avio.com

Sistemi Dinamici Acquired. In December 2016, Leonardo acquired control of Sistemi Dinamici SpA for an undisclosed amount. The purchase, which involved the remaining 60 percent of shares, is aimed at strengthening Leonardo's position in the UAV market thanks to the acquisition of the AWHero unmanned lightweight helicopter program. Sistemi Dinamici was originally established in 2006 as an engineering venture between Ingegneria dei Sistemi SpA (60 percent) and AgustaWestland (40 percent) to support AgustaWestland in product innovation.

In September 2019, this operation, which is directly and wholly owned by Leonardo, was merged into Leonardo as part of the overall "One Company" effort to optimize the company's core business.

Rail Operations Sold. In December 2015, Leonardo completed the sale of its rail businesses – Ansaldo STS and AnsaldoBreda – to Hitachi Ltd. For Leonardo's 40 percent stake in Ansaldo STS, the Japanese

Leonardo

conglomerate paid EUR761 million. Hitachi paid EUR30 million for the acquisition of AnsaldoBreda. The move was undertaken to position Leonardo as a pure aerospace, defense, and security company, the firm said. The divestiture was first announced in February 2015.

DRS Units Sold. In November 2015, IAP Worldwide Services acquired DRS Technologies' Aviation and Logistics (A&L) business located in Oklahoma City, Oklahoma, and its Tactical Communications and Network Solutions (TCNS) business located at Aberdeen Proving Ground, Maryland. A&L provides aircraft repair management, logistics, and mission support services, while TCNS provides engineering, information technology, and communications support solutions to the U.S. Department of Defense and other agencies. Terms were not announced.

Fata Sold. In October 2015, Leonardo signed an agreement to sell Fata SpA to Danieli Group. Fata is active in the field of industrial plant engineering and has subsidiaries in the United States (Fata Hunter), India (Fata Engineering), China (Fata Shanghai), and the UAE (Fata Gulf). The deal was completed in 2016. Terms were not disclosed.

Tactical Technologies Acquired. In October 2014, Leonardo (Selex ES) completed the acquisition of Tactical Technologies Inc. Located in Ottawa, Canada, TTI is a supplier of electronic warfare analysis software and services. TTI is best known for its Tactical Engagement Simulation Software family of products. TESS products create physics-based simulations that assist with the analysis of electronic warfare products. Terms were not disclosed. The firm now operates as Leonardo Canada - Electronics.

Website: www.leonardocompany.ca

Teaming/Competition/Joint Ventures

AIR 6002 Phase 1. In June 2020, Australia issued a Request for Information on a new advanced jet trainer to replace BAE Systems Hawk 127s operated by the Royal Australian Air Force. The Future Lead-In Fighter Training System (LIFTS) project is estimated at \$4 to \$5 billion and is scheduled to begin in 2022 and run through 2033. The RAAF currently operates 33 Hawk 127s and associated ground and support systems. Competitors are expected to include BAE Systems' upgraded Hawk T2/128, Boeing's T-7A Red Hawk, Leonardo's M-346, and Korea Aerospace Industries' T-50.

Airbus. In December 2011, Airbus Defence and Space and Alenia Aermacchi (now the Aircraft division of Leonardo) signed a Memorandum of Understanding

(MoU) to explore collaboration on European medium-altitude, long-endurance (MALE) unmanned aircraft systems.

Air Launched Effects. In August 2020, the U.S. Army issued 10 Air Launched Effects (ALE) project agreements. ALE are a family of systems consisting of an air vehicle, payloads, mission system applications, and associated support equipment designed to autonomously or semi-autonomously deliver effects as a single agent or as a member of a team. Individual agreements for air vehicles were awarded to Northrop Grumman, Raytheon Technologies, and Area-I. Agreements for payloads were issued to Leonardo, Technology Service Corp (TSC), Raytheon Technologies, and Northrop Grumman. ALE mission systems agreements were placed with L3Harris, Collins Aerospace, and Aurora Flight Sciences.

Algeria. In March 2019, Leonardo and the Algerian Ministry of National Defense formed a joint venture for the local assembly, sale, and support of Leonardo helicopters. The joint venture (51 percent owned by the Ministry of National Defense and 49 percent by Leonardo) is headquartered in a new industrial facility at Aïn Arnat, in Sétif Province.

Allison Transmission. In November 2010, Leonardo DRS announced a partnership between its Test and Energy Management business unit and Allison Transmission Inc to provide onboard vehicle power on a variety of military platforms.

Argentina. In September 2016, Leonardo and the Argentinean Ministry for Science, Technology and Productive Innovation signed an MoU to evaluate commercial partnerships and develop technology in the fields of aerospace, defense, and security. The aim is to identify areas of cooperation and operative processes to launch specific projects.

Austrian Helicopters. In September 2020, Austria selected a military version of Leonardo's AW169 to replace aging 1960s-era helicopters. The program is worth about EUR300 million and will also cover logistics and training. Deliveries are scheduled to begin in 2022. Leonardo beat competing offers from Airbus' H145M and Bell's Model 429.

Avions de Transport Régional. This joint venture company produces the ATR 42/ATR 72 pressurized, twin-turboprop-powered, regional commuter transport aircraft. The joint venture consists of Airbus and Leonardo. In addition to marketing, sales, asset management, and customer support, the ATR consortium is in charge of engineering, certification, and airworthiness; flight testing; procurement; and final assembly. The manufacture of the ATR fuselage and

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wings remains subcontracted, respectively, to Leonardo and Airbus.

Website: www.atraircraft.com

BAE Systems. In June 2017, BAE Systems and Leonardo announced an initiative to pursue collaborations on new precision-guided solutions. The two companies anticipate offering new adaptations of Leonardo's Vulcano – a family of gun-launched munitions that exceeds the performance of currently available precision-guided projectiles – in a variety of gun systems, including the BAE Systems-built Advanced Gun System (AGS) and the Mk 45 naval gun.

In April 2017, Leonardo DRS and BAE Systems signed an MoU to offer advanced threat detection capabilities for U.S. Army fixed- and rotary-wing aircraft. The two companies will collaborate to develop an advanced infrared-based threat warning system to meet current and evolving operational requirements for Army aircraft survivability.

In July 2016, Leonardo and BAE Systems partnered on the Joint Avionics Solution (JAS) for the U.K.'s Typhoon fleet. The 10-year arrangement with the U.K. Ministry of Defence to support the avionics on the Typhoon is valued at more than EUR600 million. The JAS program is part of the Typhoon Total Availability Enterprise (TyTAN) initiative that aims to establish a European support model for the Typhoon, delivering improved support and cost savings for at least the next 10 years.

In November 2013, Leonardo and BAE teamed to provide electronic warfare operational support for Eurofighter Typhoon customers. EWOS is the combination of the mission support tools, processes, people, and training needed for EW operations.

Beth-El. In March 2015, Leonardo DRS signed a teaming agreement with Beth-El, a supplier of chemical, biological, radiological, and nuclear filtration products. The team will produce state-of-the-art environmental control and protection systems for combat vehicles and multiple types of shelters utilized in forward operating bases.

Bharat Electronics. In February 2009, Leonardo and Bharat Electronics Ltd of India signed an MoU to explore potential opportunities in the field of electronic warfare in the Indian market, including offset requirements and contract manufacturing for export markets.

Boeing. In September 2018, the team of Boeing and Leonardo won the U.S. Air Force's Huey Replacement Program with the companies' MH-139 helicopter (see **Program Activity** section below).

In February 2014, Boeing and Leonardo finalized a restructured contract for the 787 program. The contract establishes a new performance-based business arrangement that will drive improved operational performance for the 787 program as it ramps up production. Leonardo produces fuselage sections 44 and 46 for the 787 program at its Grottaglie plant and horizontal stabilizers in Foggia (both in Italy).

In June 2012, Boeing and Leonardo entered into a collaborative agreement in support of the Single European Sky ATM Research (SESAR) program's development phase. Under the agreement, Boeing would cooperate with Leonardo on research into flight data modeling and datalink communications for all phases of flight, as well as system-wide information management via an Internet-like system that enables information sharing across all stakeholders.

In early 2008, Boeing and Leonardo signed an MoU for joint work on the next-generation Chinook helicopter for the Italian Army. Under a \$1.22 billion order, the partners delivered 16 ICH-47F Chinooks.

CAE. In March 2021, Leonardo and CAE created a joint venture called Leonardo CAE Advanced Jet Training Srl to support the operations of the International Flight Training School (IFTS) in Italy. The joint venture will provide training support services, including full maintenance and operation of a fleet of 22 M-346 aircraft and its ground-based training system, as well as operation of IFTS base facilities. Construction on the center began in late 2020, and the IFTS will achieve operational readiness in 2022.

In September 2019, Leonardo and CAE USA joined forces to collaborate in the United States to offer integrated solutions for helicopter training requirements for the government market. The companies signed a Memorandum of Agreement (MoA) that expands on the long-established relationship between Leonardo and CAE in helicopter training. The MoA is focused on delivering tailored helicopter-and-training packages to U.S. government operators and Foreign Military Sales (FMS) customers.

Canada Future Aircraft Training. Launched in December 2018, the Future Aircrew Training (FAcT) competition aims to provide future pilot and aircrew training services for the Royal Canadian Air Force (RCAF). In 2019, Airbus, BAE Systems, and Sikorsky withdrew from the FAcT program. Three competitors remain: Babcock Canada, Leonardo Canada, and SkyAlyne Canada. A formal Request for Proposals and contract award are expected in 2021 and 2023, respectively.

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Canopy Technologies LLC. In September 2004, Leonardo DRS and Elliott Company Inc, a wholly owned subsidiary of Ebara Corporation, announced the formation of Canopy Technologies LLC to market high-performance integrated power systems for commercial and industrial applications. The Houston, Texas-based company focuses on industrial process electrification of rotating machinery applications and commercial products for industrial markets.

Changhe Agusta Helicopter. In September 2005, Leonardo set up an industrial collaboration with Jiangxi Changhe Aviation Industries Co, an AviChina company, establishing the Jiangxi Changhe-Agusta Helicopter Co Ltd (CAH) joint venture.

Cisco. In December 2013, Cisco and Leonardo announced a new agreement that would combine their complementary technology strengths in the defense and civil industries. The two companies would jointly create service offerings and solutions targeting the defense, security, and aerospace industries, as well as the emerging needs in "smart connected" cities and environments.

Clean Sky. Launched in 2008, Clean Sky is a European public-private research program focused on developing technology aimed at reducing CO₂, gas emissions, and noise levels produced by aircraft. The Clean Sky 1 effort has six focus areas: Green Regional Aircraft (led by Leonardo and Airbus), Smart Fixed Wing Aircraft (Airbus and Saab), Green Rotorcraft (Leonardo and Airbus), Sustainable and Green Engines (Rolls-Royce and Safran), Systems for Green Operations (Liebherr and Thales), and Eco-Design (Dassault Aviation and Fraunhofer-Gesellschaft). A larger Clean Sky 2 program was launched in 2014 and will run through 2024. The Sky 2 program is studying improvements to large passenger aircraft, regional aircraft, fast rotorcraft, airframes, engines, systems, small air transport, and eco-design.

Website: <https://www.cleansky.eu/>

CODALTEC. In December 2019, Leonardo and CODALTEC (Corporacion de alta tecnologia para la defensa) signed a Memorandum of Understanding under which the two organizations will work together to identify potential projects and business opportunities in Colombia. As part of the agreement, the companies will promote air defense systems, C4I solutions, cybersecurity, and national infrastructure protection systems for Colombia.

Codemar. In April 2019, Leonardo signed an MoU with Brazilian company Codemar that promotes socio-economic development in the prefecture of Maricá. The two companies will seek to develop the prefecture's

industrial base by offering opportunities to improve its technological expertise; under one joint undertaking, Leonardo and Codemar could develop a helicopter maintenance hub at Maricá airport.

Collins Aerospace. In March 2015, Rockwell Collins (now Collins Aerospace) and Leonardo DRS Training and Control Systems established a partnership to provide next-generation secure air combat training capability for both domestic and international air forces. The delivered capability will leverage newly developed security and instrumentation technologies from the Common Range Integrated Instrumentation System (CRIIS) with existing air combat training, weapon simulation, and aircraft integration experience. The Joint Secure Air combat training System (JSAS) includes certified Multiple Independent Levels of Security (MILS) architecture and a higher throughput datalink than the current-generation systems offer. The JSAS solution will provide for scalable use, from small "squadron-level" training to large-force exercises (such as Top Gun or Red Flag with over 100 aircraft), maximizing the training realism for each participant

D-Flight. In February 2019, a grouping of companies led by Leonardo, in partnership with Telespazio and IDS (Ingegneria Dei Sistemi), subscribed a share capital increase of D-Flight. D-Flight is the company ENAV created to develop the U-space platform, which provides Unmanned Aerial Vehicles Traffic Management (UTM) services. ENAV holds 60 percent of D-Flight's capital, and 40 percent will be held by the grouping formed by Leonardo, Telespazio, and IDS.

Website: <https://www.d-flight.it/web-app/>

Diehl. In June 2012, Diehl Defence and Leonardo agreed to collaborate in the field of large-caliber conventional and guided ammunition. Initially, the effort focused on Vulcano 155mm GPS/SAL long-range precision-guided ammunition for the PzH 2000 and Vulcano ammunition for Leonardo 127/64 lightweight naval guns.

DRS Sonar Systems. In April 2007, Leonardo DRS and Thales North America formed a new joint venture company, DRS Sonar Systems LLC. The company manufactures undersea warfare products and systems under license from Thales and serves as the point of contact for sales and support in the United States. The company also develops underwater systems tailored to U.S. Navy requirements by integrating subsystems from other contractors and Thales' extensive product base.

In January 2011, DRS Sonar Systems acquired Advanced Acoustic Concepts Inc, a privately held company headquartered in Hauppauge, New York. The combined company now conducts business as Advanced

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Acoustic Concepts LLC, a DRS/Thales Company. AAC is a provider of sonar systems, sonar signal processing, acoustic training systems, and open architecture system and software integration.

Elettronica. Leonardo holds a 31.33 percent stake in this firm, which produces surveillance, self-defense, and electronic warfare systems.

Website: <https://www.elc-roma.com>

Enaer. In March 2015, Leonardo and Enaer (Empresa Nacional de Aeronáutica de Chile) signed an MoU under which the two companies will collaborate on logistics support of the C-27J and on a new high-efficiency trainer, the M-345.

In March 2008, Leonardo and Enaer signed an MoU that outlined the terms of a partnership for programs related to the M-346 and M-311 trainer aircraft. Under the terms of the MoU, the companies agreed to jointly manufacture and sell M-346 and M-311 aircraft in Latin America for basic, advanced, and lead-in fighter training and for the operational role of close air support.

Eurofighter GmbH. Eurofighter GmbH, based in Hallbergmoos, Germany, was the consortium set up in 1986 to manage development and production of the complete Eurofighter Typhoon weapon system. It is now owned by three partner companies: Airbus Defence & Space, 46 percent; BAE Systems, 33 percent; and Leonardo, 21 percent. BAE is responsible for the aircraft's forward fuselage and foreplanes, and shares airfoil production with Leonardo and Airbus (CASA).

Website: <https://www.eurofighter.com>

Belgian Fighter Replacement. In October 2018, Belgium selected the F-35 as the replacement aircraft for its F-16 fleet. The company faced a competing offer from the Eurofighter consortium with the Typhoon. Dassault Aviation did not officially submit the Rafale, but instead was looking for a government-to-government deal that will offer the fighter directly. Belgium plans to buy 34 F-35A aircraft in a deal valued at around EUR4 billion. Deliveries are expected to start in 2023.

Canadian Fighter Replacement. In February 2018, Canada announced that five manufacturers will be invited to bid to provide the replacement for Canada's Boeing F/A-18, currently in service. The list initially included Boeing, Lockheed Martin, Airbus (with the Eurofighter), Saab, and Dassault. However, by year-end 2018, Dassault had withdrawn from the competition. Airbus' withdrawal of the Eurofighter followed in September 2019. In July 2020, Saab,

Lockheed Martin, and Boeing submitted proposals to Canada's Future fighter capability project.

HX Competition. In October 2015, Finland launched its HX program to identify a successor for its F/A-18 Hornets. Finland seeks a multirole jet fighter to introduce into service on a rolling basis as it begins phasing out its Hornets in 2025. Competitors for the requirement include Boeing's F/A-18E/F Super Hornet, Lockheed Martin's F-35 Lightning II, the Eurofighter Typhoon, Dassault Aviation's Rafale, and Saab's Gripen E and dual-seat Gripen F. These five contenders submitted initial proposals in February 2019 and were asked for best and final offers in January 2021. Finland has approved EUR9.4 billion for the program. A test and evaluation event dubbed the HX Challenge began in early 2020. A winner is expected to be selected in 2021, with the new aircraft to enter service in 2025.

Euromids SAS. This joint venture between Indra, Hensoldt, Leonardo, and Thales designs, develops, and produces radio terminal units. Notable products include the Multifunctional Information Distribution System-Low-Volume Terminal (MIDS-LVT).

Euro radar. This consortium was created in 1990 to design, develop, and produce the advanced Captor radar (formerly ECR-90) for the Eurofighter Typhoon. Euro radar is led by Leonardo and includes Airbus and Indra.

EUROSONAR. This consortium offers Helicopter Long Range Active Sonar (HELIRAS) as the basis of the SONICS system for the four-nation (France, Germany, Italy, and the Netherlands) NH90 helicopter. EUROSONAR was initially led by Leonardo and included L3Harris Technologies' ELAC Nautik of Germany, SP Aerospace of the Netherlands, Fokker Elmo of the Netherlands, and L3Harris Technologies – Ocean Systems. Additional subcontractors would provide the technology to add sonobuoy capability to the NH90 SONICS system.

EuroTorp. The EuroTorp consortium markets MU-90 Impact lightweight torpedoes and A-244/S lightweight torpedo systems in France and Italy, as well as internationally. These systems have been selected for French and Italian ships, helicopters, and maritime patrol aircraft. France, Italy, and Germany have jointly ordered some 800 MU-90 Impact torpedoes. EuroTorp was formed by Leonardo (50 percent), Naval Group (26 percent), and Thales Underwater Systems (24 percent).

Hoverfly. In October 2020, Leonardo DRS entered into a strategic partnership with Hoverfly Technologies Inc of Orlando, Florida, to manufacture HTI's line of

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Tethered Unmanned Aerial Systems (TUAS). The Leonardo DRS Land Systems business in St. Louis, Missouri, has since received its first order from Hoverfly, valued at over \$4 million. Under terms of the agreement, Leonardo DRS will produce serial quantities of Hoverfly's LiveSky TUAS.

Website: <https://hoverflytech.com>

IMOTHEP Project. Announced in January 2020, the IMOTHEP project (Investigation and Maturation of Technologies for Hybrid-Electric Propulsion) is a European effort to develop a roadmap for hybrid-electric propulsion for commercial aircraft. France's aerospace research agency, Onera, leads the effort. The project involves aircraft manufacturers Airbus and Leonardo and engine manufacturers Safran, GE Avio, MTU, ITP, and GKN, as well as many universities throughout Europe. Under the European Commission's Horizon 2020 Research and Innovation program, the effort received a four-year, EUR10.4 million grant to investigate various technologies.

Website: <https://www.imothep-project.eu/>

Intermarine. In June 2020, Leonardo and Intermarine signed a strategic research and development agreement on new technologies. The collaboration also aims to pursue business opportunities in the military and paramilitary naval market. Additionally, the 10-year industrial relationship will focus on new generation programs, minesweeper fleet renewal, fast patrol boats, and hydrographic vessels. Intermarine is an Italian shipyard that designs and manufactures military and civilian ships as well as naval systems and components.

General Electric. In January 2019, Leonardo DRS extended its LM2500 Gas Turbine packaging supply agreement with GE's Marine Solutions through the end of 2024, with an option to extend it through 2029. This agreement covers the manufacture of GE-designed LM2500 packages for U.S. Navy and selected international platforms. For the three LM2500 engine sizes (LM2500, LM2500+, and LM2500+G4), Leonardo DRS provides the baseplate; enclosure; and a fully instrumented, wired, and piped package to meet customer turbine start and fire protection systems. Leonardo DRS began packaging the engines with GE in 2011.

Global Military Aircraft Systems. Formed in 2005, this is a venture between Leonardo and L3Harris. GMAS focuses on developing the C-27J cargo aircraft.

GTDAR. The GTDAR consortium is producing the Airborne Multirrole Solid-state Active-array Radar (AMSAR). This organization is composed of Leonardo, Airbus, and Thales.

Hanwha. In October 2017, Leonardo and Hanwha signed an MoU to jointly provide avionics and mission systems for the Republic of Korea and other international customers. Under the agreement, the two companies will initially work together to develop and deliver targeting systems. As part of the teaming, Leonardo plans to localize parts of sensor production with Hanwha Systems in South Korea and will help develop the company's capabilities in a number of areas of advanced technology.

Havelsan. In June 2014, Leonardo and Havelsan signed an MoU to jointly market and sell their complementary training products and capabilities. Turkey's Havelsan is a supplier of simulation and synthetic training systems and information management solutions.

Hensoldt. In March 2017, Leonardo signed an MoU with Hensoldt (the name for Airbus DS Electronics and Border Security following its spin-off) to offer Mode 5 IFF solutions to customers around the world.

In July 2016, Leonardo, partnered with Hensoldt as "Team Skytale," was chosen as the preferred bidder by the U.K. Ministry of Defence to upgrade the IFF systems on more than 400 operational platforms spanning land, air, and sea. A GBP260 million contract for the production of over 350 systems was signed in May 2017. In 2020, the U.K. was to switch over to the new Mode 5 IFF standard, being introduced by NATO.

IGG. In November 2019, Leonardo and IGG (International Golden Group PJSC) signed a Memorandum of Understanding aimed at analyzing and exploring the development of joint business activities in the United Arab Emirates. The two firms are specifically looking to collaborate in physical and cybersecurity, C4I, naval systems, guided ammunitions, target drones, and fire control systems business development.

IMPACT. In June 2014, Leonardo and the International Multilateral Partnership Against Cyber Threats (IMPACT), a partner of the United Nations' International Telecommunications Union (ITU), signed an MoU to work together on strategic initiatives that will boost international defenses against cyberattacks. The agreement will see Leonardo and ITU-IMPACT exchange information regarding cyber threats and vulnerabilities, as well as engage in joint capacity-building activities.

Kairos Autonomi. In October 2012, Leonardo DRS teamed with Kairos Autonomi Inc to jointly market and produce autonomous and semi-autonomous moving

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land targets for use in advanced aircraft training. The partnership will leverage the Kairos Pronto4 Robotic Appliqué Kit operate-by-wire technology, which converts manned vehicles into optionally unmanned vehicles with the ability to operate by teleoperation or semi-autonomously or autonomously.

LIATEC. In April 2007, Leonardo signed an agreement with the Libyan government to create a joint venture in the sector of electronics for defense and security. Leonardo agreed to contribute its technological expertise in collaboration with local industry. The aim of the venture was to develop integrated critical infrastructure surveillance systems, telecommunications and homeland security systems, and integrated postal automation systems for better penetration into African markets. Leonardo already had an industrial presence in Libya. In January 2006, it signed an agreement – through its subsidiary AgustaWestland – with Libyan Company for Aviation Industry to create a joint venture (Libyan Italian Advanced Technology Co, or LIATEC) to engage in aeronautics activities and develop security systems. In April 2010, LIATEC and AgustaWestland opened a new helicopter final assembly facility at Abu Aisha airport, 60 kilometers south of Tripoli.

LIG Nex1. In November 2018, Leonardo was selected by the Republic of Korea-based company LIG Nex1 as a strategic technology partner. The two companies will initially bid together to carry out the South Korean Defense Acquisition Program Agency's IFF upgrade requirement. This will see the IFF equipment on aircraft operated by ROK armed forces updated to the latest Mode 5 standard.

Lithiumstart. In December 2014, Leonardo DRS Power and Control Technologies signed a Memorandum of Agreement with Lithiumstart, a supplier of scalable lithium-ion and super-capacitor-based energy storage systems, to integrate technologies into high-power military and commercial energy storage applications.

MALE RPAS. In September 2016, a definition study began under the European MALE (EuroMALE) RPAS (Medium Altitude Long Endurance Remotely Piloted Aircraft System) effort. The MALE2020 partners referred to this effort as "MALE2025" due to delays, but they now call it the Future European MALE or the European Medium Altitude Long Endurance Remotely Piloted Aircraft System (MALE RPAS). Industry representatives from France, Germany, and Italy – Dassault Aviation, Airbus, and Leonardo, respectively – will have an equal share in the work.

The main purpose of the study is threefold: to identify a set of achievable operational capabilities, to define the corresponding set of system requirements, and to

perform preliminary design activities to allow the launch of a potential development and production phase with minimum residual risk. The first full-scale model of the MALE RPAS was unveiled in April 2018 at the ILA Berlin Air Show. In November 2018, the Czech Republic joined the MALE RPAS team. Aero Vodochody is expected to lead the nation's involvement in the program.

In May 2019, Airbus submitted its offer, but the contract signing slipped from 2019 to 2020 and now early 2021, thanks to COVID-19. A total of 20 systems, each consisting of three UAVs, will be delivered. First flight is scheduled for 2025, with initial deliveries to follow in 2028.

Website: <http://www.occar.int/programmes/male-rpas>

MBDA. In April 2001, BAE Systems, Airbus, and Leonardo signed an agreement to incorporate a single company that would regroup the missile systems activities of their respective subsidiaries – Matra BAE Dynamics, EADS Aerospatiale Matra Missiles, and Alenia Marconi Systems (AMS) – into a new company named MBDA Missile Systems. Final documents formally establishing MBDA as a legal operating entity were signed in Paris, France, on December 18, 2001. The economic interests of the partners in MBDA are as follows: BAE Systems, 37.5 percent; Airbus, 37.5 percent; and Leonardo, 25 percent. (See "MBDA" report in this service for details.)

Website: <https://www.mbda-systems.com>

MIDCAS. In June 2009, the MIDCAS consortium, comprising 13 European companies (including several Leonardo business units), was awarded a contract by the European Defense Agency on behalf of the EDA's member countries (France, Germany, Italy, Spain, and Sweden, with the latter as the lead country for the project) to supply a midair collision-avoidance system (MIDCAS). The four-year contract was worth around EUR50 million. Under the contract, a sense-and-avoid system was to be built that could identify and prevent potential midair collision threats to remotely piloted aircraft systems. Flight test demonstrations were conducted in 2015. A contract for the Enhanced RPAS Automation (ERA) project was signed in 2016.

NGL Prime SpA. In February 2005, Airbus Defence and Space and Leonardo concluded a preliminary agreement to create a venture to manage development and construction of future launch systems. The operation – dubbed NGL Prime SpA – was initially owned 70 percent by Airbus Defence and Space and 30 percent by Leonardo. In June 2007, NGL Prime SpA signed two contracts with the European Space Agency – one to define launcher system concepts for the European

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Next-Generation Launcher and the other to develop a European Intermediate Experimental Vehicle, or IXV. The contracts had a total value of EUR20.5 million.

NH Industries. Formed in 1992, NH Industries is the designer and manufacturer of the NH90 multirole military helicopter for NATO forces. The joint company is composed of Airbus Helicopters (62.5 percent), Leonardo (32 percent), and GKN Fokker Aerostructures (5.5 percent).

Website: <http://www.nhindustries.com>

NIMR Automotive. In June 2012, Leonardo DRS signed an agreement with Tawazun Holding's NIMR Automotive of the United Arab Emirates to collaborate on the advancement of NIMR Automotive's line of tactical wheeled vehicles in order to ensure the vehicles are equipped to deliver effective C4ISR solutions in areas such as local situational awareness, vehicle and tactical communications, health and usage monitoring, and battle management.

Northrop Grumman. In February 2012, Leonardo, together with its partner Northrop Grumman, was awarded a contract by the NATO Consultation, Command and Control (NATO C3) agency to develop, implement, and support the NATO Computer Incident Response Capability (NCIRC). The contract, worth around EUR50 million, was for a service that would provide information assurance to around 50 NATO sites and headquarters in 28 countries worldwide. The NCIRC would provide the capability to detect and respond to cybersecurity threats and vulnerabilities rapidly and effectively.

In June 2011, Northrop Grumman and Leonardo signed an MoU to jointly pursue the international Directed Infrared Countermeasures (DIRCM) market. The document further strengthened the existing DIRCM strategic alliance and enabled the two companies to aggressively target the "rest-of-the-world" DIRCM marketplace. Earlier, in July 2006, the two firms signed a Strategic Alliance Agreement to further strengthen their collaboration in the manufacture and sale of Northrop Grumman DIRCM systems, including the AAQ-24(V) Nemesis and Guardian.

O2. In February 2021, Leonardo's Edinburgh, Scotland-based Innovation and Technology Incubator Centre announced that it will partner with O2 (Telefónica UK) to investigate several applications of private 5G technology in the defense and security industry. Proposed uses of secure, high-bandwidth mobile data include facilitating next-generation "future factory" manufacturing capabilities and providing high-speed and secure information services.

Orizzonte Sistemi Navali SpA. In October 2002, Fincantieri (51 percent) and Leonardo (49 percent) reached an agreement to transform the jointly owned Orizzonte SpA, which was created to manage the Orizzonte (Horizon) frigate program for the Italian Navy, into a naval systems company. The company now designs and develops high-tech surface ships and sells them in the domestic and overseas markets. The ships include corvettes, frigates, destroyers, and aircraft carriers of over 1,000 tonnes. Orizzonte Sistemi Navali is based in Genoa, Italy.

Website: <http://www.orizzontesn.it/en/>

Panavia Aircraft GmbH. BAE Systems (42.5 percent), Airbus Defence and Space (42.5 percent), and Leonardo (15 percent) established this consortium in 1969 to design, develop, and produce the Tornado multirole combat aircraft. The trinational Tornado production program is complete, with approximately 992 aircraft delivered over its lifetime. Panavia and its partner companies are jointly conducting a midlife update program and combat effectiveness improvement program for the entire Tornado fleet to ensure the operational effectiveness of the aircraft beyond 2020.

Website: <https://www.panavia.de/>

Paramount Group. In September 2018, Leonardo and the Paramount Group signed a letter of intent (LOI) to evaluate a cooperation for the development of an armed M-345 jet trainer for the African market. Leonardo might also seek the involvement of Paramount in the SF-260 program and its Logistic Support services.

PGZ. In September 2016, Leonardo and Poland's Polska Grupa Zbrojeniowa SA (PGZ) signed an LOI for a long-term strategic partnership in the defense and security market. Under the agreement, Leonardo will support PGZ with its technology and products, and PGZ will cooperate with Leonardo on industrial and logistics support activities. Areas of focus include rotary-wing platforms and services, land systems, naval systems, unmanned aircraft, and fixed-wing systems and services, as well as space technologies.

Polish Attack Helicopters. In November 2014, several competitors were announced for Poland's requirement known as the Kruk attack helicopter project – for 30 attack helicopters to replace the Polish Army's fleet of aged Mil Mi-24s. Competitors were expected to include Airbus Helicopters' Tiger, Bell's AH-1Z Viper, Boeing's AH-64 Apache, Leonardo Helicopters' AW249, and Turkish Aerospace Industries' T129 ATAK.

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Polish Defense Holding. In September 2013, Polish Defense Holding and Leonardo signed an MoU to strengthen their collaboration in the aerospace, defense, and security sectors in both Polish and international markets. The two companies, through Bumar Labedy and PCO SA (Polish Defense Holding) and Leonardo, had already cooperated on the Rosomak program for armored vehicles. This new MoU would look for opportunities in helicopters, defense systems, and space systems.

Polish Helicopters. In May 2020, Poland issued a requirement for 32 light multirole helicopters under its Perkoz program. This latest effort seeks to replace aging Soviet-era Mi-2 helicopters currently in service. Leonardo is proposing a military variant of its AW139. Other competitors that are expected to bid on the effort include Airbus Helicopters, Bell, Boeing, Elbit, Sikorsky (via PZL Mielec), and Hindustan Aeronautics, among others. A report on www.Defence24.pl said that the Perkoz program had been suspended in April 2021.

In March 2017, Poland began reviewing submissions for its anti-submarine warfare (ASW) and special forces helicopter requirements. Leonardo, via its Polish subsidiary PZL-Swidnik, was in competition with Sikorsky (via PZL Mielec) to provide ASW and special forces helicopters. Poland plans to acquire eight special forces helicopters and an undetermined number of ASW aircraft (news reports have said eight), which will be determined by price. In December 2018, Airbus pulled out of the competition due to offset requirements.

In April 2019, Leonardo was selected and signed a EUR380 million contract to supply four AW101s and a comprehensive integrated logistics and training package to the Polish Ministry of National Defense. Leonardo's PZL-Świdnik subsidiary will act as the prime contractor and be responsible for the entire contract execution.

Project LAND 2097 Phase 4. The Australian Department of Defence has initiated Project LAND 2097 Phase 4, calling for the acquisition of light helicopters to support special operations. A Request for Proposals for the program was issued in February 2020 for 20 rotorcraft. The contract has an estimated value of about \$1.8 billion. In September 2018, Australia's Department of Defence issued a Request for Information calling for helicopters optimized for operating in dense urban environments that can be deployed by C-17 strategic airlifters. Australia seeks commencement of deliveries in 2023 if a contract comes to fruition. Each helicopter must be fitted with usable, proven ISR and weapons systems. Bell's 429 has been chosen by two competitors: Babcock Australia and Hawker Pacific. Other competitors are likely to include Airbus Helicopters' H145M, Boeing's AH-61 Little Bird, and Leonardo Helicopters' AW109.

Rafael. In October 2012, Leonardo DRS and Rafael teamed to jointly market and develop advanced hostile fire detection and active protection capabilities for the U.S. ground systems market. Initially, the companies will focus on the TROPHY-HV hard-kill active protection system, which neutralizes modern anti-armor threats (including all anti-tank rockets and guided missiles) and tank-fired high-explosive anti-tank rounds. In June 2018, Leonardo DRS was awarded a U.S. Army contract worth \$193 million to provide TROPHY systems, countermeasures, and maintenance kits for U.S. Army tanks. A second contract for \$79.6 million – that could be worth as much as \$200 million – was awarded in January 2019.

Roboteam. In May 2016, Leonardo DRS signed a strategic teaming agreement with Roboteam Ltd to develop a solution for the U.S. Army's emerging Common Robotic System-Individual (CRS-I) program. The CRS-I will provide the dismounted warfighter with the capability to conduct lower-level reconnaissance, surveillance, and target acquisition.

Rolls-Royce. In May 2002, Leonardo and Rolls-Royce modified their holdings in Europea Microfuzioni Aerospaziali SpA (EMA), their joint venture based in Morra De Sanctis in Irpinia (southern Italy), to strengthen EMA's presence in international markets for advanced turbine components. Rolls-Royce increased its shareholding in EMA from 33.33 percent to 51 percent, and the Leonardo holding was reduced from 66.66 percent to 49 percent. EMA manufactures turbine blades and vanes for aero engines and components for RB211-524, RB211-535, and Rolls-Royce Turbomeca Adour engines.

Website: <https://www.emaht.com>

Rotorsim. Formed in 2003, this is a joint venture equally owned by Leonardo and CAE that offers simulator and training solutions across the entire range of Leonardo helicopters. The consortium is based in Sesto Calende, Italy.

RTI Consortium. Formed in October 2014, Raggruppamento Temporaneo di Impresa consists of Fincantieri and Leonardo. RTI was tasked with building seven multirole offshore patrol vessels – Pattugliatori Polivalenti d'Altura (PPA) – for the Italian Navy in July 2015. The delivery of the logistic support unit occurred in June 2019, while the first patrol vessel is expected to be delivered in 2021. The delivery of the following patrol vessels is planned for 2022, 2023, 2024 (two units), and 2025.

Russian Technologies. In November 2008, Leonardo and Russian Technologies signed an

Leonardo

agreement to establish a number of joint ventures in Russia to manufacture carbon-fiber components.

Saab. In January 2016, Leonardo and Saab signed an MoU to provide EW systems support to customers of Saab's Gripen, among others.

SEA 129-5. The Royal Australian Navy's SEA 129 Phase 5 program aims to provide its warships with a new UAV capability. In March 2021, five competitors were shortlisted for the first requirement: BAE Systems Australia, Insitu Pacific, Northrop Grumman Australia, Raytheon Australia, and Textron Systems Australia. Leonardo is teamed with Northrop Grumman to offer the AWHero UAV for the competition. According to a report in *Australian Defence Magazine*, the Sea 129 Phase 5 program has three blocks: Block 1 includes seven "bricks" to be operated from the Arafura class OPVs and ANZAC class frigates; Block 2 will expand the capability to other ship classes from 2029; and Block 3 will update all systems from 2034.

Skydweller Aero. In November 2019, Leonardo invested in Skydweller Aero Inc, a U.S./Spanish start-up specializing in large-scale solar-powered unmanned air systems. The initiative will result in the development and deployment of the Skydweller drone, a fully electric unmanned aircraft capable of carrying large payloads with unlimited range and ultra-persistent endurance. Leonardo Aircraft will participate in development and engineering activities via a dedicated team.

The first phase focuses on converting the aircraft from a manned platform into an optionally piloted vehicle (OPV) by integrating advanced autonomy algorithms and vehicle management systems. The second step of the project will culminate in the first production aircraft, designed solely for unmanned operations and hardened against a range of environmental conditions. Autonomous flights of the OPV were projected for 2020, and the first production model of the unmanned version of the aircraft is expected to appear in 2021.

Website: <https://skydweller.aero/>

Stryker Medium Caliber Weapons System. In May 2019, the U.S. Army awarded five companies \$150,000 design integration contracts under its Stryker Medium Caliber Weapons System (MCWS) lethality program. The contractors include General Dynamics Land Systems, Kollsman, Leonardo DRS, Raytheon, and Pratt & Miller Engineering and Fabrication. A sixth contract to EOS Defense Systems USA was awarded in June following a protest by the company. According to a report on *Breaking Defense*, at least two unnamed competitors had left the competition as of June 2020. The second phase will be an open competition to award

a production contract. The Army plans to field up-gunned Strykers in 2022.

SuperJet International. In 2007, Alenia Aeronautica and Sukhoi formed a joint venture, SuperJet International (Alenia Aeronautica, 51 percent; Sukhoi, 49 percent), for the marketing, sale, and delivery of the Superjet 100 to the Western market. SuperJet International also provides worldwide aftermarket support. In addition, SuperJet International, headquartered in Italy, is responsible for design and development of the aircraft's VIP and cargo versions.

In 2017, Leonardo reduced its stake in SuperJet International to 10 percent. The operation is now 90 percent owned by Russia's United Aircraft Corp via its Sukhoi unit.

Website: <https://www.superjetinternational.com>

Team Cormorant. In June 2017, Leonardo Helicopters and IMP Aerospace & Defense (IMP) announced the addition of three key Canadian industrial partners to Team Cormorant to support Canada's CH-149 Cormorant midlife upgrade program. Leonardo Helicopters is the original equipment manufacturer of the EH101 and AW101 helicopters, while IMP will serve as the prime contractor for Cormorant in-service support. New team members include CAE, GE Canada, and Collins Aerospace in Canada. CAE will provide its training systems integration capability; GE Canada is the OEM for the T700-T6A1 engines in the Cormorant and for the CT7-8E engines installed on the AW101-519 helicopters; and Collins Aerospace will provide its Cockpit Display System. The upgrade program has an estimated value of CAD1.5 billion.

In May 2018, Leonardo was selected for the upgrade program. In August 2019, Canadian officials announced the fleet will receive two additional helicopters at a minimum, while the existing fleet will be upgraded to extend its life to at least 2042.

Team Tempest. Led by BAE Systems and including Leonardo, MBDA, Rolls-Royce, and the RAF's Rapid Capabilities Office, this team is developing the Tempest concept for the U.K.'s Future Combat Air effort. The British MoD's aim is to develop a sophisticated future fighter to replace the RAF's Eurofighter fleet in the 2040s, at which time they will serve alongside the F-35 Lightning II combat aircraft. The Team Tempest joint program office will spearhead development of a new design by 2025. This phase will be underwritten by GBP2 billion (\$2.6 billion) in funding technology originally committed under the 2015 Strategic Defence and Security Review (SDSR).

Leonardo

According to government and industry officials, the Tempest aircraft is necessary to sustain the U.K.'s combat aerospace sector. The Tempest is intended to enter service around 2035, replacing the Eurofighter Typhoon. A full-scale model of the Tempest was shown at the 2018 Farnborough Air Show. In September 2019, the partners signed a Statement of Intent that will see the parties work together to define a concept and partnership model. In July 2020, the U.K. selected seven other companies to support Team Tempest: Bombardier Belfast, Collins Aerospace Systems, GE Aviation UK, GKN Aerospace, Martin-Baker, Qinetiq, and Thales UK.

In July 2020, Italy and Sweden entered into formal discussions with the U.K. on the program. The new trilateral framework sees industry from the three nations collaborating on the research and development effort. The three national industries comprise companies from the U.K. (BAE Systems, Leonardo UK, Rolls-Royce, and MBDA UK), Italy (Leonardo Italy, Elettronica, Avio Aero, and MBDA Italia), and Sweden (Saab and GKN Aerospace Sweden).

Website: www.raf.mod.uk/what-we-do/team-tempest/

Telespazio. Telespazio was created in July 2005, held 67 percent by Leonardo and 33 percent by Thales. The operation originally combined Telespazio with the activities of (then) Alcatel Space Services and Operations. It concentrates on satellite solutions, including the control and exploitation of space systems. Headquartered in Rome, Italy, with plants in Italy, France, and Germany, the company has about 1,400 employees.

In April 2007, Thales acquired Alcatel's shareholdings in Alcatel Alenia Space and Telespazio. Through the transaction, Thales acquired Alcatel's 67 percent shareholding in Alcatel Alenia Space (renaming it Thales Alenia Space) and 33 percent shareholding in Telespazio.

Website: <https://www.telespazio.com>

TH-XX. In January 2019, the U.S. Naval Air Systems Command (NAVAIR) issued a Request for Proposals for the procurement of new TH-XX helicopter training aircraft. The new TH-XX aircraft will replace some 130 Bell TH-57B/C Sea Rangers currently in service. Competitors included Leonardo with the TH-119, Bell

Helicopter's 407GX, and Airbus' H135. In January 2020, Leonardo was selected as the winner with a \$176.5 million contract for an initial batch of 32 helicopters. The helicopter will be designated TH-73A in U.S. Navy service (see **New Products and Services**).

Thales. In November 2007, Leonardo and Thales teamed to conduct a maritime safety and security project for European maritime areas under the framework of a common initiative called SEASAME. This joint initiative offers perspectives and solutions for the optimized development of maritime activities, such as sea transport that is respectful of environmental matters.

Thales Alenia Space. This joint venture was formed in July 2005 by combining the activities of Alcatel Space (now Thales) and Alenia Spazio. Thales held 67 percent and Leonardo, 33 percent. The operation focuses on the design, development, and manufacture of space systems, including satellites and payloads, for civilian and military applications. In April 2007, Thales acquired Alcatel's shareholdings in Alcatel Alenia Space and Telespazio and renamed the operation Thales Alenia Space. Operational headquarters are in Cannes, France, with plants in Belgium, France, Italy, and Spain.

Website:

<https://www.thalesgroup.com/en/global/activities/space>

U.K. New Medium Helicopter (NMH). In February 2021, the U.K.'s *Defence Command Paper* revealed requirements for a new medium-lift helicopter that will enable a consolidation of the disparate fleet of medium-lift helicopters from four platform types to one, including the replacement of a fleet of 23 Pumas. The RAF plans to retire its Pumas in 2025. Competitors may include Leonardo's AW149, Airbus' H175, Sikorsky's UH-60, NH Industries' NH90, Boeing's Grey Wolf, and Bell's 525 Relentless.

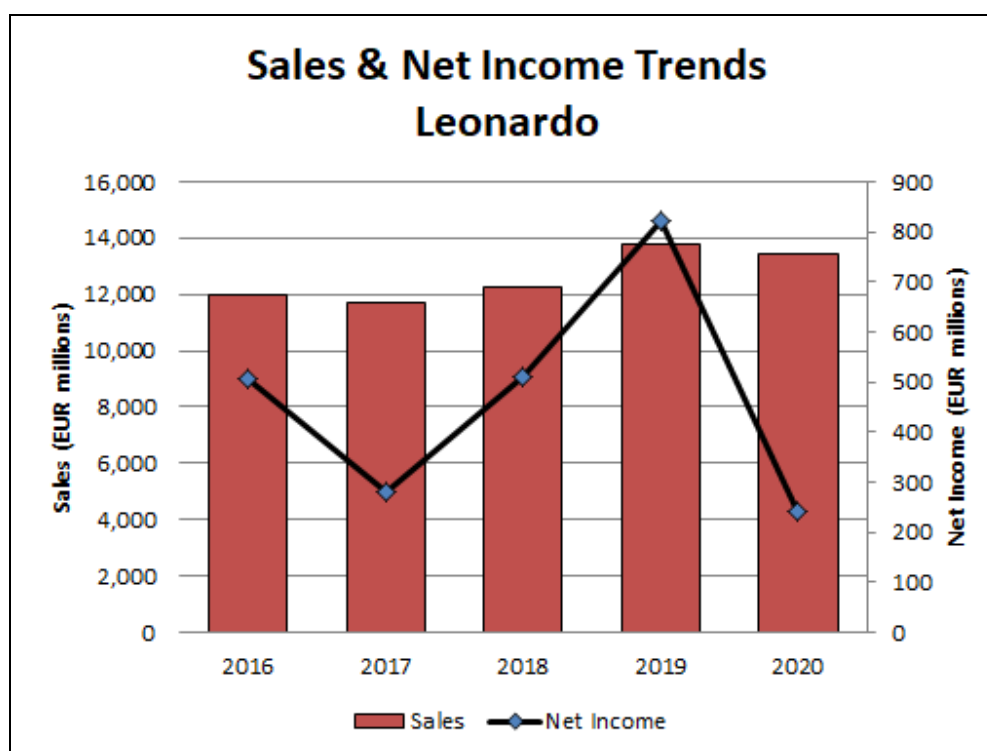
UKSAR2G. The Second Generation Search & Rescue Aviation Program (UKSAR2G) is an upcoming program to address the U.K. Maritime Coastguard Agency's SAR services. Since 2013, the UKSAR helicopter service has been delivered by Bristow Helicopters with a mix of Leonardo Helicopters AW189s and Sikorsky S-92s at 10 coastal bases. Competitors are expected to include Airbus, Leonardo, and Sikorsky. A Request for Proposals is expected in late 2021, with a contract to be awarded in late 2022.

Leonardo**Financial Results/Corporate Statistics**

For 2020, Leonardo posted sales of EUR13.4 billion, down almost 3 percent from sales of EUR13.8 billion in 2019. The company reported net income of EUR243 million, compared with EUR822 million for 2019. Figures have been restated to the company's current presentation. U.S. dollar figures (in millions) are translated as of December 31, 2020, at the rate of EUR1 = USD1.22824.

Leonardo (Milan:LDO)

(EUR millions)	2016	2017	2018	2019	2020	(USD) 2020
Net Sales	12,002	11,734	12,240	13,784	13,410	16,471
Net Income	507	279	510	822	243	298
New Orders	19,951	11,595	15,124	14,105	13,754	16,893
R&D Expenditures	1,373	1,539	1,440	1,525	1,646	2,022
Backlog	34,798	33,507	36,118	36,513	35,516	43,622
Long-Term Debt	4,011	3,265	3,423	3,975	3,880	4,766
Shareholder Equity	4,097	4,213	4,510	5,334	5,278	6,483
Debt-to-Equity Ratio	.97	.77	.75	.75	.74	-
Employees	45,631	45,134	46,462	49,530	49,882	-

**Industry Segments**

The following is a breakdown of Leonardo's sales by selected major market segment for the past five years. The removal of Space sales was due to the adoption of new accounting rules (IFRS 11), which led to the deconsolidation of the joint ventures from sales.

Leonardo

The Defense Electronics & Security segment includes the Land and Naval Defense Electronics Division, Airborne and Space Systems Division, Security and Information Systems Division, Defense Systems Division, and Leonardo DRS.

Aeronautics includes the Aircraft and Aerostructures divisions.

SALES	2016	2017	2018	2019	2020
(EUR millions)					
Helicopters	3,639	3,438	3,810	4,025	3,972
Defense Electronics & Security	5,468	5,550	5,953	6,701	6,525
Aeronautics	3,130	3,093	2,896	3,390	3,393
Other	327	338	340	463	407
Eliminations	-562	-685	-759	-795	-887
TOTAL	12,002	11,734	12,240	13,784	13,410
OPERATING INCOME (EBITA*)	2016	2017	2018	2019	2020
(EUR millions)					
Helicopters	430	281	359	431	383
Defense Electronics & Security	558	537	522	613	537
Aeronautics	347	311	328	362	200
Space	77	72	58	39	23
Other/Eliminations	-160	-124	-147	-194	-205
TOTAL	1,252	1,077	1,120	1,251	938

Segment Details

Below is a breakdown of key financial data for Leonardo's major business and geographic segments.

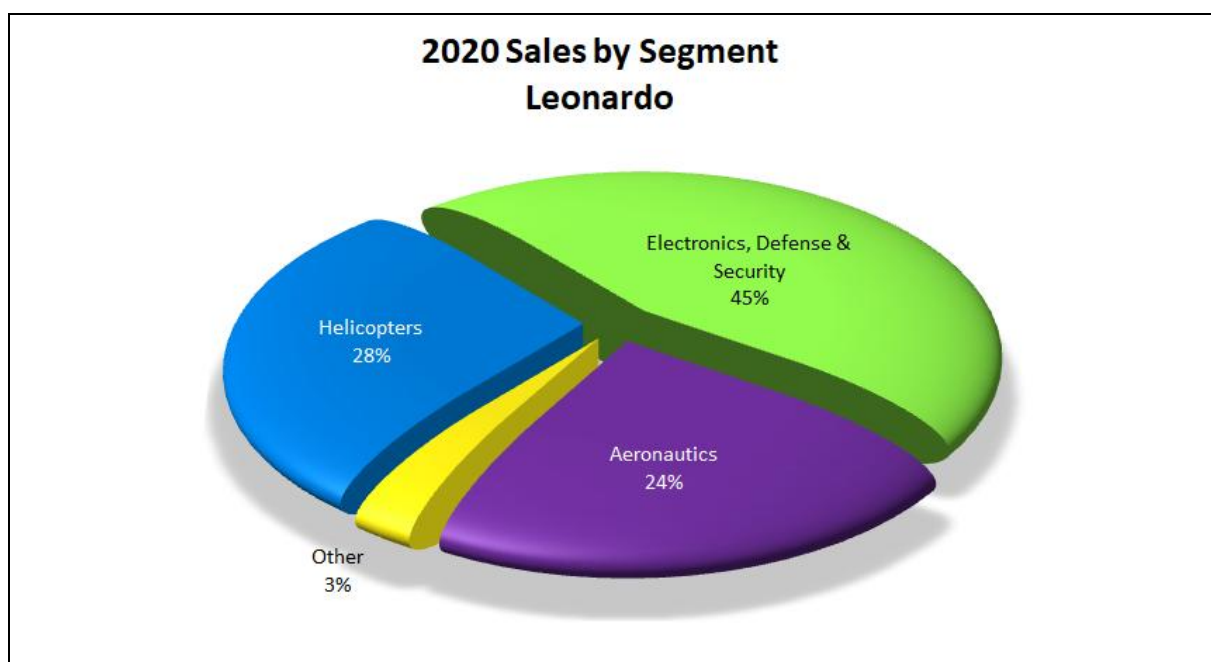
HELICOPTERS	2016	2017	2018	2019	2020
(EUR millions)					
New Orders	3,737	3,153	6,208	4,641	4,494
Backlog	10,622	9,896	12,151	12,551	12,377
Revenue	3,639	3,438	3,810	4,025	3,972
R&D Expenditures	361	343	333	436	N/A
EBITA*	430	281	359	431	383
Employees	11,874	11,456	11,596	12,331	N/A
DEFENSE ELECTRONICS & SECURITY	2016	2017	2018	2019	2020
(EUR millions)					
New Orders	6,726	6,146	6,823	7,022	7,374
Backlog	11,840	11,780	12,572	12,848	13,449
Revenue	5,468	5,550	5,953	6,701	6,525
R&D Expenditures (Electronics, D&S Systems)	813	797	803	871	N/A
EBITA*	558	537	522	613	537
Employees	22,174	22,090	22,860	23,736	N/A
Leonardo DRS (included in Defense Electronics & Security)	2016	2017	2018	2019	2020
(EUR millions)					
New Orders	1,737	1,785	2,438	2,611	2,674
Revenue	1,584	1,724	1,980	2,438	2,414
EBITA*	116	129	128	186	177

Leonardo

AERONAUTICS	2016	2017	2018	2019	2020
(EUR millions)					
New Orders	10,158	2,615	2,569	2,788	2,552
Backlog	13,107	12,525	12,220	11,640	10,696
Revenue	3,130	3,093	2,896	3,390	3,393
R&D Expenditures	196	397	302	218	N/A
EBITA*	347	311	328	362	200
Employees	10,367	10,316	10,659	11,215	N/A

* Earnings before interest, taxes and amortization.

N/A = Not Available

**Helicopter Deliveries**

Leonardo delivered 111 rotorcraft in 2020, down almost 29 percent from 156 deliveries in 2019.

HELICOPTER DELIVERIES	2018	2019	2020
AW139/W3	69	69	48
AW169	21	30	14
AW189/149	15	4	10
AW109/AW119/SW4/SW009	56	34	25
AW101	4	6	5
AW159	0	2	0
NH90	11	11	9
CH-47	1	0	0

Source: Leonardo Annual Results Presentation

Leonardo

GEOGRAPHIC SALES	2016	2017	2018	2019	2020
(USD millions)					
Italy	2,148	1,917	1,811	2,224	2,228
United Kingdom	1,541	1,353	1,348	1,405	1,284
Rest of Europe	3,251	3,030	3,084	3,199	2,865
North America	2,999	2,957	3,415	3,982	3,829
Rest of the World	2,063	2,477	2,582	2,974	3,204
TOTAL	12,002	11,734	12,240	13,784	13,410

Major Competitors

The conglomerate nature of Leonardo's portfolio sees the firm competing against the products and services of other large aerospace and defense companies. Some of the firm's most notable competitors include units of Airbus, BAE Systems, Boeing, General Dynamics, Lockheed Martin, Northrop Grumman, Raytheon Technologies, Safran, and Thales.

In the helicopter market, Leonardo faces competition from Bell Helicopter, Airbus Helicopters, Russian Helicopters, and Lockheed Martin's Sikorsky.

Key Leonardo DRS competitors include BAE Systems, L3Harris Technologies, and Raytheon Technologies.

Strategic Outlook

In what has been a challenging period, Leonardo has been well served by its diversified portfolio of defense and commercial programs. Overall, the company bounced back quickly from the crisis, with some sectors performing better than others, mirroring their relation to markets hardest hit by the COVID-19 pandemic.

Among the hardest hit sectors during the crisis was the company's civil aerospace operations, which were impacted by the months-long halt in air travel. The result was a slowdown in production volumes for aerostructures such as the 787 as well as sales of civil helicopters and ATR aircraft. Also somewhat impacted were the company's electronics operations in Europe, which saw reduced growth due to the effects of COVID-19.

These slowdowns were offset by strong backlogs at the company's U.S. subsidiary, Leonardo DRS, and the growth of the Eurofighter Kuwait program, which is ramping up. Thanks to this diversity, the company has demonstrated resilience in these extreme market conditions.

With vaccine distribution increasing and air travel returning, the company is looking forward to the nascent recovery. This period is expected to take place slowly in the civil market, which will not return to pre-pandemic levels before 2023 and potentially not until 2025.

Prior to the crisis, Leonardo had successfully initiated a restructuring effort that bore fruit. Under its Leonardo

2.0 effort, the company aims to achieve double-digit profitability by the early 2020s. This effort tightened project cost control and invested some EUR500 million (\$624 million) in core technologies.

The biggest action to date in this strategy was the company's reorganization of its electronic activities under a new division. The eponymous Electronics Division is the new umbrella for the company's Land and Naval Defense Electronics, Airborne and Space Systems, and Defense Systems divisions. The Traffic Control Systems and Automation Systems lines of business also fall under the new division's aegis. According to the company, the new division will be better able to compete, as its organization now mirrors that of its competitors and has the necessary critical mass to be viable.

Prior to the pandemic, Leonardo Helicopters was doing quite well thanks to program wins for the NH90 and key wins in the U.S. The helicopter unit scored a major upset when its MH-139 Grey Wolf was selected as the winner of the U.S. Air Force's UH-1N Huey replacement program. The helicopter is based on the AW139 and is offered by Boeing as prime contractor. Leonardo assembles the helicopters at its northeast Philadelphia plant, with Boeing integrating military-specific components at its Ridley Park facility south of the city. With success begetting success, in early 2020 the company was selected by the U.S. Navy to provide 32 TH-73A training helicopters. These wins give

Leonardo

Leonardo a solid win in the U.S. market after years of disappointment.

As it seeks to build its presence in the rotorcraft market, Leonardo expanded its portfolio with the \$185 million takeover of Kopter. The company said that this move allows Leonardo to further strengthen its position in the rotorcraft sector. Kopter's SH09, a new single-engine helicopter, allows Leonardo to quickly and easily expand its product base in a sector in which it previously had minimal exposure. The Swiss company's competencies will boost future developments toward more disruptive technologies, mission capabilities, and performances, including hybrid / electrical propulsion solutions. This acquisition replaces a planned investment aimed at the development of a new single-engine helicopter. With this further enlarged product range, Leonardo is aiming to gain more market share in the civil sector.

While civil production will mirror the recovery as a whole, the company, along with Airbus, is looking to counter new programs under development in the U.S. The United States is moving forward with a bevy of new designs under its Future Vertical Lift effort, with billions invested. In order to not get squeezed out of the future market, Airbus and Leonardo, along with European governments, need to accelerate rotorcraft efforts such as NATO's Next Generation Rotorcraft Capability program. While military development and production are key to maintaining a competitive capability, they also benefit commercial production as the technologies trickle down.

Aerostructures production continues to be a key component of the firm's aeronautic operations. Here the firm produces large structural components for a variety of commercial aircraft such as the 787, 767, ATR, A321, and A220 and for military platforms such as the

F-35, Eurofighter, and C-27J. Looking ahead, the company is working on two new European new generation projects: Tempest with the United Kingdom, Sweden, and Italy and the MALE2025/Euromale UAV program in partnership with Airbus and Dassault.

At the company's semi-autonomous U.S. subsidiary, Leonardo DRS, the future is muddled following a canceled IPO attempt in early 2021. The company had hoped to raise \$807 million through a sale of about a 22 percent stake in the division, with Leonardo maintaining ownership with a 78 percent holding. Speculation is that the new Biden administration's planned cuts in U.S. defense spending led to a lack of buyer interest. Should market conditions improve, Leonardo will likely reinvestigate the IPO option for DRS, which has been a storied purchase for the firm.

DRS was acquired for \$5.2 billion in 2008, shortly before the financial crisis. The value of the deal has since plummeted, with DRS's sales reported at \$2.7 billion for 2020 in Leonardo's annual report (lower than Leonardo may like, but much improved over past-year results of \$1.8 billion). As a result, DRS underwent significant cost-cutting through both divestitures and layoffs, reducing its employee count from a high of 10,000 to about 5,500 currently. This restructuring appears to be paying off, as DRS sales have begun trending upward and increased growth in the U.S. has led to several facility expansions. At this junction, the diminishment in its stake may have more to do with cash conversion measurements brought on by the COVID-19 pandemic.

The actions undertaken so far make it clear that the strategy of Leonardo's management is correct. While the impact of COVID-19 will linger for several years, longer term, the company's foundation should see it through.

Prime Award Summary

The following table and chart show the dollar volume of U.S. federal prime contracts awarded from 2016 through 2020, and the top-100 rank (if applicable) of the company in terms of federal contracts issued for each of the five years.

Leonardo	2016	2017	2018	2019	2020
(USD millions)					
Rank	54	66	52	45	49
Total Federal Awards	1,091	943	1,385	1,521	1,490

Leonardo



Source: <https://beta.sam.gov/reports/awards/static> Top 100 Contractors Report

Program Activity

Some important aerospace and government programs currently underway at Leonardo are discussed below. The following are the company's business interests:

- Aircraft
- Civil and Military Fixed-Wing Aircraft
- Civil and Military Helicopters
- Defense Electronics
- Avionics
- Radar
- Sensors
- Military Vehicles
- Gas Turbines
- Missiles
- Ordnance Systems
- Space Systems
- Systems Integration
- Training Systems
- Unmanned Vehicles

U.S. Contract Vehicles

Contract vehicles offer federal agencies a convenient mechanism for obtaining a wide variety of management and technology services.

Indefinite delivery/indefinite quantity contracts provide for an indefinite quantity of services for a fixed time. They are used when the U.S. General Services Administration (GSA – www.gsa.gov) cannot determine, above a specified minimum, the precise quantities of supplies or services the government will require during the contract period. IDIQs help streamline the contract process and speed service delivery. IDIQ contracts are most often used for service contracts and architect-engineering services.

Under the GSA Schedules (also referred to as Multiple Award Schedules and Federal Supply Schedules) program, the GSA establishes long-term government-wide contracts with commercial firms to provide access to over 11 million commercial supplies (products) and services.

Leonardo

Leonardo DRS currently holds positions on the following contracts:

GSA Schedules

- GSA Schedule 70
- GSA Schedule 84

GWAC/IDIQ Contracts

- Alliant 2
- EAGLE II
- Future COMSATCOM Services Acquisition (FCSA)
- GTACS
- ITES-3S
- SeaPort-e
- SEWP-V

For details on these contracts, please visit:
www.leonardodrs.com/about-us/contract-vehicles

Aircraft Programs**Airbus**

Leonardo is a subcomponent producer on a variety of Airbus commercial transport aircraft. For the A330, the company manufactures the empennage – Section 19 and the tailcone; for the A340, the tailcone; for the A380, the center upper fuselage and forward lower fuselage; and for the A321, the front fuselage for the new ACF (aircraft cabin flex) configuration.

ATR Series

The ATR series are pressurized, twin-turboprop-powered aircraft designed for scheduled regional / commuter transportation on short-range routes up to approximately 1,000 nautical miles. The aircraft are produced by Avions de Transport Régional, a joint venture of Airbus SE and Leonardo. Production of the ATR 42 and ATR 72 is ongoing.

Boeing

Leonardo is a subcontractor on a variety of Boeing commercial aircraft. Key models and components include the Boeing 767 – aileron, spoiler, nose radome, trailing edge flap, fin and rudder, leading-edge slat, elevator, and wingtip; the Boeing 777 – radome and outer wing flap; and the Boeing 787 – fuselage sections and stabilizers.

Boeing/BAE Harrier II

This is a single-engine, single- and twin-seat, transonic, VSTOL (vertical short takeoff and landing) ground attack aircraft. Boeing and BAE Systems are the prime contractors. The Harrier II Plus program added Alenia, CASA, and Raytheon. Alenia performed final assembly of the Harrier II Plus aircraft ordered for Italy.

Eurofighter Typhoon

The Typhoon is designed to fill the needs of the air forces of Germany, Italy, Spain, and the U.K. for an all-weather multirole combat aircraft. Under the currently structured Eurofighter Jagdflugzeug consortium, BAE manufactures the front fuselage and half of the right wing, Airbus Defence and Space provides the center fuselage and vertical stabilizer, Leonardo produces half of the rear fuselage and left wing, and Airbus SE builds half of the rear fuselage and half of the right wing. The aircraft is in production.

In April 2016, Kuwait confirmed an order for 28 Eurofighter Typhoons. The contract signed by Leonardo includes logistics, operational support, and the training of flight crews and ground personnel, which will be carried out in cooperation with the Italian Air Force. Deliveries were to begin in 2020. The most recent order was from Qatar, which signed a \$6.7 billion contract covering 24 aircraft in December 2017; deliveries are to begin in 2022.

Germany signed a contract with Airbus in November 2020 for 38 more Typhoons as part of its Project Quadriga program. The Quadriga aircraft will replace the Luftwaffe's fleet of Tranche 1 Eurofighters. Deliveries are likely to begin in 2024 from the consortium's Manching, Germany, production line.

In October 2020, Eurofighter announced that it had submitted a proposal covering 20 new aircraft for Spain to replace a number of Boeing F/A-18 fighters. Purchasing these aircraft would allow the Spanish government to keep the Eurofighter production facility in Getafe, Spain, running until 2030.

Leonardo C-27J

This is a pressurized, twin-turboprop tactical military transport derived from the Alenia G222. The aircraft is fully pressurized and engined with either General Electric T64 or Rolls-Royce Tyne turboprops. The C-27J is in service with several air forces around the world, including Italy's. Production is forecast to be in the single digits annually over the next 10 years. The aircraft competes against the Airbus C-295, which has steadily outsold the C-27J in recent years.

Leonardo M-345

The M-345 HET (High Efficiency Trainer) is a single-engine basic jet trainer in development that competes against turboprop trainers like the Pilatus PC-21, Beechcraft T-6, and KAI KT-1. It is an updated and repowered version of the Aermacchi S-211/M-311 trainer. Powered by a single Williams FJ44-4M-34 non-augmented turbofan, the new model made its maiden flight in December 2016.

Leonardo

The Italian Air Force has ordered 18 units from a total requirement for up to 45 aircraft. The new type, designated T-345A by the Italian Air Force, will gradually replace the 137 MB-339s that have been in service since 1982. The M-345 secured initial certification in May 2020. The first two M-345 trainers were delivered to the Italian Air Force in December 2020.

Leonardo M-346

This is a two-seat, twin-engine jet trainer and light attack aircraft. Leonardo was contracted to build six M-346 Master trainers for the Italian Air Force. This order was later expanded to 15 aircraft, which the Italian government is buying with economic development funds to help Leonardo sell the M-346 on the international trainer market. In July 2016, Leonardo launched a new dual-role version of its M-346 jet trainer – the M-346 FT – which will be able to both train pilots and function as a combat aircraft. Leonardo has also secured a launch customer for its M-346FA light fighter variant. It did not identify the customer for six aircraft, thought to be Turkmenistan, when it announced the new order in July 2019. The aircraft is forecast to take a slice of the jet trainer market in coming years as nations replace large numbers of Cold War-vintage aircraft.

Lockheed Martin F-35 Joint Strike Fighter (JSF)

This is a single-engine, single-seat, multirole combat aircraft. Leonardo participates in the F-35 design and will be a "second source" supplier of the wing box. Under current industrial participation agreements, Leonardo will produce a minimum of 835 full wings. The company was originally slated to produce 1,215 wings before Italy reduced its F-35 purchase from 131 aircraft to 90. Leonardo's full rate of production will be 66 wings per year, expandable to 72 wings annually.

Most F-35s undergo final assembly at Lockheed Martin's facilities in Fort Worth, Texas. However, a second final assembly line was established at Cameri Air Base in northern Italy, where Leonardo is assembling Italian and Dutch F-35s. Leonardo also hopes to assemble F-35s for other customers. Ground for the second assembly line was broken in October 2010. The first Italian-built aircraft made its maiden flight in September 2015. The Italian Final Assembly and Checkout (FACO) facility is the only one in Europe and is currently assembling Italian and Dutch F-35s. The Cameri-based operation will also serve as a maintenance hub for European-based JSFs.

Website: <https://www.f35.com>

Rotorcraft Programs

Boeing CH-47

The CH-47 Chinook is a twin-engine, medium/heavy-lift transport helicopter. Leonardo is a licensee for this program, having built more than 170 of the aircraft. In May 2009, Leonardo and Boeing signed a EUR900 million (\$1.19 billion) contract for the manufacture and support of 16 ICH-47F Chinook helicopters for the Italian Army. The contract, which includes options for an additional four helicopters, makes Boeing the prime subcontractor to Leonardo for the aircraft. Boeing builds the ICH-47F fuselage at its facility in Ridley Park, Pennsylvania. Prime contractor Leonardo is responsible for design, systems integration, final assembly, and aircraft delivery to the Italian Army. The Italian Army took delivery of its first two ICH-47F Chinook helicopters in October 2014. All aircraft were delivered by mid-2017.

Leonardo AW101

The EH101 was renamed AW101 and is in production. This is a three-engine, medium-lift, multirole military and commercial transport and special-purpose helicopter. Prior to the formation of Leonardo, the original contractor, EH Industries, had been jointly controlled (50 percent each) by Agusta and GKN Westland Helicopters. Leonardo is currently building AW101s for the Royal Norwegian Air Force and the Polish Navy.

Leonardo AW109/GrandNew

The Agusta AW109 is a twin-engine, eight-seat, single-main-rotor multipurpose commercial and military helicopter. Civil applications include corporate transportation, EMS, aerial photography, resource development support, police traffic patrol, fishery / environmental protection, and scheduled and non-scheduled passenger carriage. Military applications include aerial scouting, light anti-tank, command and control, utility, electronic warfare, reconnaissance, medevac, anti-submarine warfare, and electronic countermeasures duties. The AW109 was Agusta's first indigenous post-World War II helicopter. The GrandNew variant offers a bigger cabin and better performance, making it more popular than the base model. Production by Leonardo is ongoing.

Leonardo AW119

The AW119 is a single-engine, eight-seat, single-main-rotor, multipurpose commercial and military helicopter. Civil applications include corporate passenger transportation, emergency mission support duties, aerial photography, scheduled and non-scheduled passenger carriage, and utility/cargo transport.

Leonardo

To boost sales in India and Southeast Asia, the manufacturer entered into an MoU with India's Tata Group in February 2009 to create a joint venture company that will assemble the AW119Ke in India. The joint venture, Indian Rotorcraft, will not only serve demand in India but also be responsible for final assembly and completion and delivery to customers worldwide. The joint venture broke ground on a new production facility at Hyderabad's Rajiv Gandhi International Airport in March 2012.

TH-73A. In January 2020, Leonardo won the TH-XX competition to replace some 130 TH-57 Sea Ranger training helicopters. The company was awarded a firm-fixed-price contract valued at \$176.5 million for the production and delivery of 32 helicopters, initial spares, support, and dedicated equipment, and specific pilot and maintenance training services. Production of this order will run through October 2021. The new helicopter, based on the AW119Kx, is designated TH-73A in U.S. Navy service. In November 2020, the U.S. Department of Defense exercised a \$171 million option for an additional 36 TH-73A aircraft, with work expected to be completed in December 2022 in Philadelphia.

Leonardo AW139

The AW139 is a twin-engine, 15-passenger civil / commercial helicopter. Leonardo has produced the popular AW139 twin-engine helicopter in both Italy and the U.S. since the opening of a new production line at the company's Philadelphia facility in February 2008. A joint venture agreement with Russia's Oboronprom will add another assembly facility outside Moscow under an agreement reached in 2008. The AW139 has sold particularly well for use as a search-and-rescue (SAR) helicopter. It is also a favorite with operators in the offshore energy exploration and service market.

Huey Replacement. In September 2018, the U.S. Air Force selected a militarized version of the AW139 helicopter, the MH-139, to replace its UH-1N "Huey" fleet. Under an estimated \$2.38 billion effort, the team of Boeing and Leonardo will produce 84 helicopters. The first MH-139, named Grey Wolf, was delivered in 2019. Service entry is slated for 2021. The Boeing-Leonardo partnership was first announced in March 2017. Leonardo will assemble the helicopters at its northeast Philadelphia plant, with Boeing integrating military-specific components at its Ridley Park facility south of the city.

Leonardo AW169

This is a twin-engine, eight- to 10-passenger utility helicopter. Leonardo launched the AW169 helicopter program in July 2010 at the Farnborough Air Show. The all-new model is designed to slot into the gap between the company's AW109/GrandNew model and

the AW139, which sits atop the light commercial helicopter market. The first test aircraft made its maiden flight on May 10, 2012, at the company's Cascina Costa plant in Italy. The first test aircraft was joined by two more test aircraft later in 2012 and a fourth in 2013. The AW169 entered full-scale production in early 2015; deliveries followed in 2016. Production is ongoing.

Leonardo AW189

The AW189 is a 16- to 18-passenger military transport helicopter derived from the successful AW139. Leonardo developed the AW149 to bid for the Turkish Utility Helicopter Program (TUHP), but the Turkish government's selection of the Sikorsky UH-60 Black Hawk for the program in 2011 left the manufacturer in search of a launch customer. Leonardo leveraged the work it had done on the AW149 by developing a new civil variant, the AW189, which is a commercial model targeted at the offshore energy support and SAR markets. An AW189 prototype made its maiden flight in December 2011. Leonardo targets the AW189 for the oil and gas industry and SAR market. Demand from the offshore oil and gas sector remains suppressed, diminishing prospects for sales growth.

Leonardo AW249

In January 2017, Leonardo was contracted to develop a new attack and escort helicopter for the Italian Army. Known as the AW249, the new helicopter will have a maximum takeoff weight of 7 to 8 tonnes. The multiyear contract, awarded under the New Exploration and Escort helicopter (NEES) program, covers the development, production, and testing of three prototype helicopters. According to Leonardo, the Army requires 48 helicopters to replace its current fleet of A129 Mangustas, which are scheduled to be retired around 2025. Leonardo is also promoting the AW249 for export sales, targeting in particular Poland's Kruk procurement program.

Leonardo AW609

This is a twin-turboshaft-powered, six- to nine-passenger corporate tiltrotor aircraft that was originally developed by Bell/Agusta Aerospace Co. Under an agreement announced in June 2011, Leonardo purchased Bell's share of the BA609 program. The Italian company now has full ownership and control of the project. Bell remains a major component supplier for the aircraft, which was renamed the AW609. Bell will also receive a licensing fee for each AW609 sold. First flight occurred in March 2003. Certification of the AW609 by the U.S. Federal Aviation Administration (FAA) and European Union Aviation Safety Agency (EASA) has slipped. As of November 2020, Leonardo

Leonardo

was not specifying target dates for FAA certification of the AW609 and initial delivery.

Leonardo/Kopter SH09

This is a single-engine, eight-seat, single-main-rotor light utility helicopter. The SH09 is an all-new single-engine helicopter developed by Kopter, a start-up company that began development of the helicopter in 2009. In April 2020, Leonardo acquired Kopter and its SH09 program to provide a replacement for the AW119Kx in its product line without incurring the cost of developing its own all-new light helicopter. Testing of the SH09 is nearly complete; certification is expected in 2022.

Leonardo Lynx

This is a single-rotor, twin-engine, multirole military and commercial helicopter. The Lynx was originally designed by Leonardo and Aerospatiale to carry 10 combat-equipped troops and a crew of two and was also the first British-built aircraft designed entirely on a metric basis. The first of 13 prototypes flew in March 1971, but the first production-standard unit did not fly until February 1977. Leonardo flew the first AW159 Lynx Wildcat in November 2009. The U.K. Ministry of Defence ordered 70 of the upgraded model for the British military, including 40 helicopters for the Army and 30 for the Navy. A subsequent wave of cost-cutting in 2008 saw the order reduced to 62 units – 34 for the Army and 28 for the Navy. South Korea ordered eight Wildcats in January 2013. The Philippines ordered two aircraft, which were delivered in 2019. Leonardo Helicopters is now focused on upgrades and maintenance of the existing worldwide fleet of Lynx-family helicopters as it looks for new orders.

Leonardo NextGenCTR

Launched in 2014, the EU's Clean Sky 2 joint technology initiative includes a Leonardo-led effort called the Next Generation Civil Tiltrotor (NextGenCTR) project. The NextGenCTR project builds on earlier work conducted on the Enhanced Rotorcraft Innovative Concept Achievement (ERICA) design. The NextGenCTR concept involves a partial-tiltwing aircraft that could carry 19-25 passengers or a payload of 2,500 kilograms (5,512 lb). Initial flight of the demonstrator is planned for 2023.

Turkish Aerospace/Leonardo T129

The AW129 Mangusta (Mongoose) is a twin-engine, single-main-rotor, military anti-tank/ground attack / utility and commercial utility helicopter. Applications include the following: A129 – primary anti-armor capability, area suppression, and scouting; A129U – troop assault and search and rescue; and A139 – paramilitary and police operations, corporate and charter passenger transportation, offshore oil/gas

operations, and EMS. In September 2007, Leonardo received a contract to supply 51 helicopters to the Turkish Army, plus options for an additional 41 helicopters (known as the T129 in Turkish service). Turkish Aerospace Industries is considered the prime contractor for the program in Turkey, with Leonardo a major subcontractor. The T129A is a basic model intended to provide the Army with an interim capability. Plans call for the Army's nine T129As to eventually be upgraded to the T129B standard. T129B deliveries to the Turkish Army are underway.

NH Industries NH90

The NH90 is a medium-lift troop transport and ASW helicopter with potential commercial applications. NH Industries SARL, Aix-en-Provence, France, is the prime contractor. NH Industries is a consortium composed of Airbus Helicopters and Leonardo. A design and development contract was issued in September 1992. Deliveries began in 2006. A mid-2018 sale to Qatar, a repeat order from Spain, and a 2019 repeat order from Germany will help boost NH90 build rates in coming years. The NH90 is a potential candidate to fill numerous existing or emerging requirements for land-based or maritime helicopters around the globe.

Electronics Programs

Mounted Family of Computer Systems II

In June 2018, Leonardo DRS was awarded a five-year, IDIQ contract worth up to \$841.3 million to produce the next generation of U.S. Army mission command computing systems, called the Mounted Family of Computer Systems (MFoCS) II. The systems will support the U.S. Army's current modernization strategy for tactical platforms, including ground combat vehicles and command posts. The MFoCS II will support the continued fielding and upgrades of the Army's Joint Battle Command-Platform (JBC-P) and features critical system capability upgrades, cybersecurity improvements, and multitouch displays.

(Airborne Electronics)

AAQ-28(V) (Litening II/ER/AT/G4/SE)

The AAQ-28 Litening is an airborne electro-optics system combining targeting and navigation capabilities into one pod for day/night and adverse weather operations. The system is produced by Rafael, with Leonardo providing the system's laser illuminator.

AAQ-40 EOTS

The AAQ-40 Electro-Optical Targeting System (EOTS) is a multifunctional system for precision air-to-air and air-to-ground targeting. It features forward-looking

Leonardo

infrared (FLIR), IR search and track, and laser designation functionality. Lockheed Martin produces the AAQ-40, and Leonardo provides the system's High Energy Laser Rangefinder/Designator.

ASQ-170 Arrowhead M-TADS/PNVS

Arrowhead is a significant upgrade to the Apache Target Acquisition and Designation Sight/Pilot Night Vision Sensor (TADS/PNVS) system. Leonardo DRS supports prime contractor Lockheed Martin on this program.

PIRATE

The Passive Infrared Airborne Track Equipment is used on the Eurofighter Typhoon. The PIRATE passively detects and tracks the infrared signatures of multiple targets from long range and with a wide field of regard. It can also be used as a thermal imager with a cueing system for air-to-ground or air-to-air targets.

TIALD

The Thermal Imaging/Airborne Laser Designator pod is designed to provide military aircraft with laser designation and automatic target tracking capability, using both infrared and TV sensor data to maximize the accuracy of laser-guided and conventional munitions. The TIALD pod is intended for deployment on Tornado GR1/GR4 bombers, Jaguar GR1/GR5 strike aircraft, and Harriers. However, Leonardo claims the product can be fitted to any single- or twin-seat combat aircraft.

(C4I)**Integrated Broadcast Service (IBS)**

IBS is a U.S. system designed to integrate existing intelligence broadcast systems into a single architecture in order to transmit critical data to field commanders as soon as possible. All four of the U.S. DoD's IBS sites are now built, have achieved Initial Operational Capability, and are up and running. Leonardo DRS supports L3Harris Technologies on this program.

MIDS Family of Information Distribution Systems

The MIDS-LVT (USQ-140), MIDS-JTRS (USQ-190), and MIDS-On-Ship (URC-141), all known as Multifunctional Information Distribution Systems, are a family of military datalink terminals that provide Link 16, data, and voice communications. The MIDS terminals are utilized across the entire range of military operations, including numerous air, land, and sea platforms. Several manufacturers produce the MIDS family, including Data Link Solutions (a joint venture between BAE Systems and Collins Aerospace), EuroMIDS (a joint venture between Indra, Hensoldt,

Leonardo, and Thales), and Viasat, leading to a highly competitive sales environment.

NATO Alliance Ground Surveillance

The North Atlantic Treaty Organization (NATO) Alliance Ground Surveillance (AGS) program is developing a NATO-owned and -operated airborne ground surveillance system. The NATO AGS system will be composed of multiple systems (a system of systems). Leonardo is a participant in this effort.

NAUTIS

The Naval Autonomous Information System is a modular family of integrated naval command and control systems based on the Marconi Underwater Systems Naval Autonomous Intelligent Console (NAUTIC). The system utilizes distributed processing with a replicated system database in each workstation that is updated via an international-standard databus or command system highway. Leonardo DRS is a subcontractor to BAE Systems on this program.

PRC-343 Personal Role Radio

The PRC-343 PRR, manufactured by Leonardo, provides short-range communications for frontline soldiers. The PRC-343 is also known as the H4855.

(Electro Optical)**Long Range Advanced Scout Surveillance System (LRAS3)**

LRAS3 is a multisensor system for U.S. Army scouts. The line-of-sight system has near all-weather capability for target acquisition, with integrated second-generation forward-looking infrared (FLIR), a low-light-level TV, an eyesafe laser rangefinder, a digital compass, and a GPS. In October 1998, Raytheon and Leonardo DRS both announced, in separate press releases, the completion of the \$45 million partial sale of Raytheon's Second Generation Ground Electro-Optical Systems and a part of Raytheon's Focal Plane Array operations to Leonardo DRS. However, it appeared that Raytheon kept much of the LRAS3 EMD project after the sale was completed, and the arrangement may be close to a 50-50 split between the two companies. Raytheon and Leonardo DRS now share production of the LRAS3.

PAS-13

The PAS-13 thermal weapon sight (TWS) is designed to be used for observation and fire control of individual and crew-served weapons. Raytheon, Leonardo DRS, and BAE Systems are all major suppliers of PAS-13 thermal weapon sights. Leonardo DRS has chalked up numerous orders for its version of the system, the TWS II. The U.S. Army's FY21 defense budget includes \$866 million for procurement of TWS variants and supporting technology through FY25.

Leonardo

VAS-5 Driver's Vision Enhancer

The VAS-5 Driver's Vision Enhancer (DVE) is a FLIR thermal imaging device for drivers of battlefield tactical vehicles. The VAS-5 DVE allows the driver of tactical vehicles to continue normal driving operations without interference from snow, fog, haze, smoke, and other battlefield obscurants.

(Electronic Warfare)

AAQ-24 DIRCM (Nemesis)

This is an integrated missile-warning and directed infrared countermeasures system. The U.K. refers to the system as the Nemesis; it is produced under Program AR 18246. In August 2006, Northrop Grumman and Leonardo entered into a strategic alliance to work on the DIRCM system's Mini Pointer-Tracker assembly. Under the terms of the agreement, future collaboration on DIRCM variants (such as the LAIRCM system) was made possible.

BriteCloud

This is a new-generation expendable airborne anti-missile countermeasures decoy system. The BriteCloud expendable active decoy (EAD) consists of a self-contained digital RF memory (DRFM) jammer designed to disrupt incoming missiles' RF tracking systems. The system is currently used on Saab's Gripen. In June 2017, Leonardo launched BriteCloud 218, which adapts BriteCloud technology to be compatible with aircraft such as the widely operated F-16 and F-15.

BriteEye

In June 2017, Leonardo announced its latest electronic warfare survivability product, BriteEye. The product is a defensive aids suite that combines sensing and countermeasures into a single integrated product. BriteEye can detect radar-guided radio frequency (RF) threats to aircraft and launch appropriate countermeasures to keep aircrews safe. The system uses technology from Leonardo's SEER radar warning receiver to detect RF threats and can then automatically cue countermeasures from an integrated countermeasure dispensing system, including flares and Leonardo's BriteCloud expendable radar-jamming decoy. The BriteEye system is designed to fit a compact and lightweight form factor, making it suitable for a variety of small aircraft and UAVs.

EuroDASS/Praetorian

Used on the Eurofighter Typhoon, the EuroDASS Praetorian self-protection system is designed to automatically counter air-to-air and surface-to-air threats upon detection and evaluation. The system for the most part comprises electronic countermeasures (ECM), electronic support measures (ESM), and missile

approach warning (MAW) subsystems as well as a defensive aids computer (DAC) for overall system control. The EuroDASS Praetorian system should be produced over the next several years for application on Eurofighter Typhoons. The system is produced by the EuroDASS consortium, with Leonardo acting as the prime contractor. Other consortium members include Italy's Elettronica and Spain's Indra.

Sky Guardian

A radar warning receiver (RWR) for helicopters and fixed-wing aircraft, the Sky Guardian is designed to provide octantal indication of threat direction. The Sky Guardian is suitable for installation on fixed-wing aircraft and helicopters, as a stand-alone RWR, or for integration on a multifunction system such as the HIDAS. Leonardo coproduces the system with BAE Systems.

(Land & Sea Based Electronics)

SIRIUS LR-IRST

The SIRIUS system provides multispectral observation of coastal areas and can be used in theater ballistic missile defense, floating mine detection, and other surveillance missions. The system can further function as a stand-alone device or be fully integrated with other shipboard multisensor suites. Production for one of its primary platforms – Canadian Halifax class frigates – appears complete. The market for new SIRIUS systems may always be tight, however, because the number of potential naval vessels and good candidate upgrade programs is limited.

SSQ-32(V)

The SSQ-32(V) is an advanced surface ship, minehunting, search and classification, variable depth sonar. Platforms include the U.S. Navy MCM Avenger class and MHC Osprey class mine warfare vessels, Japan Maritime Self-Defense Force MCM vessels, and the Spanish Armada (Spanish Navy), with potential for application on mine warfare ships of other navies. DRS Sonar Systems LLC, a Leonardo DRS majority-owned joint venture company with Thales North America Inc, is the second prime behind Raytheon Technologies on this program.

SSQ-53(V)

The SSQ-53(V) is a family of passive directional frequency analysis and recording (DIFAR) sonobuoys composed of several models. The SWD100 is a bottom-mounted shallow water DIFAR sensor produced by Leonardo DRS Electronic Systems. It is a modified version of the SSQ-53 sonobuoy, reportedly with improved attributes for extreme shallow water conditions and extended periods of performance.

Leonardo**(Radar)****APQ-187 Silent Knight Radar (SKR)**

SKR is a new terrain following/terrain avoidance radar being developed for low-flying aircraft used in special operations missions. The Silent Knight Radar is also referred to as the Special Operations Forces Common TF/TA radar. The Silent Knight is intended for low-flying special operations aircraft such as the MH-47, MH-60, MC-130, and CV-22. Prime contractor Raytheon awarded Leonardo DRS a \$20 million contract in 2007 to develop technology for the SKR.

ECR-90C (Captor)

The Euroradar Captor, formerly the ECR-90C (European Collaborative Radar), is a third-generation, X-band, multimode, pulse-Doppler radar tasked with air-to-air and air-to-ground combat. The ECR-90 radar is the primary sensor on board the Eurofighter Typhoon, specially tailored for air defense. Its secondary mission is air-to-surface attack. Euroradar is led by Leonardo and includes Airbus SE and Indra. In October 2010, Leonardo won a contract for 88 Captor radars for the Eurofighter Tranche 3A program. Production-standard Captor-E AESA radars are now flying. The availability of the Captor-E AESA model will spur a prolific retrofit market.

Grifo

The Grifo is a family of multimode airborne, pulse-Doppler, I-band radars produced by Leonardo. The Grifo is designed for air-to-air and air-to-ground combat missions for Italian Air Force AMX aircraft. A naval variant, designated the Grifo-ASV and used for anti-ship purposes, is installed on naval versions of the AMX. Variants appear on Pakistani FC-1s, Taiwanese and Singaporean F-5s, and new Czech L-159s.

HALO

The Hostile Artillery Location system consists of three groups of low-profile, covert microphones positioned around a battlefield and command post, providing wide-ranging coverage of the surveillance area. The command post processes the information from the sensors using a map overlay of the position and grid locations of artillery activity. Leonardo is the prime.

Kronos

Kronos is a family of AESA naval radars that are produced by Leonardo. The radars equip a large number of ship types. Customers include Bangladesh, Italy, Peru, Qatar, and the UAE. Kronos was developed from the MFRA radar (later rebranded as Kronos MFRA), and is available in three variants: the Kronos Grand Naval, Kronos Naval, and Kronos Power Shield.

Orion

The Orion is a naval tracking radar tasked with the acquisition and tracking of airborne and surface targets for naval weapons systems. The system is in production and service. Leonardo is the prime.

PPS-5C/D/E

The PPS-5C Man-portable Surveillance and Target Acquisition Radar (MSTAR) is a lightweight, pulse-Doppler, J-band radar system used to meet the surveillance requirements of land-based reconnaissance elements. It can also play a secondary role when involved in perimeter surveillance of high-value installations. The PPS-5D/E SR Hawk is another family of ground surveillance radars carrying the PPS-5 designation.

RAT-31

The RAT-31 is a fixed or relocatable E/F-band 3D radar tasked with medium- and long-range air surveillance. The RAT-31S, which was designed to detect aircraft at high, medium, and low altitudes, incorporates sophisticated electronic counter-countermeasures characteristics and facilities for unmanned operation. It is designed for ease of transport and deployment. The systems are in production and service. Leonardo is the prime. The radar is slowly being replaced by models in Leonardo's Kronos line.

Raven ES-05

The Raven is a compact AESA radar with an electrically driven swash plate, allowing the AESA to cover a wide field of regard. Raven ES is a collaborative program between Leonardo and Saab for the Gripen E/F fighter, but technologies derived from the radar may find their way into other programs.

Scout

Scout (Signaal's Covertly Operating Undetectable Transceiver) is a naval surface radar with low power output that provides a low probability of intercept. Scout Mk 3 will be produced mostly as part of a "system within a system" associated with the NS50, NS100, NS200, and VARIANT radars. Thales is the prime contractor, with Leonardo DRS acting as a licensee.

Seaspray

The Seaspray is an I/J-band (X-band), lightweight, multimode radar for maritime and land surveillance missions and missile guidance. In September 2005, the U.S. Coast Guard selected the Leonardo Seaspray 7500E system for its HC-130H radar upgrade program. In May 2006, Leonardo was selected to supply the latest variant of the Helicopter Integrated Defensive Aids

Leonardo

System (HIDAS) for the U.K. Royal Navy's Surface Combatant Maritime Rotorcraft and the British Army's Battlefield Reconnaissance Helicopter.

SPQ-9B

The SPQ-9B Anti-Ship Missile Defense (ASMD) system is a pulse-Doppler, X-band surface search, target acquisition, and fire control radar. It is often deployed in conjunction with the Mk 86 gun fire control system (GFCs). The SPQ-9B detects and tracks sea-skimming anti-ship missiles. It equips CG-47, CVN, DD-963, DDG-51, F-100 Hobart, LHD, and NSC class ships, as well as shore training/support sites. In 2018, DRS Laurel Technologies took over production from incumbent prime contractor Northrop Grumman.

SPY-6 AMDR, EASR, and SPY-3 DBR

The Dual-Band Radar suite is made up of the Raytheon-produced SPY-3 X-band multifunction radar and a Lockheed Martin-produced S-band volume surveillance radar. The system is arranged in a compound active phased-array setup for shipborne air and missile defense. The developmental Air and Missile Defense Radar (AMDR) suite will replace the radars on board the U.S. Navy's AEGIS-equipped vessels. The AMDR suite is composed of two separate radar requirements, the AMDR-S S-band radar and the AMDR-X X-band radar. Raytheon will produce the SPY-6 AMDR-S system. A manufacturer for the AMDR-X component has not been selected. In the interim, Northrop Grumman's SPQ-9B will fill the AMDR-X's role in the AMDR suites (the SPQ-9B is now produced by DRS Laurel Technologies under a contract recompile).

EASR is a scaled-down version of the SPY-6 AMDR, designed to equip vessels where the full range and power of the larger radar is surplus to the mission requirement. It primarily serves air surveillance needs. DRS Power & Control Technologies provides DDG-51 power conversion modules for the SPY-6 AMDR.

Military Vehicle Programs

B1 Centauro

The Centauro was developed by the Defense Vehicles division of the Iveco consortium, headquartered in Rome, Italy. Iveco Fiat of Bolzano is the overall prime contractor, and Leonardo is responsible for the armament, a 105mm cannon. The B1 Centauro is in service with the Italian Army.

C1 Ariete

Leonardo and the Defense Vehicles division of the Iveco consortium codeveloped this tank. Iveco Fiat is the overall prime contractor, and Leonardo is responsible for the 120mm main armament and turret. The Ariete 1 is Italy's next-generation tank; a serial-

production run of 200 tanks for Italian Army procurement was completed in 2002. Ariete 2 production reportedly commenced in 2011. The Italian Army maintains a procurement objective of 700 Ariete tanks – the 200 C1 Arietes already in service and 500 Ariete 2 main battle tanks. Production of the Ariete 2 is ongoing at a slow pace.

Dardo

This is a mechanized infantry combat vehicle optimized for transporting infantry during both offensive and defensive operations. Leonardo is responsible for the armament, the turret, and associated integration; the Iveco Defense Vehicles division produces the hull, the chassis, and automotive components. Serial production of an estimated 200 Dardos for Italian Army procurement began in 2001 and was completed by 2011.

Ordnance Programs

IM-SHORAD

In June 2018, Leonardo DRS was downselected by the U.S. Army to provide its mission equipment package for the service's accelerated Initial Maneuver Short-Range Air Defense (IM-SHORAD) effort. The mission equipment package includes kinetic and non-kinetic defeat capabilities and an onboard radar. When integrated on the Stryker A1 platform, the Leonardo DRS system will provide maneuver Brigade Combat Teams with a full "detect-identify-track-defeat" capability required to defeat UAS, rotary-wing, and fixed-wing threats. General Dynamics Land Systems will be the platform integrator for the IM-SHORAD system. In September 2020, General Dynamics Land Systems was awarded a \$1.2 billion to produce, test, and deliver IM-SHORAD systems.

In January 2021, Leonardo DRS received an initial contract for 28 IM-SHORAD Mission Equipment Packages (MEP) from General Dynamics Land Systems in support of the U.S. Army's recent IM-SHORAD production award. The award, received on December 2, 2020, is valued at more than \$600 million. Leonardo DRS will begin delivering the MEPs to General Dynamics for final integration onto purpose-built Strykers in 2022.

Leonardo 76mm Naval Gun

This is the standard cannon for the Italian Navy. The Leonardo 76mm naval gun was designed for anti-missile and anti-aircraft roles. Secondary roles include ASW (anti-ship) and naval gun support.

Leonardo 127mm L54/64

This is a dual-purpose, medium-caliber automatic gun mount developed by Leonardo. The system is in production and service aboard destroyers and frigates.

Leonardo

The Leonardo 127mm system is designed to serve as the main armament of destroyers or frigates requiring a multipurpose gun.

M109 155mm Self-Propelled Howitzer

Oto Melara (now Leonardo) manufactured the 155mm cannon for 221 M109 and 62 M109A1B self-propelled artillery systems purchased by Italy from the United States. Subsequently, a modified version of the M109 using a different cannon was developed. After evaluating this new system, Italy contracted with Leonardo to modify all Italian Army M109 systems to the new configuration, called the M109L.

Small Diameter Bomb

This is an air-launched guided bomb system. Boeing signed a contract with Leonardo to coproduce 500 SDB I weapons for the Italian Air Force.

Turrets

Leonardo produces a variety of turret systems for armored vehicles, including the HITFACT, HITFIST, and HITROLE systems.

Vulcano

This is a family of unguided and guided ammunition for 76mm and 127mm naval guns and 155mm land artillery systems. In February 2017, the U.S. Navy invited Leonardo to verify and test its Vulcano guided ammunition for potential application on the DDG 1000 Mk 51 155mm AGS.

Space Systems – Satellites & Spacecraft**(Civil Communications/TV Satellites)****Arabsat**

Arabsat is a geostationary commercial telecommunications satellite system. Arabsat provides telecommunications, digital and analog TV broadcasting, VSAT voice data transmission, and high-speed Internet access to Arab Satellite Communications Organization (ASCO) members. Airbus Defence and Space is the prime. Thales Alenia Space provides the electric generator subsystem and solar power generator.

Brasilsat/Star One

Brasilsat and Star One satellites are two related series of geostationary communications satellites serving Brazil and Latin America through Embratel. Boeing Satellite Systems (BSS) was the Brasilsat B1, B2, B3, and B4 prime contractor, supplying the BSS-376 and BSS-376W satellite buses and communications payload. Thales Alenia Space was the prime contractor for the C1 and C2, Star One's first two Ku-band satellites.

Eutelsat

Eutelsat is a European commercial communications satellite system. The Eutelsat system provides regional telecommunications – specifically, full-time transponder leases, telephony, occasional TV, VSAT, and land-mobile communications – by way of the Euteltracs system. Thales Alenia Space, Space Systems/Loral, and Airbus Defence and Space are the prime contractors.

Globalstar

The Globalstar is a satellite-based mobile communications system. Space Systems/Loral, Palo Alto, California, produces Globalstar satellites. Due to its acquisition by Thermo Capital, the Globalstar managed to avoid being forced to de-orbit its 48-satellite constellation. Its new owners have also made it clear that they are ready to make a strong investment in the Globalstar. Thales Alenia Space built the second-generation system under a contract worth approximately \$904 million. The first batch of six second-generation Globalstar satellites launched on board a Soyuz rocket in October 2010. All 24 second-generation satellites had been launched as of 2013.

Inmarsat

The Inmarsat system is a global constellation of telecommunications satellites. Under the Inmarsat program, the EuropaSat spacecraft would be built by Thales Alenia Space to address the S-band market in Europe. The EuropaSat was put on hold in 2009. In 2014, the project was revived as a joint project with Arabsat, under the name EuropaSat/HellasSat 3. Thales Alenia Space would build the satellite based on its Spacebus 4000 C4 platform. In June 2017, Inmarsat ordered a fifth Inmarsat 5 satellite. While the first four satellites were built by Boeing, Thales Alenia Space will build the fifth.

Intelsat

The Intelsat is an international satellite telecommunications system. Intelsat satellites provide a range of services, including voice, TV, and data transmission. Producers include Astrium, Boeing, and Space Systems/Loral. Thales Alenia Space is responsible for the communications repeater.

Iridium

The Iridium is a worldwide digital, satellite-based, cellular personal communications system. Thales Alenia Space was selected to provide 81 Iridium NEXT satellites under a \$2.2 billion contract. The constellation consists of 64 operational satellites, six in-orbit spares, and 10 newly launched satellites that were

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put into orbit in January 2017. The final 10 Iridium NEXT satellites were put into orbit in January 2019. Iridium likely won't need to replace Iridium NEXT satellites until the early 2030s.

Website: <https://www.iridiummuseum.com>

Spacebus Series

The Spacebus satellite series is intended for use in telephone/data communications and direct broadcast television. Thales Alenia Space is the prime contractor. So far, the model has been ordered for more than a dozen programs, including the Agila, Arabsat, Eutelsat, Hispasat, Hot Bird, Nahuel, Sirius, Stentor, TDF, Tele-X, Thaicom, Turksat, and TV-Sat. The Spacebus 2000, 3000, and 4000 models are in production. Thales Alenia Space is introducing a new variant of the Spacebus, known as the Spacebus 4000 NEO. However, orders remain erratic.

Spacecom

Spacecom is a commercial communications satellite company that operates Affordable Modular Optimized Satellites (Amos) spacecraft, which are small communications satellites for deployment in a geosynchronous orbit. Amos spacecraft provide telecommunications services to the Middle East, Europe, West Asia, Africa, and Atlantic North America. Israel Aerospace Industries Ltd, MBT Systems & Space Technology Electronics division, Yehud, Israel, is the program's prime contractor. Additional contractors include Thales Alenia Space (communications payload).

(Military Space Systems)

Galileo Satellite Navigation System

The Galileo is a European navigational satellite constellation similar to the U.S. Navstar Global Positioning System. The Galileo system is intended to provide secure civil navigation and positional data to all of Europe, relieving the continent of its dependence on the U.S. GPS. The Galileo will be used mainly for emergency, search-and-rescue, and security applications. It will be an independent civilian system compatible with both the GPS and GLONASS (Russia's version of GPS). Interoperability among the three systems is being discussed and would require only minor adaptations to ground systems software. OHB Systems is the prime. Thales Alenia Space provides power conditioning and distribution units. Galileo satellite launches will continue through 2021.

Helios / Optical Space Component (CSO)

Helios satellites are military optical imaging reconnaissance satellites. Composante Spatiale Optique (CSO) satellites are follow-ons. Helios satellites provide

military optical reconnaissance data from low-Earth polar orbit. Helios 1 systems are based on the SPOT 4 Earth resources satellite bus but have a higher resolution of 1 to 5 meters. Similarly, Helios 2 satellites are based on the SPOT 5 spacecraft platform and offer a 50-centimeter resolution. Airbus Defence and Space is the prime, with Thales Alenia Space providing the system's high-resolution instruments.

Helios' replacement, the Optical Space Component (Composante Spatiale Optique, or CSO) satellite constellation, is a high-resolution reconnaissance system. The first Optical Space CSO satellite (CSO-1) launched in December 2018. The first, second, and most of the third satellite are already funded, and therefore the three satellites are likely to be completed and launched. The CSO-2 launched aboard Soyuz in 2020; CSO-3 will be on one of the first Ariane 6 payloads in 2021.

(Remote-Sensing Satellites)

Copernicus

Copernicus, formerly known as Global Monitoring for Environment and Security (GMES), is an effort led by the European Space Agency and European Union to improve Earth observation. The space component of Copernicus will consist of a series of Sentinel satellites. Thales Alenia Space and Airbus Defence and Space build the Sentinel satellites used in the program.

COSMO-SkyMed/Pleiades

The COSMO-SkyMed/Pleiades is an international civil / military constellation of four COSMO-SkyMed low-Earth-orbiting radar satellites and two Pleiades remote-sensing satellites. The COSMO-Pleiades is a dual-use French-Italian satellite system designed to provide information on environmental damage, topography, the agricultural industry, and law infringement within the Mediterranean Basin. Thales Alenia Space was the prime contractor and an investor in COSMO-SkyMed. Italy is now focusing on the COSMO-SkyMed Second Generation (CSG) constellation, being developed by Thales Alenia Space. The first CSG satellite launched in December 2019. Two more COSMO-SkyMed satellites were ordered in December 2020. Airbus is pursuing the privately funded Pleiades Neo constellation, with plans to sell data to governments and commercial customers. Four COSMO-SkyMed and two Pleiades spacecraft have been produced and are in service. One CSG satellite is in orbit.

Earth-Observing System

The EOS is a series of scientific spacecraft forming part of the U.S. Earth Science Enterprise program. Thales Alenia Space is one of several contractors involved in this effort.

Leonardo**Earth System Science Pathfinder**

NASA's Earth System Science Pathfinder (ESSP) program funds low- to moderate-cost, small to medium-size missions that focus on scientific objectives to support studies of Earth's atmosphere, oceans, land surface, polar ice regions, and interior. Projects include airborne missions, and involve remote sensing satellite instruments and full satellites. Thales Alenia Space produces the Proteus satellite bus for this program.

Living Planet Program

The Living Planet Program comprises two main elements: a science and research arm in the form of Earth Explorer missions, and the Earth Watch element designed to facilitate the delivery of Earth observation data for eventual use in operational services. There are two categories of Earth Explorer missions: Core missions and Opportunity missions. Core missions are selected through consultation with the scientific communities and are led by the European Space Agency (ESA). Core missions are launched approximately every two years. Opportunity missions use smaller, lower-cost satellites, are less complex, and can be implemented more quickly. Therefore, Opportunity missions are expected to occur more frequently. Thales Alenia Space and Airbus Defence and Space are contractors on this effort. To date, eight missions have been selected for implementation: four Core missions and four Opportunity missions. In September 2017, ESA began seeking ideas for a 10th mission, with a planned launch date in 2027 or 2028.

Meteosat

Meteosat satellites form a part of the global geosynchronous weather satellite network called World Weather Watch, which also includes two U.S. Geostationary Operational Environmental Satellites (GOESs) and one Japanese GMS-3 (Himawari-3) spacecraft. A \$1.8 billion contract was signed with prime contractor Thales Alenia Space to begin work on the Meteosat Third Generation (MTG) program in 2012, and construction started shortly thereafter. MTGs are expected to secure Meteosat weather and climate data for Europe over the next 30 years. Under the MTG program, six satellites will be produced in two distinct variants: four imaging satellites (MTG-I) and two sounding satellites (MTG-S). MTG-I satellites will launch starting in 2022, while MTG-S satellites will launch starting in 2023.

(Scientific Spacecraft)**Bepi Colombo**

The Bepi Colombo is a mission consisting of two spacecraft that will explore the planet Mercury. The Bepi Colombo will study the magnetosphere of Mercury

and take images of the planet's surface. Thales Alenia Space is a program coproducer. The satellite launched in October 2018 and is now traveling to Mercury, with arrival planned for 2025.

Cosmic Vision 2015-2025

Cosmic Vision is a mechanism through which ESA science missions are implemented. The program aims to develop Small-Class (S-Class), Medium-Class (M-Class), and Large-Class (L-Class) spacecraft. Each Cosmic Vision mission conducts experiments in at least one of four main areas of study: planet formation and development of life; the solar system and the sun; fundamental physics, particularly as it applies to the Big Bang Theory; and the universe's origin and building blocks.

Thales Alenia Space was selected as the prime contractor for the Euclid (M-Class mission). The goal of the Euclid is to map the geometry of dark energy and study its nature in the universe. Euclid's launch is set for 2021. Airbus was the prime contractor for the LISA Pathfinder mission; however, Thales Alenia Space was awarded a contract to study LISA in June 2018. LISA is planned to launch in 2034.

ExoMars

The ExoMars program consists of two missions to Mars: one comprises an orbiter and a descent module that were launched in 2016, and the other features a rover. ExoMars missions will study methane in Mars' atmosphere and on its surface. The missions will also investigate the Martian environment and demonstrate new technologies, paving the way for a future Mars sample return mission in the 2020s. The ExoMars rover has suffered launch delays; the current launch window is between August and October 2022. Thales Alenia Space is the prime.

Unmanned Vehicle Programs**A-184/Black Shark**

The A-184 is a wire-guided, heavyweight, acoustic-homing torpedo with electric propulsion. Leonardo is its prime contractor. Leonardo and Naval Group formed an alliance to jointly produce and market heavyweight torpedoes. Naval Group received a contract in 2008 to develop a new heavyweight torpedo for the French Navy. This requirement is the Future Torpille Lourde (FTL), which will use the Black Shark as its basis.

A-244/S

The A-244/S is a lightweight acoustic-homing torpedo. EuroTorp GEIE, Sophia Antipolis, France, is the prime contractor.

Leonardo

AWHero

Leonardo produces this rotary-wing UAV. The AWHero was originally designated the SD-150 at its launch in 2012. First flight of the latest version of the AWHero occurred in December 2018. A new production facility for the AWHero was opened in Pisa in February 2019.

Falco

The Falco is an unarmed, medium-altitude, medium-endurance UAV based on the Mirach 26 air vehicle (see Mirach Series, below). The first flight of the Falco took place in December 2003. In March 2006, the first export order was announced when Pakistan purchased four Falco UAV systems. In 2009, the Falco EVO was unveiled with larger wings and extended tailbooms, allowing for larger payload capacity.

In June 2019, Leonardo unveiled the Falco Xplorer. The new drone features a payload capacity of 350 kilograms, is capable of more than 24 hours of flight time, and has satellite communications capability for beyond-radio-line-of-sight operations. It is undergoing certification for flight in non-segregated airspace, meaning Leonardo will be able to pitch it to civil customers such as coast guards and emergency responders as well as the military market. The drone made its first flight in January 2020.

Mirach 100

For decades, the Mirach 100 series has met the aerial target needs of militaries around the world. The latest version of the Mirach 100 is likely to continue this tradition. The Mirach 100/X, the newest version in this series, is the intended successor to the Mirach 100/5 model.

Mirach Series/HammerHead

These are multipurpose unmanned air vehicles intended to perform reconnaissance and surveillance missions and possibly electronic warfare operations. Leonardo has developed a family of UAVs for target drone and surveillance/reconnaissance operations and surface attack missions. Piaggio Aerospace and Leonardo developed the P.1HH HammerHead UAS. It is a derivative of the Piaggio Aero P.180 Avanti II platform and is intended to meet medium-altitude, long-endurance (MALE) UAV requirements. Italy is the launch customer for the HammerHead. This system will meet the Italian Air Force's MALE UAV requirement.

SLAT/Torpedo Defense

Leonardo is offering a line of torpedo decoy systems: the submarine-launched C303 stationary jammer and decoy, the submarine-launched C303/S stationary jammer and mobile decoy, the shipborne C309, the shipborne C310, and the SLAT (Système de Lutte Anti-Torpille). Leonardo is also marketing an underwater mobile target known as the BSS and the reusable Multi-Influence Self-propelled Target (MIST).

V-FIDES

This is an underwater robot for identification, detection, and exploration of the seas. The V-FIDES is being developed by a team led by Leonardo with the participation of Kayser Italia Srl and Scuola Superiore S. Anna. The vehicle is suitable for various missions: seafloor exploration, environmental monitoring, monitoring of civil plants, and simple robotic operations (cleaning, micro-coring, and water sample analysis).

U.S. Contract Awards

The following is a listing of major contracts awarded to Leonardo (primarily its U.S. subsidiary, DRS) from the United States government in the past two years and early 2021 (as of press date). Note that the Description section is excerpted directly from U.S. DoD listings. For full details on contracts and their associated modifications, visit <https://www.defense.gov/Newsroom/Contracts/>

Date	Award (USD millions)	Contract #	Description
2019			
1/30/19	67.3	W909MY-19-D-0004	PROCURE HORIZONTAL TECHNOLOGY INTEGRATION SECOND GENERATION FLIR BKIT COMPONENTS & ENGINEERING SERVICES.
1/31/19	74.9	W31P4Q-19-C-0006	RAPID DEVELOPMENT, PRODUCTION, DEPLOYMENT, AND SUPPORT OF THE MOBILE LOW, SLOW, SMALL UNMANNED AIRCRAFT INTEGRATED DEFEAT SYSTEM.
2/1/19	21.5	N00024-18-C-5395	PRODUCTION OF THE SPQ-9B RADA SYSTEMS & ASSOCIATED EQUIPMENT.

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Date	Award (USD millions)	Contract #	Description
2/25/19	8.9	N00024-15-D-5201	18 TECHNOLOGY INSERTION 16 AIR-COOLED COMMON PROCESSING SYSTEM CABINETS & TWO REMOTE ACCESS SERVERS.
3/5/19	29.6	N65236-15-C-1007	DESIGN & SYSTEM ENGINEERING SUPPORT SERVICES.
3/26/19	9.6	SPRRA2-19-C-0029	OPTICAL SIGHTING & RANGING EQUIPMENT.
3/29/19	16.4	N00019-16-C-0015	PROCURE 114 DAIRCM SENSORS & 29 DAIRCM PROCESSORS, SPECIFICALLY 64 SENSORS AND 16 PROCESSORS FOR THE AIR FORCE; 30 SENSORS AND 8 PROCESSORS THE NAVY; AND 20 SENSORS AND 5 PROCESSORS FOR THE ARMY.
3/29/19	10.5	N00024-13-C-4229	PROCURE AN ENERGY MAGAZINE PROTOTYPE DESIGN & ASSOCIATED PROTOTYPES.
4/8/19	53.7	N64498-19-D-4017	SUPPLY CONTRACT WITH COST REIMBURSABLE SERVICES FOR THE REPAIR STATION CONSOLE (RSC) IN SUPPORT OF DDG MODERNIZATION.
5/6/19	7.2	SPRRA2-19-C-0028	OPTICAL SIGHTING & RANGING EQUIPMENT.
5/13/19	28.6	?	NATIONAL AERONAUTICS & SPACE ADMINISTRATION SOLUTIONS FOR ENTERPRISE-WIDE PROCUREMENT CONTRACT VEHICLE.
5/24/19	977.0	?	PURCHASE AGREEMENT FOR THE U.S. SPECIAL OPERATIONS COMMAND (USSOCOM) DEPLOYED OPERATIONS TELECOMMUNICATION PROGRAM.
6/20/19	23.7	?	SUPPORT THE ARMY'S WIDEBAND ENTERPRISE SATELLITE SYSTEMS COMMERCIAL SATELLITE COMMUNICATIONS (COMSATCOM) NETWORK.
7/29/19	382.5	N00253-19-D-0004	DEVELOPMENT, INTEGRATION, AND PRODUCTION OF HARDWARE SOLUTIONS.
9/19/19	7.2	N00024-17-C-5200	CONTRACT FOR A CEILING INCREASE TO PERFORM SERVICES FOR EVALUATION, IMPLEMENTATION, PROOFING OF EQUIPMENT CHANGES, RELATED ENGINEERING SERVICES & REPAIRS, MODIFICATIONS/ALTERNATIONS & GOVERNMENT-FURNISHED EQUIPMENT REPAIR & MAINTENANCE IN SUPPORT OF COOPERATIVE ENGAGEMENT CAPABILITY (CEC) "BRAVO" EQUIPMENT.
9/20/19	14.6	SPRRA2-19-C-0018	PERISCOPE HEAD ASSEMBLIES.
9/27/19	11.6	SPRRA2-19-C-0028	FOR LOWER TARGET ACQUISITION.
9/30/19	21.6	SPRRA2-19-C-0029	TARGET ACQUISITION.
10/16/19	18.4	SPRDL1-20-C-0022	WIRED HOUSING ASSEMBLIES.
11/8/19	15.8	SPRDL1-20-C-0005	43 SEPARATE PARTS IN SUPPORT OF THE DIRECT SUPPORT ELECTRICAL SYSTEM TEST SET & NEXT GENERATION AUTOMATED TEST SYSTEM.
12/18/19	808.1	SPRBL1-20-D-0012	IDIQ CONTRACT UNDER SOLICITATION SPRBL1-19-R-0042 FOR THE INTERCONNECTION EQUIPMENT CONTRACT.
2020			
1/13/20	7.7	N00019-19-G-0030	THIS MODIFICATION PROVIDES PROGRAM MANAGEMENT, ENGINEERING AND LOGISTICS SUPPORT TO MITIGATE IDENTIFIED RISKS TO THE DISTRIBUTED APERTURE INFRARED COUNTERMEASURE PROGRAM.

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Date	Award (USD millions)	Contract #	Description
1/27/20	8.7	?	CONTRACT FOR LAUNCH CONTROL UNIT MK 235 MODS 11 & 12 PRODUCTION IN SUPPORT OF THE VERTICAL LAUNCH SYSTEM (VLS). THE LAUNCH CONTROL UNITS ARE USED TO SELECT & ISSUE PRE-LAUNCH & LAUNCH COMMANDS TO SELECTED MISSILES IN THE VLS. THIS ORDER WILL PROVIDE FOR THE FABRICATION, ASSEMBLY, TEST, FINAL ACCEPTANCE & DELIVERY OF VLS LAUNCH CONTROL UNIT MK 235 MOD 11, PART NUMBER 7104280-119, AND MK 235 MOD 12, PART NUMBER 7104280-129.
2/5/20	7.8	N00024-17-C-5200	EXERCISE OPTIONS FOR EVALUATION, IMPLEMENTATION, PROOFING OF EQUIPMENT CHANGES, RELATED ENGINEERING SERVICES & REPAIRS, MODIFICATIONS/ALTERNATIONS & GOVERNMENT FURNISHED EQUIPMENT REPAIR & MAINTENANCE IN SUPPORT OF CEC "BRAVO" EQUIPMENT.
2/19/20	21.5	W15QKN-20-D-0020	MISSION SYSTEM COMPUTERS, CHIEF OF SECTION DISPLAYS & CSD CHARGERS FOR THE M777A2 DIGITAL FIRE CONTROL SYSTEM.
3/18/20	?	N66604-20-D-E005	A \$73,730,343 IDIQ, MULTIPLE-AWARD CONTRACT FOR THE PROCUREMENT OF MATERIALS & SERVICES TO DESIGN, DEVELOP, FABRICATE, TEST, INSTALL, DOCUMENT & DELIVER RAPID PROTOTYPE SOLUTIONS IN SUPPORT OF THE UNDERSEA WARFARE/UNDERSEA DEFENSIVE FAMILY OF SYSTEMS.
3/20/20	206.0	HC1084-20-D-0006	PRODUCTION OF ARMY INSTALLATION KITS.
3/25/20	9.8	W56HZV-16-C-0028	EXERCISE SEVEN JOINT ASSAULT BRIDGE SYSTEMS IN OPTION PERIOD FOUR OF THE CONTRACT.
3/26/20	30.1	N00024-18-C-5395	THIS CONTRACT IS FOR THE MANUFACTURE OF UP TO 59 SPQ-9B RADAR SYSTEMS THAT PROVIDE NAVY SHIPS WITH THE CAPABILITY TO DETECT & TRACK LOW-FLYING, HIGH-SPEED & SMALL RADAR CROSS-SECTION & ANTI-SHIP MISSILE TARGETS IN HEAVY CLUTTER ENVIRONMENTS.
3/27/20	12.3	W56HZV-20-C-0056	TRAILERS, TOOLS & SPARE PARTS.
4/6/20	62.6	N00024-20-C-5605	CONTRACT FOR CONSOLES, DISPLAYS, AND PERIPHERALS (CDP) TECHNOLOGY INSERTION 16, MOD 1 PRODUCTION EQUIPMENT, TO SUPPORT THE NAVY'S FUTURE SURFACE SHIP COMBAT SYSTEMS.
5/1/20	11.8	N00024-17-C-4109	EXERCISE OPTIONS FOR PROCUREMENT OF USQ-82(V) HARDWARE IN SUPPORT OF DDG-51 (GUIDED MISSILE DESTROYER) CLASS NEW CONSTRUCTION, DDG-51 CLASS MODERNIZATION, AND AEGIS ASHORE JAPAN.
5/21/20	26.0	N63394-20-C-0002	EXERCISE OPTIONS FOR LAUNCH CONTROL UNIT MK 235 MOD 11 & MOD 12 PRODUCTION UNITS IN SUPPORT OF THE VLS.
6/3/20	8.8	N00024-20-C-5605	EXERCISE AN OPTION & PURCHASE ADDITIONAL CONSOLES, DISPLAYS, AND PERIPHERALS (CDP) TECHNICAL INSERTION (TI) 16, MOD 1 PRODUCTION EQUIPMENT & SPARES TO SUPPORT THE NAVY'S FUTURE SURFACE SHIP COMBAT SYSTEMS.

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Date	Award (USD millions)	Contract #	Description
6/11/20	120.0	N00019-20-C-0041	PROVIDE NON-RECURRING ENGINEERING TO DESIGN, DEVELOP, INTEGRATE & TEST ENGINEERING DEVELOPMENT MODELS & PRODUCTION REPRESENTATIVE MODELS OF WEAPONS REPLACEABLE ASSEMBLIES FOR THE AAQ-45 DISTRIBUTED APERTURE INFRARED COUNTERMEASURE SYSTEM.
6/18/20	7.9	W56HZV-16-C-0028	CONTRACT FOR SEVEN JOINT ASSAULT BRIDGE SYSTEMS.
7/1/20	250.0	W56KGY-20-F-0077	REPLACE AGING JOINT TACTICAL TERMINALS SCHEDULED FOR END OF LIFE IN FISCAL 2025.
7/20/20	189.8	W31P4Q-20-D-0031	DEVELOPMENT, PRODUCTION, DEPLOYMENT & SUPPORT OF THE MOBILE-LOW, SLOW, SMALL UNMANNED AIRCRAFT SYSTEM INTEGRATED DEFEAT SYSTEM.
7/24/20	10.0	N00024-15-C-5228	EXERCISE OPTIONS FOR THE PRODUCTION OF CEC USG-3B EQUIPMENT SETS & INSTALLATION & CHECKOUT REPLACEMENT COMPONENTS.
8/26/20	24.0	N63394-20-C-0008	CONTRACT FOR PROGRAMMABLE POWER SUPPLY MK 179 MOD 0 PRODUCTION IN SUPPORT OF THE VLS
9/3/20	37.5	N63394-20-D-0005	PROVISIONS TO SUSTAIN THE UYQ-70 ADVANCED DISPLAY SYSTEM.
9/24/20	58.1	SPRA2-20-D-0012	DELIVERY ORDER AGAINST NINE-YEAR ORDERING AGREEMENT FOR IMPROVED BRADLEY ACQUISITION SUBSYSTEM WEAPON PARTS.
9/29/20	7.8	SPRBL1-20-F-0327	DELIVERY ORDER AGAINST A FIVE-YEAR BOA (NNG15SE05B) FOR THE PRODUCTION OF THE MOUNTED FAMILY OF COMPUTER SYSTEMS BLOCK I IN SUPPORT OF JOINT BATTLE COMMAND PLATFORMS
9/29/20	9.1	W56HZV-16-C-0028	FOR JOINT ASSAULT BRIDGE SYSTEMS.
9/30/20	11.6	SPRHA5-20-D-0002	UNMANNED THREAT EMITTER MODULATORS.
10/15/20	10.4	W56HZV-21-C-0055	DIRECT SUPPORT ELECTRICAL SYSTEM TEST SETS.
10/28/20	10.5	N00024-13-C-4229	ENGINEERING CHANGE TO THE ENERGY MAGAZINE PROTOTYPE DESIGN FOR THE DDG-51 CLASS DESTROYER PROGRAM.
12/4/20	211.6	N63394-21-D-0001	IDIQ MULTIPLE-AWARD CONTRACT TO SUSTAIN THE TECHNICAL INSERTION 2016 EQUIPMENT.
12/18/20	10.1	N00019-19-G-0030	THIS ORDER PROVIDES NON-RECURRING ENGINEERING FOR THE DESIGN, DEVELOPMENT & INTEGRATION OF THE AAQ-45 DAIRCM SYSTEM, INCLUDING ASSOCIATED WEAPONS REPLACEABLE ASSEMBLIES IN SUPPORT OF THE HH-60W AIRCRAFT FOR THE AIR FORCE.
2021			
1/13/21	150.0	N00039-21-A-1002	ELECTRONIC EQUIPMENT CABINETS.
1/29/21	55.7	SPRA2-21-D-0014	REPAIR & RETURN BRADLEY WEAPON SYSTEM PARTS.
2/26/21	13.9	N00024-18-C-5395	OPTIONS FOR PRODUCTION OF THE/SPQ-9B RADAR SYSTEMS & ASSOCIATED EQUIPMENT.
3/18/21	8.6	N00024-18-C-5395	EXERCISE OPTIONS FOR PRODUCTION OF THE SPQ-9B RADAR SYSTEMS & ASSOCIATED EQUIPMENT.

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