

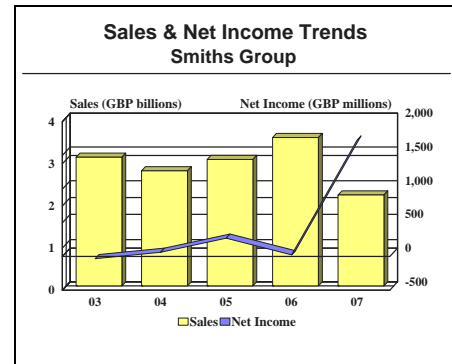
# ARCHIVED REPORT

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## Smiths Group plc

### Outlook

- In May 2007, U.S.-based General Electric (GE) acquired Smiths Aerospace for \$4.8 billion
- Smiths Aerospace now operates as GE Aviation's Systems division
- Smiths' remaining operations focus on detection systems, medical devices, energy, communications, and engineered components
- This report will be archived in 2009, as the company's interest in aerospace and defense is now marginal



### Headquarters

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The company has grown dramatically from the family clock and watchmaking business started by Samuel Smith in 1851. The 1990s witnessed a series of strategic acquisitions that helped to expand Smiths in each of its core businesses. In December 2000, Smiths (then Smiths Industries) merged with TI Group plc to create the Smiths Group plc. Meanwhile, TI refocused its own operations, subsequently bringing to Smiths its

specialized activities in aerospace equipment and mechanical and polymer seals.

Smiths shifted again in early 2007, when U.S.-based General Electric (GE) acquired Smiths Aerospace for \$4.8 billion.

Today, Smiths is focused on the markets for threat and contraband detection devices; medical devices; and energy, communications and engineered components though its five divisions: Smiths Detection, Smiths Medical, John Crane, Smiths Interconnect and Flex-Tek.

The Smiths Group now employs about 20,816 people.

### Structure and Personnel

Donald Brydon  
Chairman  
Philip Bowman  
Chief Executive

John Langston  
Financial Director  
David Lillycrop  
General Counsel

### Product Areas

The Smiths Group manages its operations in the following manner.

1. Medical Systems
2. Detection

3. Flex-Tek
4. Smiths Interconnect
5. John Crane

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**Medical Systems.** The Medical unit manufactures surgical equipment, including sterilizers, surgical instruments, operating room equipment, and single-use disposable and needle-guard devices for safe disposal of hypodermic needles.

**Detection.** This segment produces equipment to detect and identify explosives, weapons, contraband and dangerous substances. Smiths Detection has brought together three world-leading names in trace detection technology – Barringer Instruments, Graseby Dynamics, and Environmental Technologies Group. They gain added strength from a new partner, Smiths Heimann (formerly Heimann Systems), the world's largest supplier of X-ray security equipment. Smiths Detection

products serve the transportation, critical infrastructure, ports and borders, military, and first responder markets.

**Flex-Tek** designs and manufactures engineered components that heat and move fluids and gases for aerospace systems, domestic appliances, and medical devices.

**Smiths Interconnect** designs and manufactures specialized electronic and radio frequency products that connect, protect and control critical systems for the wireless telecommunications, aerospace, defense, space and medical markets.

**John Crane** designs and manufactures seals and associated products mainly for the oil and gas, chemical, pharmaceutical, pulp and paper, and mining sectors.

## Facilities

Smiths Detection, 459 Park Ave, Bushey, Watford, Herts WD23 2BW. Telephone: + 44 192 365 8000. Smiths Detection produces sensitive trace detection systems that are effective against explosives, chemical and biological agents, and drugs.

Web site: <http://www.smithsdetection.com>

Smiths Interconnect, 6400 W Oakton St, Morton Grove, IL 60053, USA. Telephone: + 1 (847) 967-4772

Web site: <http://www.smithsinterconnect.com>

## Corporate Overview

In May 2007, Smiths divested its aerospace operations to General Electric. The current Smiths Group is now organized into five divisions: Medical Systems, Detection, Flex-Tek, Smiths Interconnect and John Crane. They are focused on the markets for threat and contraband detection devices, medical devices, and energy, communications and engineered components.

### New Products and Services

**SABRE EXV.** In June 2008, Smiths Detection launched a hand-held vapor detector for volatile chemicals commonly used in home-made bombs. The SABRE EXV, using Smiths Detection's Ion Mobility Spectrometry (IMS) technology, is a lightweight portable device that can detect and identify explosive substances, including peroxide-based chemicals, in as little as 10 seconds.

**M4 JCAD.** In September 2007, the military unit of Smiths' Detection division was selected to participate in the first major phase of Increment 2 of the Joint Chemical Agent Detector (JCAD) program. Earlier in the year, Smiths Detection was awarded an initial \$3.9 million firm-fixed-price contract to supply M4 JCADs to Increment 1 of the JCAD program. The M4 JCAD is an advanced, non-radioactive chemical point detector

that is designed to help save the lives of troops by automatically detecting, identifying and quantifying both chemical warfare agents and toxic industrial chemicals. The second increment of the JCAD program builds upon Increment 1 requirements, emphasizing detector sensitivity, false alarm rejection, and networking capabilities. The Department of Defense will now evaluate multiple detectors. Initially 10 detectors – five of each configuration – will be procured by the DoD for evaluation. If proven successful following multiple evaluation phases, the long-term potential for the JCAD Increment 2 program is for production of up to 120,000 units for the detector selected.

**NYC Subway Protection.** In April 2007, Smiths Detection was awarded a \$3.2 million contract to engineer and deploy an advanced anti-terrorist system for the State of New York Metropolitan Transportation Authority (MTA). The PROTECT program integrates chemical sensors and security camera systems to help protect the two largest train stations in New York City from chemical attack. The program is funded by the MTA and the U.S. Department of Homeland Security. PROTECT was developed by the U.S. Department of Energy's Argonne National Laboratory following the

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1995 sarin gas attacks on the Tokyo subway. Argonne has collaborated with Smiths Detection-LiveWave on previous PROTECT applications for several other major U.S. transit systems and will provide scientific services for the New York deployment. It was first deployed in Washington, DC, and later expanded into Boston and New York ahead of the Democratic and Republican Conventions in 2004.

**U.S. Military Contracts.** In March 2007, Smiths Detection won several contracts worth a total of \$38 million to supply chemical detection and identification systems to the U.S. military. The contracts include: \$19.25 million for 4,100 Improved Chemical Agent Monitor (ICAM) units (ICAM is a highly effective hand-held device that quickly monitors and confirms nerve and blister agent contamination in personnel, vehicles, equipment and terrain); \$14.2 million for GID-3 chemical agent detectors for the U.S. Department of Defense's Automatic Chemical Agent Detector Alarm (ACADA) program; and \$4.5 million to provide the U.S. Air Force with HazMatID portable chemical identifiers and APD 2000 chemical detection systems.

### Plant Expansion/Organization Update

**New X-Ray Detection Plant.** In July 2008, Smiths Detection opened a production plant in Wiesbaden, Germany, designed to meet the growing global demand for advanced X-ray scanning machines. Much of the output will comprise Smiths Detection's Advanced Threat Identification X-ray (aTiX) systems that are already deployed in major U.K. and U.S. airports such as Heathrow and Washington/Baltimore.

**Specialty Engineering Division Dissolved.** In June 2008, Smiths restructured its divisions, disbanding the Smiths Specialty Engineering division. John Crane, currently managed and operated as two separate units by teams in the U.K. and the U.S., is being unified under Paul Cox as president and will have its headquarters at the Morton Grove facility near Chicago, Illinois. The other Specialty Engineering businesses, Smiths Interconnect and Flex-Tek, will continue to be run from their existing U.S. locations. The presidents of all three businesses will report directly to the Group Chief Executive.

**New North Carolina Facility.** In October 2005, Smiths Aerospace began construction of a new 128,000-square-foot facility in West Jefferson, North Carolina. The new facility will accommodate the increased need for precision-manufactured turbine engine components for all major military and civil aircraft and engine manufacturers.

**Chinese Facility Opened.** In April 2004, Smiths Aerospace opened the first phase of its new 130,000-

square-foot aerospace components manufacturing facility in Suzhou, Jiangsu Province, China. The facility will initially manufacture precision-machined aircraft engine components for the civil marketplace, followed by sheet metal airframe components. It is located in the Export Processing Zone of the Suzhou Industrial Park, located 80 kilometers west of Shanghai. The facility was expected to employ about 100 staff.

**Detection Division Formed.** In August 2003, Smiths created a new division that includes Smiths Detection and Smiths Heimann. The move reflects the acquisition of Heimann and the potential for growth of these two businesses, both previously part of Smiths Aerospace.

### Mergers/Acquisitions/Divestitures

**Triasx Acquired.** In July 2008, Smiths acquired Triasx Pty Ltd, an Australia-based wireless communications components manufacturer, from private owners for an undisclosed cash sum. Triasx expands Smiths Interconnect's microwave business by adding the design and development of complex radio-frequency filter products for the wireless communications market, including the recent development of portable testing devices used to locate interference affecting mobile phone base stations. Triasx has a total of approximately 160 employees located in Brisbane, Australia and Suzhou, China.

**Smiths Sells Marine Systems Unit.** In November 2007, Smiths sold its Marine Systems business to KH Finance Ltd, a company owned by ECI Partners LLP, for GBP52 million, comprising GBP48 million in cash and a deferred payment of up to GBP4 million in cash depending on the satisfaction of certain conditions. Marine Systems, which was a part of Smiths Specialty Engineering, traded as Kelvin Hughes and ChartCo and employed some 330 people, the majority located in Essex, U.K.

**GE Purchases Smiths Aerospace.** In May 2007, GE Aviation completed the acquisition of Smiths Aerospace for \$4.8 billion. The acquisition broadens GE's offerings for aviation customers by adding Smiths flight management systems, electrical power management, mechanical actuation systems, and airborne platform computing systems to GE Aviation's commercial and military aircraft engines and services. Smiths Aerospace has more than 11,000 employees and had \$2.4 billion in revenues in 2006. The combined GE Aviation and Smiths Aerospace revenues in 2006 were \$15.6 billion. Smiths Aerospace now operates as GE Aviation's Systems division.

**CDI Energy Acquired.** In March 2007, Smiths Group acquired CDI Energy Services (CDI) of Tyler,

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Texas, for \$37 million. CDI produces pumping equipment that aids production from oil and gas wells, a technology known in the industry as “artificial lift.” The company has also developed well monitoring and performance improvement services that increase the longevity of customers’ wells. CDI will report to John Crane, which is part of the Specialty Engineering division.

**ETI Technology Acquired.** In May 2005, Smiths Group added to the range of technologies offered by its Detection division by acquiring ETI Technology Inc, a Massachusetts-based privately owned company that specializes in the detection of harmful biological agents. Smiths acquired the business for \$4 million in cash, plus a deferred performance-related consideration up to \$4.5 million. ETI has developed optical sensors that perform initial screening to identify and classify harmful agents. This capability will enhance the equipment used by military forces, by emergency response teams, and in critical infrastructure applications. ETI was formed in 1997.

**Integrated Aerospace Acquired.** In November 2004, Smiths Group completed the acquisition of Integrated Aerospace Inc, a privately owned California-based supplier of specialized landing-gear systems, for \$110 million. Integrated Aerospace is a sole-source supplier of landing gear products for small aircraft including U.S. military helicopters, fighter aircraft, business jets, and unmanned aerial vehicles (UAVs). Examples include the F/A-18 Hornet and Super Hornet and the UH-60 Black Hawk. The company is also a technology leader in external fuel tanks for fighter aircraft and helicopters.

**SensIR Acquired.** In June 2004, Smiths completed the acquisition of SensIR Technologies LLC, a manufacturer of infrared-based analyzers, for a total of \$75 million. SensIR supplies analyzers for the identification of potentially hazardous substances in solid and liquid form. Its products are principally used by military forces and the emergency services, notably first responders, hazardous-material teams, and fire services worldwide.

**TRAK Communications Acquired.** In June 2004, Smiths Group completed the acquisition of TRAK Communications Inc, a designer and manufacturer of microwave subsystems, antennas, and related components, for a cash sum of \$111.5 million. TRAK, with 425 employees and had 2003 turnover of \$71 million, operates from facilities in Tampa, Florida; Thousand Oaks, California; and Dundee, Scotland.

**Dynamic Gunver Technologies Acquired.** In May 2004, Smiths Group completed the acquisition of

specialized aero-engine component manufacturer Dynamic Gunver Technologies (DGT) of the U.S. for a cash sum of \$102 million. A privately owned manufacturer of aerospace turbine engine components headquartered in Manchester, Connecticut, DGT performs complex metal fabrication and develops welding and laser machining and laser welding technology for aerospace applications, principally for U.S. military engines.

**Cyrano Acquired.** In March 2004, Smiths Detection acquired Cyrano Sciences Inc for a consideration of \$15 million plus an earn-out. Cyrano is an early-stage technology company that has developed miniature sensors to detect and identify chemical vapors. The products will be used principally in the defense sector and in counterterrorism.

**Smiths Sells Polymer Business.** In July 2003, Smiths announced the sale of its Polymer Sealing Solutions business to Trelleborg AB of Sweden for a cash sum of GBP495 million. The sale was subject to EU and U.S. regulatory approval. Polymer Sealing Solutions recorded sales in 2002 of GBP378 million, with an operating profit of GBP45 million. The sale was completed in October 2003.

**Smiths Acquires Heimann Systems.** In December 2002, Smiths completed its acquisition of X-ray security systems producer Heimann Systems GmbH for GBP235 million (EUR375 million) in cash. The acquisition of Heimann significantly extends the capabilities of Smiths in the detection and security markets. Heimann’s products inspect luggage and freight to detect explosives and other hazardous or illegal contents, and are primarily used in transportation security. The equipment is also used to inspect mail, and to detect metal or other foreign matter. The newly acquired business is now known as Smiths Heimann. The deal was first announced in October 2002.

**Lodge Business Sold to Meggitt.** In November 2002, Smiths sold its Lodge business, which produces aero-engine sensors, transducers, and industrial igniters, to Meggitt plc for GBP33 million in cash. The deal was undertaken as part of efforts to focus on core operations.

### Teaming/Competition/Joint Ventures

**Smiths GE Detection Venture Canceled.** In September 2007, citing a failure to agree on a strategic vision for the proposed Smiths/GE Detection, the two parties scrapped their plans for a detection equipment joint venture. The deal was first announced alongside GE’s \$4.8 billion acquisition of Smiths Aerospace in early 2007, which was unaffected by the decision. Had the deal gone ahead, Smiths GE Detection would have become the world’s largest security detection operation,

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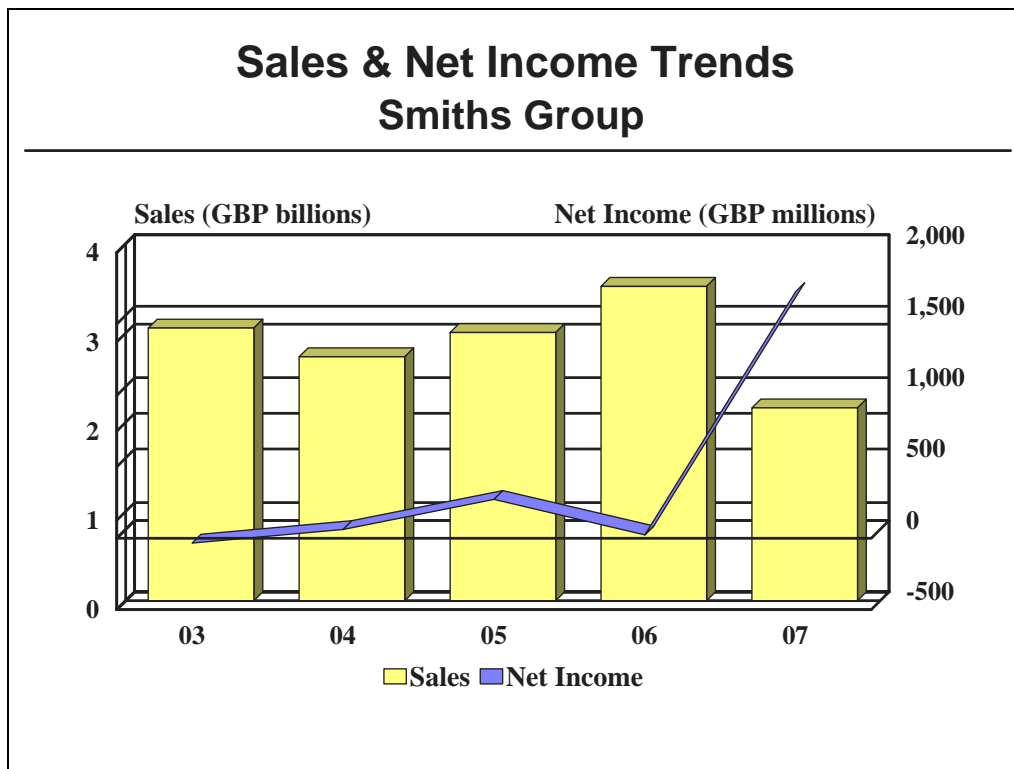
with sales estimated at \$1.1 billion. Despite the collapse of the venture, the two companies will continue to cooperate, each offering complementary products to the airport security sector. Currently the two firms co-

market GE's CTX series EDS machines and Smiths' advanced X-Ray machines for baggage checking at non-U.S. airports.

## Financial Results/Corporate Statistics

For the fiscal year ended July 31, 2007, Smiths Group posted net income of GBP1.7 billion on sales of GBP2.2 billion in 2006. The jump in profit was attributed in large part to the \$4.8 billion sale of Smiths' Aerospace unit to General Electric. The lower income for 2006 was attributed to writing down "the carrying value of the Group's investment in the preference shares in TI Automotive Ltd." The GBP33.9 million loss for 2003 was attributed to the general slowdown in aviation. The U.S. dollar figure in millions is translated as of July 31, 2007, at the rate of GBP1 = USD2.02388. Results have been restated to conform to the company's current presentation.

Y/E July 31	2003	2004	2005	2006	2007	2007
(GBP millions)						<b>USD</b>
Turnover	3,056.1	2,733.4	3,005.4	3,522.9	2,160.9	4,373.4
Retained Profit	-33.9	61.3	271.8	24.2	1,728.1	3,497.5



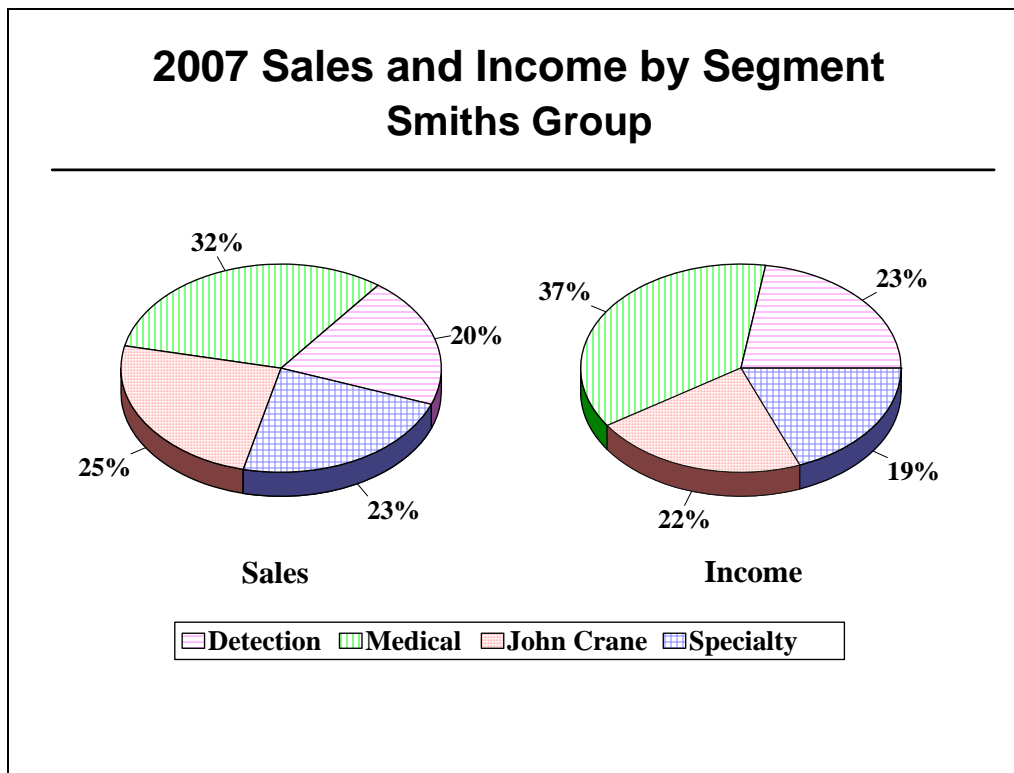
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## Industry Segments

A breakdown of Smiths Group's sales and income by major market segment for the past three years is given below.

<b>SALES</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
(GBP millions)			
Aerospace	1,146.2	1,299.7	-
Detection	366.5	411.8	437.5
Medical	563.3	737.0	690.6
John Crane	463.2	518.4	532.4
Specialty Engineering/Other	466.2	556.0	500.4
<b>TOTAL</b>	<b>3,005.4</b>	<b>3,522.9</b>	<b>2,160.9</b>

<b>OPERATING INCOME</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
(GBP millions)			
Aerospace	119.9	145.8	-
Detection	69.0	81.2	78.6
Medical	57.8	108.5	127.3
John Crane	64.9	74.3	75.3
Specialty Engineering	70.4	75.8	66.6
<b>TOTAL</b>	<b>382.0</b>	<b>485.6</b>	<b>347.8</b>



## Strategic Outlook

With a major presence on Airbus and Boeing programs, Smiths Aerospace has been a strong provider of late. As such, the unit was ripe for divestiture from the Smiths Group portfolio.

U.S.-based General Electric ultimately walked away with the prize after facing a competition that involved some 10 rivals before its \$4.8 billion bid was accepted. What made Smiths Aerospace so attractive was its

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significant investment in its aerospace operations, especially following the merger with the TI Group. That merger gave Smiths critical mass in a variety of airborne systems as well as some strong intellectual properties, such as Dowty.

With aerospace no longer in its make-up, Smiths Group has only one operation that serves defense, detection. In response to the growing terrorist threat and fear of weapons of mass destruction, Smiths created a new Detection unit in 2003 out of its four detection-oriented operations – Graseby Dynamics, Environmental Technologies, Barringer Instruments, and Heimann Systems. This operation offers expertise in the detection of chemical and biological agents and explosives, as well as transportation security systems.

Since its creation, the Detection unit has been strengthened with focused acquisitions. In 2004, the unit acquired SensIR Technologies LLC, a manufacturer of infrared-based analyzers. SensIR supplies analyzers for the identification of potentially hazardous substances in solid and liquid form. In mid-2005, the company acquired ETI Technology, a privately owned U.S. company that specializes in the detection of harmful biological agents.

With such tight management and a clear strategy for the future, the outlook for the new Smiths Group plc remains strong. As it looks ahead, the company is expected to continue its niche acquisitions strategy as it further develops its core operations.

## Program Activity

**Business Interests.** Some important aerospace and government programs currently under way at Smiths are listed below. The briefs are intended to provide a listing of programs that are of major importance to the company. For detailed information on or analysis of specific aerospace and defense programs or equipment, please refer to the appropriate Forecast International binder (for example, *Civil Aircraft, Military Aircraft, Military Vehicles, Warships, Missiles, Electronic Systems, and Aviation Gas Turbines*). The following are the company's business interests:

- Actuators
- Landing gear
- Propeller systems
- Generators
- Armor systems
- Flight controls
- Materials
- Gearboxes

### Aircraft Programs

*In May 2007, GE acquired Smiths Aerospace for \$4.8 billion. The unit is now operated as part of GE Aviation's Systems division, and the following programs now fall under that unit's control.*

#### Actuators

Smiths (formerly Dowty) handles a wide variety of actuators, including the following: for the F-22 ATF it is supplying a side-bay trapeze actuator, a main weapons-bay spoiler actuator, a side weapons-bay trapeze uplock actuator, and a traverse nozzle seal actuator; it is providing a thrust reverser actuation system for the Boeing 777 passenger jet; for the EFA, it is supplying primary flight control actuators and air-

intake cowl actuators; for the MD T-45 Goshawk trainer, it is providing slat lock actuators and the leading-edge slat actuation system; it is providing an impact-resistant actuator and variable stator-vane actuators for Rolls-Royce RB211-524H and Trent engines.

#### Airbus A320/A321

Smiths provides hydraulics, the ram-air turbine, the booster stage bleed valve actuator, the dedicated generator, the ignition relay box, the scavenge valve and variable stator vane actuator (with V2500 engines), electrical components, flexible circuits, the main landing gear door actuator, insulation foam, noise-reduction materials on doors, and repair and overhaul services for the Airbus A320/A321.

#### Airbus A330

Smiths supplies the following systems for the A330 program: flap actuation and transmission system, thrust reverser actuation system, trailing edge seals, insulation foam, noise reduction materials on doors, overspeed governor, and variable stator vane actuation system (Trent engine).

#### Airbus A340

Smiths supplies the following systems for the A340 program: flap actuation and transmission system, thrust reverser actuation system, trailing edge seals, insulation foam, and noise reduction materials on doors.

#### Aircraft Subsystems

Flight management systems, automatic flight control systems, engine control and monitoring systems, flight deck and cockpit displays, attitude and heading reference systems, aircraft instrumentation head-up displays, weapon aiming systems, communications and

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lighting equipment, and data management systems for the following aircraft are made by Smiths Industries Aerospace and Defense group: F-22, C-130, F-4, F-14, F-18, A-6, E-2, C-2, EA-6, F-15, Hawk 100/200, Jaguar, A-7, JA-37, Tornado, EH101, Black Hawk, Sea King, Apache Longbow, all Boeing transports from the 727 to the 777, ATP, A300, A310, A320, MD-10, MD-80, BAe 146, Concorde, F-28, F-50, and F-100. Not all subsystems mentioned above are fitted on all aircraft listed. For example, weapon-aiming systems generally are not installed on commercial aircraft.

### Armor

Armor products produced by Smiths include a detachable ceramic armor for helicopters and polymer-based ballistic and fragmentation systems.

### BAE 748

Smiths supplies the following systems for the BAE 748 program: drive shafts, feathering pumps, gearboxes, governor units, hydraulics, propellers, synchronized units, electrical components, harnesses, communications and control, and repair and overhaul services.

### BAE/Avro International 146/RJ

Smiths supplies the following systems for the BAE 146 program: flap system, hydraulics, aileron and elevator gust damper, spoiler and lift dumper controls, electrical components, harnesses, flight deck lighting controllers, flight-deck master warning system, and electronic control components.

### BAE/Boeing AV-8B Harrier II

Smiths supplies the following for the AV-8B program: fuel flow proportioner, hydraulics, pitch q-feel control unit, burner gallery, digital engine fuel control unit, inlet guide vane control unit, drum switches, electrical components, fan speed sensors, potentiometers, wing landing gear actuator, test equipment, lift improvement device system actuator, and overhaul and repair services.

### BAE Sea Harrier

Smiths supplies the following systems for the Sea Harrier program: fuel flow proportioner, hydraulics, ram air turbine, pitch q-feel unit, engine fuel control system, inlet guide vane control, burner gallery, electrical components, harnesses, throttle grip switch, sonar locator beacon, standby transmitter receiver, and ground support test equipment.

### Beechcraft 400 Beechjet

Smiths supplies the following systems for the Beechjet program: hydraulic package, valve package, master brake cylinder, down lock release cylinder, flap cylinder, and uplock release cylinder.

### Bell/Boeing V-22 Osprey

Smiths supplies the following systems for the V-22 program: rudder flight control actuators, ground test rigs for elevators, flap and rudder flight control actuators, main gear and ramp latch actuators, and hydraulics.

### Boeing 727

Smiths supplies the following systems for the 727: flap gearbox, flap control valve assemblies, rudder trim actuator, door snubbers, leading edge slat and flap actuators, cargo door locking actuators, pressure door actuator, speed brake actuator, swivel assembly, transfer cylinder assembly, ventral stairs actuators and snubber, aileron, auxiliary rudder power control packages, door sequence valve, tail skid actuator, noise reduction kit, and hydraulic units.

### Boeing 737

Smiths supplies the following systems for the 737 program: flap gearbox, hydraulics, rudder trim actuator, auto brake shuttle valve, door snubbers, alternate brake selector valve, elevator centering unit, elevator tab lock actuator, rudder centering unit, transfer cylinder, thrust reverser actuation system, hydraulic flow rate fuse, auxiliary flow rate fuse, auxiliary rudder power control unit, flight and ground spoiler actuators and flight spoilers, A&B modular packages for ground services and systems, isolation system valve, and noise reduction kit, in addition to offering repair and overhaul services.

### Boeing 747

Smiths supplies the following systems for the 747 program: flap gearbox, elevator centering unit, rudder trim actuator, fuel enrichment solenoid valve, engine electronic limiter and dedicated alternator (RB211), auto brake actuator, disconnect clamp, fuel control assembly, mixing box assembly, shield (P&W engines), elevator feel actuator, hydraulic low-rate fuse, nose gear lock actuator, stabilizer trim actuator, noise reduction kit, and insulation foam.

### Boeing 757

Smiths supplies the following systems for the 757 program: power pack, engine bleed valve electronic control unit, anti-skid shuttle valve, auto brake shuttle valve, cowl actuator hand pump, disconnect (anti-skid), door snubber, alternate brake selector valve, cargo door actuators, pressure door actuators (freighter version), volumetric fuse, hydraulics, thrust reverser actuation system (P&W engines), hydraulic flow rate fuse, rudder ratio changer bypass valve, noise reduction kit, and hydraulic-unit overhaul services.



**Boeing 767**

Smiths supplies the following systems for the 767 program: MLG sequence valve and cowl door actuation/reservoir, power pack, anti-skid shuttle valve, auto brake shuttle valve, disconnect (anti-skid), door snubber, main landing gear door, arming lockout, hydraulics, hydraulic flow-rate fuse, and repair and overhaul services.

**Boeing E-3A Sentry**

Smiths supplies the following systems for the E-3A program: aileron snubber, brake deboost valve assembly, cargo door actuators, centering cylinder assembly, door snubbers, elevator snubbers, escape spoiler actuators, pressure door actuator, rudder tab damper, shuttle valve assembly, spoiler actuator, and spoiler modular package.

**EFA**

Smiths supplies the following systems for the EFA program: air intake cowl actuators, primary flight control actuators, digital engine control unit, electrical engine control unit, stick top controller, throttle top grip, master armament safety switch and remote indicator, and insulation foam.

**Engine Controls**

Smiths is involved in the following engine control projects: thrust reverser actuators for the Boeing 777 (all three engines involved); an electronic logic control unit and an electronic belled valve control unit for Rolls-Royce; engine speed limiters for the Rolls-Royce RB211 engine; an afterburner fuel contact unit for the Taiwanese Ching-Kuo fighter aircraft (Garrett engines); the fault monitor/recorder for the P&WC JT15D engine; fuel controls for the F402 engine; digital engine controls for the P&WC PW305 engine; and the electronic control system for an Allison advanced turboprop propulsion system.

**Lockheed Martin/Boeing F-22**

Smiths supplies the following systems for the F-22 program: side bay trapeze actuator, main landing gear door, uplock actuator, main weapons bay spoiler actuator, side weapons bay trapeze uplock actuator, transverse nozzle seal actuator, power piston, and module assemblies.

**Panavia Tornado ADV**

Smiths supplies the following systems for the Tornado ADV program: hydraulics, ram air turbine, airframe presswork, engine intake ramp actuator, radar rotary actuator, wing sweep angle transmitter, electrical components, recce pod actuator, communication control system, nav/attack panel, ground support test equipment, nosewheel steering amplifier, sonar locator beacon, wing slot seal, and afterburner fuel control incorporating vapor core pump.

**Panavia Tornado IDS**

Smiths supplies the following systems for the Tornado IDS program: hydraulics, ram air turbine, airframe presswork, engine intake ramp actuator, radar rotary actuator, wing sweep angle transmitter, electrical components, control handle, recce pod actuator, communication control system, nav/attack panel, ground support test equipment, nosewheel steering amplifier, sonar locator beacon, wing slot seal, and afterburner fuel control incorporating vapor core pump.

**Propellers**

Dowty produces propellers for various applications, including the U.S. Marine Corps' LCAC (Landing Craft Air Cushion), the propeller associated with the Rolls-Royce (Allison) GMA2100 turboprop engine, the Metro III twin-engined commuter aircraft, the Gulfstream JetProp Commander, the Fairchild Merlin IV, the CASA C-212, and the BAe Jetstream 31. It is also doing research in advanced propeller design, including noise reduction.

**Saab JAS 39 Gripen**

Smiths supplies the following systems for the JAS 39 Gripen program: gearbox, hydraulics, auxiliary power unit actuator, electrical components, electronic control unit actuator, and hydraulic monitoring computer.

**Westland Sea King**

Smiths supplies the following systems for the Westland Sea King program: hydraulics, dual input valve for main and tail rotor flight controls, electrical components, standby UHF equipment, sonar locator beacon, electrohydraulic components, winch, and communication control system.

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