

Germany

Europe
January 2020

Country Primer

Political System

The Federal Republic of Germany is a federal republic, with 16 l ander (states). The bicameral legislature consists of the upper Bundesrat and the lower Bundestag. The election in September 2005 brought Angela Merkel of the CDU into power; the President is Frank-Walter Steinmeier since 19 March 2017.

Population

The population of Germany is about 81 million. The population is 95% German; the largest minority are Turks (2.3%). The country is primarily Protestant (45%) and Catholic (37%).

Military Posture

Threat Assessment

Germany had been the focus of attention during the Cold War, with NATO and the Warsaw Pact facing each other down along the West German and East German frontiers. With the fall of the Berlin Wall and the collapse of the USSR, Germany's strategic posture has radically changed. With the absorption of the former Democratic German Republic (DDR), and the withdrawal of the last Russian troops in 1994, Germany has returned to the world stage as a unified state.

German security policy is closely tied with NATO and the European Union. On the one hand, Germany retains strong ties to the US and NATO as a symbol of its rejection of its past; at the same time Germany has been



an enthusiastic partner with France in promoting further unification of Europe as its future. Germany does not currently face any immediate strategic threat, as Russia is now separated from its eastern border by newly independent countries including Poland, Belarus and Ukraine. Nor does Germany face any significant internal security problems beyond lingering terrorist threats.

The lack of serious external threats and the enormous costs inherent in the absorption of the DDR has led Germany to cut back on its defense forces. In the past few years, the emphases in German defense policy have been to promote further integration with its European partners, and to begin to consider Germany's



role in worldwide peacekeeping actions, mainly under the jurisdiction of the United Nations or European Union. Germany first began deploying troops abroad after a 1998 decision to take part in peace-keeping operations in the former Yugoslavia. In early 2006, Germany had 7,700 troops abroad; rising to 9,000 by year's end. Germany had over 5,000 troops in Afghanistan in 2011-2012.

Defense Structure

Federal Ministry of Defense
 Bundesministerium der Verteidigung (BMVg)
 PO Box 1328
 W-5300 Bonn 1
 Germany
 tel: (49) 228 561

Military Attaché in the USA
 Embassy of the Federal Republic of Germany
 4645 Reservoir Rd. NW
 Washington, DC 20007
 tel: (202) 298 4000
 fax: (202) 298 4391 (Defense)

Armed Forces Overview

The German armed forces (Bundeswehr) has an active strength of about 179,000. The conscription period was nine months but was suspended in July 2011 in favor of a program of "voluntary conscription". The Bundeswehr is now in the throes of major reorganization and downsizing.

Germany still has substantial numbers of foreign troops on its soil. Germany is still headquarters for the Allied Land Forces Central Europe (LANDCENT); Allied Air Forces Central Europe (AIRCENT); Allied Land Forces Jutland and Schleswig-Holstein (LANDJUT); and Allied Command Europe Mobile Force (AMF). NATO units deployed in

Germany include Belgium, France, Netherlands, UK and USA. These forces have been steadily declining since 1991. Allied forces finally withdrew from Berlin in 1994, and the last Russian troops departed in 1994. In August 2004, the US government announced plans to substantially reduce the size of US forces stationed in Germany.

Army

The Bundesheer's main combat strength is in its Field Army, which in the early 1990s consisted of three

Corps with 12 divisions (six panzer, four panzer grenadier, one mountain,

and one paratrooper). These were reduced to six divisions in 1994 and more recently to five.

Army Equipment Inventory

<i>Weapon System</i>	<i>Quantity</i>	<i>Source</i>	<i>Notes</i>
Armored Vehicles			
Leopard 2A6	328	FRG	main battle tank; some 2A7 being acquired; 621 inc. tanks in reserve
Wiesel	223	FRG	light airborne armored vehicle
Marder A1/A2	410	FRG	infantry combat vehicle being upgraded to Marder A3
Puma	226	FRG	IFV
Boxer	144	FRG	Wheeled IFV
TPz-1 Fuchs	359	FRG	wheeled APC; includes EW variant, NBC scout vehicle
Fennek	169	Germany	Scout vehicle
Field Artillery			
155mm FH-70	100	FRG	towed howitzer
155mm M109A3G	2	USA	self-propelled howitzer

155mm PzHb 2000	148	FRG	self-propelled howitzer; on order
M270 MLRS	55	USA	multiple rocket launcher
Battlefield Support Weapons			
Milan	1,519	FRG/France	manportable antitank missile
Spike		FRG/Israel	antitank missile
TOW	210	USA	antitank missile (exc. vehicle mounts)
Air Defense			
20mm Rh 202	1,155	FRG	towed air defense gun
Stinger		USA/FRG	manportable air defense missile
Army Aviation			
Airbus Helicopters EC 135T1	14	Germany	transport helicopters
Airbus Helicopters H145M	15	Europe	Kommando Spezialkrafte
Airbus Helicopters Tiger UHT	56	Europe	combat helicopters
Bell 206	6	USA	transport helicopters
Dornier-Bell UH-1D	101	Germany	transport helicopters
NH Industries NH90 TTH	72	Europe	transport helicopters

Navy

The Bundesmarine is headquartered at Glücksburg, with other major bases at Wilhelmshaven, Kiel, Olpenitz and Wamemunde, Eckernforde, Flensburg, and Neustadt have only limited facilities to support the navy's ships. Emden on the North Sea is not a major base, but can be used for operations. The navy has about 27,000 personnel.

The Bundesmarine Fleet Command is organized into seven operational commands: Frigate; Patrol Boat; Mine-countermeasures vessels, Submarine Support Flotillas; Naval Air; Naval Communications-Electronics Command. As in the case of the Bundesheer, the Bundesmarine did not absorb much combat equipment from the former East German

navy, preferring to retire it, or sell it off.

Aside from the major warships listed below, there are numerous mine warfare and support vessels.

The Bundesmarine operates a variety of support aviation units.

Navy Equipment Inventory

Weapon System	Quantity	Source	Notes
Warships			
Type 212	6	FRG	diesel attack submarine
<i>Sachsen</i> Type 124	3	FRG	missile frigate
Type 130	5	FRG	missile frigate
<i>Brandenburg</i> Type 123	4	FRG	missile frigate
<i>Bremen</i> Type 122A	8	FRG	frigate
Gepard T-143A	10	FRG	missile patrol boat armed with Exocet
Naval Aviation			
Lockheed Martin P-3C CUP	8	USA	MPA; acquired from Dutch navy
NH Industries NH90 NFH	1	Europe	transport helicopters
RUAG Do 228-212NG	2	Switzerland	MPA
Westland Lynx 88	22	UK	transport helicopters
Westland Sea King Mk 41	20	UK	transport helicopters

Air Force

The Luftwaffe has about 45,000 personnel. The Tactical Command controls three tactical air divisions and two air defense divisions; there are separate Transport and Training Commands. The Luftwaffe is responsible for strategic national air defense and deploys two air defense divisions. Besides the major aircraft listed below, the Luftwaffe also operates a variety of transport, VIP, and liaison aircraft.

Air Force Equipment Inventory

Weapon System	Quantity	Source	Notes
Aircraft			
Airbus A310-304	1	Europe	
Airbus A310-304 MRTT	4	Europe	tankers
Airbus Military A400M	28	Europe	transports
Airbus Military A400M	3	Europe	outfitted as tankers
Eurofighter EF2000 Typhoon	128	Europe	
Panavia Tornado ECR	30	Europe	EW
Panavia Tornado IDS	74	Europe	
Panavia Tornado IDS(T)	6	Europe	trainers
Sikorsky CH-53G/GS	79	USA	transport helicopters
Transall C.160D	42	France	
Air Defense			
MIM-104 Patriot	200		air defense missile system
MIM-23 I-Hawk	216		air defense missile system
Roland	95		air defense missile system
S-200 (SA-5)			air defense missile system

Paramilitary Forces

The Federal Border Guards of the Ministry of Interior have 24,800 personnel organized into five regional commands. They have armored personnel carriers as well as an aviation force of about 50 helicopters. The German Coast Guard has 11 inshore patrol craft, one inshore tug, and various boats.

Defense Industry

Weapons Development

Ministry of Defense Armament Department
Rüstungshauptabteilung
PO Box 1328
W-5300 Bonn 1, Germany
tel: (49) 228 121

Germany does not have a large RDT&E establishment compared to other major European powers like France or Britain. It's development efforts are on a smaller scale, and frequently are part of multi-national European ventures with the main efforts being undertaken by multi-national firms or by German private companies. Some of the basic research is undertaken by BMVg institutes as well as by the Wehrtechnische Dienststelle (Test Establishments).

Weapons Production

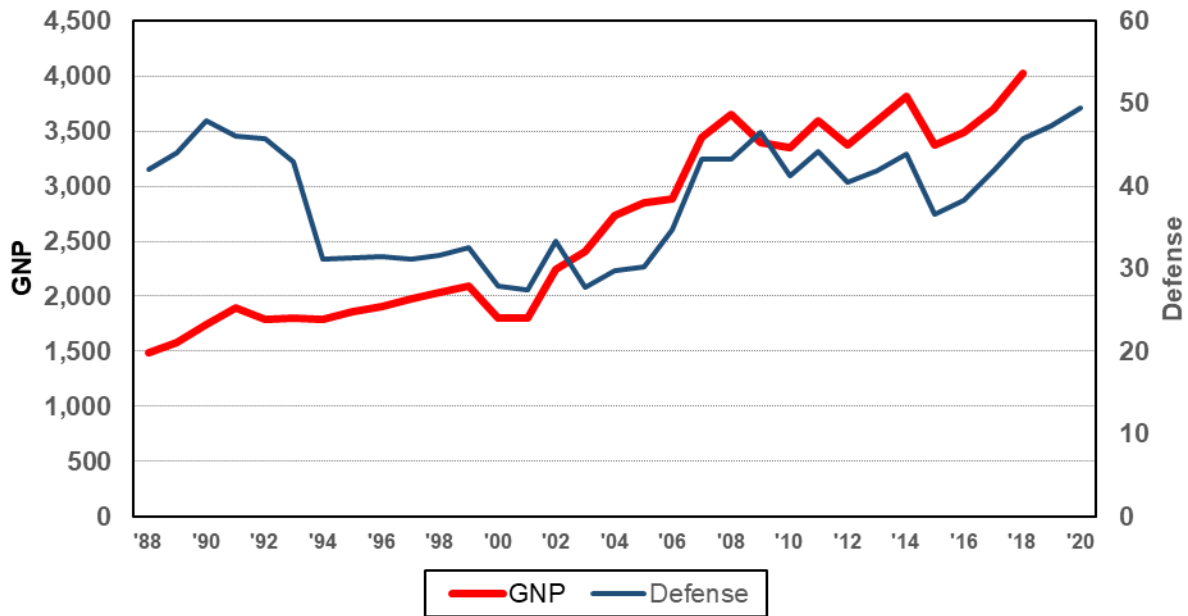
Bundesamt für Wehrtechnik und Beschaffung (BWB)
 Konrad Adenauer Ufer 2-6
 PO Box 7360
 W-5400 Koblenz, Germany
 tel: (49) 261 4001

Germany does not follow the usual practice of major European powers in attempting to develop and manufacture a full range of weapons. In the past, it has relied on the US and multi-national programs for most of its aircraft and missiles. It has been generally self-sufficient in ground equipment and ships, although naval subsystems and weapons have often come from other countries. These procurement practices are gradually evolving with Germany favoring either domestic production, or participation with other European countries. In recent years, German weapon exports have significantly exceeded arms imports. Some of the major German defense firms are as follows:

- Airbus Group—EADS-Germany controlled many of Germany's aerospace firms. DASA (Deutsche Aerospace) was a consortia based around MBB and aimed at making German aerospace more competitive in the European and world market. Eurocopter was a joint venture between Aérospatiale and MBB aimed at satisfying European helicopter requirements including the Tiger armed helicopter program. Eurofighter Jagdflugzeug GmbH was a joint venture between DASA, BAe, Alenia and CASA aimed at producing the new Eurofighter 2000, now part of EADS. The 2014 re-branding of EADS as the Airbus Group will lead to name changes in the German portions of the industry. Airbus Group consists of three main divisions: Airbus (commercial aircraft), Airbus Defense and Space (military aircraft, missiles and space) and Airbus Helicopters (civil and military helicopters).
- Atlas Elektronik GmbH—This is one of Germany's major military electronics firms, involved in sonar, fire control and other electronic systems.
- Blohm + Voss—This is one of Germany's main naval shipbuilding firms, producing a wide range of warships and support vessels.
- Bodenseewerk Geratetechnik GmbH—BGT is Germany's main air-to-air missile firm, working on German versions of the Sidewinder as well as other missile programs. It is now part of Diehl.
- Diehl GmbH—Diehl is one of Germany's main ordnance firms, developing weapons, munitions, missile components and explosive devices, including advanced electronic subsystems for PGMs.
- Eltro GmbH—Eltro is one of Germany's main electro-optics firms, manufacturing night vision equipment.
- Faun GmbH—Faun manufactures heavy-duty equipment, especially large trucks and construction equipment.
- Heckler & Koch GmbH—H&K is one of the world's premier small arms developers and manufacturers and supplies a large percentage of German army requirements.
- Howaldtswerke Deutsche Werft AG—HDW is one of Germany's largest naval shipyards, manufacturing submarines and other warships. It was purchased in 2004 by One Equity Partners, and then repurchased by Thyssen-Krupp.
- IVECO Magirus—Magirus is one of Germany's main manufacturers of trucks and other special purpose vehicles.
- Alfred Kärcher GmbH—Kärcher build field kitchens, NBC protective systems and other military support equipment.
- Krauss-Maffei-Wegmann (KMW)—Krauss Maffei is Germany's main manufacturer of tanks and also builds other armored vehicles and recently merged with Wegmann which produces ordnance systems including tank and armored vehicle turrets. In 2015, plans were announced to merge KMW with Nexter.
- Lürssen Werft—This shipyard is best known for its widely exported missile boats and patrol craft.
- MBDA—EADS (now Airbus Group) controls two separate missile ventures, MBDA formed from BAE Dynamics, Matra Defense and Alenia, and DASA-LFK which combines former German missile firms such as MBB.
- RAM System GmbH—This is the joint venture with BGT, Diehl, MBB and Telefunken, now part of MBDA, develop and manufacture the RAM naval air defense missile.
- Rheinmetall Defence—This is one of Germany's largest defense firms, once known for its ordnance products, but now more broadly diversified including automotive (MAN) and electronics.

- Siemens Defense Electronics—Siemens is Germany’s largest defense electronics firm, producing a wide range of electronic products including radars, computers, radio and communication equipment, C3I and other systems.
- Thyssen Henschel—Thyssen is one of Germany’s main producers of light armored vehicles including the Marder.
- Thyssen Nordseewerke—Thyssen is a major naval shipyard, and among its current programs are the Type 212 submarines.
- Carl Zeiss—Zeiss is a world famous optics manufacturer and produces optical devices and electro-optics for the German armed forces.

German Budget Trends (\$ Billions)



Defense Budget

Government Budget Overview

Currency:	euro (\$ = .91)
Military budget as % of GNP:	1.2%
Avg. annual GNP growth:	~2%
Avg. annual inflation rate	~1%
Average Defense RDT&E (budget %)	3.7%
Average Defense procurement (budget %)	16.4%

(\$ billions, current \$)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Defense Budget	44.5	40.4	44.2	43.1	36.6	38.3	41.8	45.7	47.3	49.4
Gross National Product	3,610.0	3,400.0	3,640.0	3,870.0	3,370.0	3,480.0	3,700.0	4,030.0	n/a	n/a
Foreign Military Sales (FMS) Transactions with USA (\$ Millions)										
FMS Agreements	228.4	386.0	133.2	175.2	340.8	99.3	243.5	n/a	n/a	n/a
FMS Deliveries	159.5	141.8	150.3	163.6	139.3	154.1	105.3	n/a	n/a	n/a

Defense Budget Breakdown by Category

(€ Billions)	2004	2005	2006	2007	2008	2009	2010	2012	2014	2015
Personnel	12.6	12.4	12.1	12.1	16.7	17.2	17.4	17.3	18.7	18.2
O&M	6.08	6.47	6.5	6.37	7.52	8.0	8.4	10.3	6.1	11.3
Proc. (Army)	0.55	0.66	0.71	0.797	1.37	0.972	0.942	1.0	1.0	1.1
Proc. (Navy)	0.51	0.49	0.44	0.485	0.59	0.51	0.47	0.51	0.66	0.151
Proc. (AF)	1.84	1.72	1.75	1.78	2.11	2.19	2.12	2.4	2.2	1.567
Proc. (Other)	1.34	1.23	1.26	1.27	1.7	1.6	1.66	1.3	1.1	1.2
Construction	0.73	0.72	0.79	0.89	0.97	1.04	1.1	0.79	3.5	0.82
R&D	0.99	1.0	1.02	1.2	1.2	1.07	1.1	0.88	0.85	0.895
Total	24.71	24.7	24.6	24.7	31.2	32.6	33.2	34.5	34.4	35.4

Defense Procurement by Category

(€ Billions)	2004	2005	2006	2007	2008	2009	2010	2012	2014	2015
Aircraft	2.24	2.04	2.04	1.9	2.5	2.6	2.55	2.5	1.9	2.07
Missiles	0.132	0.146	0.172	0.178	0.171	0.168	0.164	0.171	0.016	0
Warships	0.687	0.6	0.485	0.529	0.448	0.572	0.572	0.706	0.51	0.045
AFVs	0.119	0.144	0.247	0.223	0.296	0.3	0.32	0.456	0.315	0.474
Artillery & Ordnance	0.304	0.324	0.37	0.081	0.451	0.43	0.4	0.35	0.331	0.301
Mil. Electronics	0.296	0.336	0.437	0.349	0.371	0.497	0.38	0.27	1.0	0.185

FMS Contracts

Below is a listing of all US Foreign Military Sales contracting actions that have been announced since the beginning of FY16 (10/1/15). These actions include the award of, or modification to, prime contracts with a base value of \$7 million or more.

Date	Contract Number	Obligation	Details
<u>Alliant Techsystems, Operations</u>			
03/12/2020	N00019-19-C-0049	\$164,954,564	modification to a previously awarded firm-fixed-price contract action issued by the Naval Air Systems Command to procure Lot Nine, full rate production of Advanced Anti-Radiation Guided Missiles (AARGM). This modification includes the conversion of Advanced Guided Missile-88B High Speed Anti-Radiation Missiles into 253 AGM-88E AARGM all up rounds for the Navy, and two Captive Air Training Missiles for the government of Germany. Work will be performed in Northridge, CA (80%); and Ridgecrest, CA (20%). The contract is scheduled to be completed by 3/31/2023. Program involvement: AARGM, AGM-88.
<u>Boeing, Defense, Space & Security - Missile & Weapon Systems</u>			
04/11/2017	N00019-14-D-0014	\$0	increment as part of an \$8,354,991 modification P00010 to a previously awarded indefinite-delivery/indefinite-quantity contract action issued by the Naval Air Systems Command for engineering, training, support equipment, integrated logistics support, and technical support services for the Navy and the governments of Brazil, Chile, Israel, South Korea, Japan, Australia, Canada, Turkey, United Kingdom, Malaysia, Taiwan, Singapore, Bahrain, Egypt, Kuwait, Oman, Saudi Arabia, United Arab Emirates, Denmark, Germany, India, Netherlands, Portugal and Belgium. These efforts are in support of the Harpoon and Standoff Land Attack Missile-Expanded Response missiles, the Encapsulated Harpoon Command and Launch Systems, the Advanced Harpoon Weapon Control System and the Harpoon Shipboard Command Launch Control System. Work will be performed in St. Charles, MO. The contract is scheduled to be completed by 12/31/2019. Program involvement: AGM-84, SLAM-ER.
12/15/2017	N00019-16-G-0001	\$10,326,551	firm-fixed-price, delivery order against a previously issued basic ordering agreement contract action issued by the Naval Air Systems Command for procurement of Harpoon/SLAM-ER missile system and Harpoon launch systems follow-on integrated logistics and engineering services support for

the Navy; and various foreign military sales (FMS) customers. Work will be performed in St. Charles, MO (91.8%); St. Louis, MO (5.5%); Yorktown, VA (2.6%); and Oklahoma City, OK (.1%). The contract is scheduled to be completed by 2/28/2020. Program involvement: AGM-84.

Boeing, Defense, Space & Security - Strike, Surveillance & Mobility

11/30/2015	N00019-11-G-0001	\$9,018,848	fixed-fee-price delivery order 2067 to exercise an option against a previously issued basic ordering agreement contract action issued by the Naval Air Systems Command for follow-on integrated logistics support/engineering services in support of the Harpoon/Standoff Land Attack Missile-Expanded Response missile system and Harpoon launch systems for the Navy and the governments of Australia, Bahrain, Canada, Chile, Denmark, Egypt, Germany, India, Israel, Japan, Korea, Kuwait, Malaysia, Netherland, Oman, Portugal, Saudi Arabia, Singapore, Taiwan, Thailand, Turkey, United Arab Emirates, and the United Kingdom under the Foreign Military Sales program. Work will be performed in St. Charles, MO (91.8%); St. Louis, MO (5.5%); Yorktown, VA (2.6%); and Oklahoma City, OK (.1%). The contract is scheduled to be completed by 1/31/2017. Program involvement: AGM-84 Harpoon/ SLAM-ER.
01/25/2019	N00019-19-D-0010	\$0	increment as part of a \$13,930,396 cost-plus-fixed-fee, cost indefinite-delivery, indefinite-quantity contract action issued by the Naval Air Systems Command for engineering, training, integrated logistics support, installation/checkout of developed systems and support services for Harpoon Ship Command Launch Control Set, Encapsulated Harpoon Command and Launch Systems, and Advanced Harpoon Weapon Control System, Standoff Land Attack Missile Expanded Response, and Harpoon missiles. Work will be performed in St. Charles, MO. The contract is scheduled to be completed by 12/31/2021. Program involvement: AGM-84, SLAM-ER.

BTAS

06/21/2016	FA8721-13-D-0003	\$8,566,880	increment as part of an \$11,786,566 modification (000330) to exercise the option on a previously awarded contract action issued by the Air Force Life Cycle Management Center for advisory and assistance services knowledge-based, non-engineering support to Hanscom AFB and its geographically separated units. Contractor will provide Professional Acquisition Support Services II program support for development, acquisition, integrations, test, deployment and sustainment in support of research, development and production activities. Work will be performed in Hanscom AFB, MA; Barksdale AFB, LA; Langley AFB, VA; and 5 other locations. The contract is scheduled to be completed by 6/17/2017.
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CAS

07/18/2018	W31P4Q-18-A-0018	\$19,435,773	modification to a domestic and foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for technical engineering services. The contract is scheduled to be completed by 2/28/2019.
02/28/2019	W31P4Q-18-A-0018	\$36,793,076	modification to a Foreign Military Sales contract action issued by the Army Contracting Command - Redstone Arsenal for technical engineering. The contract is scheduled to be completed by 2/29/2020.
02/26/2020	W31P4Q-18-A-0018	\$35,505,220	modification contract action issued by the Army Contracting Command - Redstone Arsenal for technical engineering services in support of the Lower Tier Project Office. The contract is scheduled to be completed by 2/28/2021. RDT&E involvement: 0604114A.

DynCorp International

12/15/2016	W58RGZ-13-C-0040	\$125,533,924	modification (P00146) to a foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for options to exercise of option year three, aviation field maintenance services contract supporting Army Aviation and Missile Command's Aviation Field Maintenance Division continental US operations. Work will be performed in Afghanistan, Iraq, Kuwait, Germany, and Tunisia. The contract is scheduled to be completed by 12/31/2017.
12/29/2017	W58RGZ-13-C-0040	\$17,389,735	modification to a domestic and foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for aviation field maintenance services in support of the Army Aviation and Missile Command, Aviation Field Maintenance Division outside the continental US

operations. Work will be performed in Kosovo, Afghanistan, Iraq, Germany, Honduras and Egypt. The contract is scheduled to be completed by 12/31/2018.

03/12/2018	W58RGZ-13-C-0040	\$17,037,225	modification to domestic and Foreign Military Sales contract action issued by the Army Contracting Command - Redstone Arsenal for aviation field maintenance services in support of the Army Aviation and Missile Command. The contract is scheduled to be completed by 12/31/2018.
03/08/2019	W58RGZ-13-C-0040	\$19,502,855	modification to a domestic and foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for aviation field maintenance services. Work will be performed in Fort Worth, TX. The contract is scheduled to be completed by 6/30/2019.

EaglePicher Technologies

09/26/2019	N68936-19-C-0031	\$5,352,000	increment as part of a \$9,812,000 firm-fixed-price contract action issued by the Naval Air Warfare Center - Weapons Division for 2,200 High-Speed Anti-Radiation Missile thermal batteries for the Navy (1,000); Air Force (610); and the governments of Germany (549); Saudi Arabia (26); and Australia (15). The contract is scheduled to be completed by 3/31/2021. Program involvement: AGM-88 HARM.
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Honeywell International, Defense & Space

01/29/2018	FA8208-07-C-0001	\$31,977,102	increment as part of a \$42,636,136 undefintized contract modification to a previously awarded contract action issued by the Air Force Sustainment Center - Hill for secondary power logistics solution increment one. This modification provides for the performance-based logistical support of ground carts, auxiliary power units, and secondary power for B-2 and C-130 weapon systems. Work will be performed in Hill AFB, UT; and Tempe, AZ. The contract is scheduled to be completed by 11/30/2018. Program involvement: B-2, C-130.
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Intuitive Research and Technology

02/26/2016	W31P4Q-07-A-0015	\$29,058,284	modification (000456) to a foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for support of the lower tier project office missile systems independent integration analysis. The contract is scheduled to be completed by 2/28/2017.
02/28/2017	W31P4Q-07-A-0015	\$7,893,117	modification (000480) to a foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal to procure programmatic support for the lower tier project office. The contract is scheduled to be completed by 2/28/2017. Program involvement: MIM-104.

Lockheed Martin, Missiles & Fire Control

05/18/2017	W31P4Q-17-D-0026	\$13,360,903	cost-plus-fixed-fee foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for post-production support basic labor, includes technical support. The contract is scheduled to be completed by 5/18/2018.
06/15/2017	W31P4Q-17-C-0080	\$171,710,389	increment as part of a \$471,731,858 fixed-price-incentive foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for guided Multiple Launch Rocket System full-rate production 12 for alternative warhead (2,868 rockets); unitary warhead (648 rockets); low-cost reduced-range practice rocket (370 pods); and integrated logistics support. The contract is scheduled to be completed by 7/31/2019. Program involvement: MLRS.
06/26/2017	W31P4Q-17-D-0026	\$16,656,932	increment as part of a \$39,219,294 modification to a foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for PATRIOT Advanced Capability-3 Missile Support Center post-production support for the calendar year 2017 recapitalization of enhanced launcher electronic system, field missile activities, and unscheduled maintenance. The contract is scheduled to be completed by 6/25/2018. Program involvement: MIM-104.
05/23/2018	W31P4Q-17-D-0026	\$282,002,333	modification to a domestic and foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for Phased Array Tracking on Radar to Intercept Advanced Capability-3 Missile Support Center post-production support. The contract is scheduled to be completed by 5/19/2019. Program involvement: MIM-104, ADCAP-3.

02/01/2019	W31P4Q-19-F-0196	\$24,969,700	cost-plus-incentive-fee Foreign Military Sales contract action issued by the Army Contracting Command - Redstone Arsenal for Phased Array Tracking Radar to Intercept on Target, Advanced Capability-3 and Missile Segment Enhancement. The contract is scheduled to be completed by 1/31/2020. Program involvement: MIM-104.
02/28/2019	W31P4Q-19-C-0011	\$33,177,425	increment as part of a \$679,953,928 modification to a Foreign Military Sales contract action issued by the Army Contracting Command - Redstone Arsenal for incidental services, hardware, facilities, equipment, and all technical, planning, management, manufacturing, and testing efforts to produce Phased Array Tracking Radar to Intercept on Target Advanced Capability-3 missiles in both the Cost Reduction Initiative and Missile Segment Enhancement configuration with associated ground support equipment and initial spares. Work will be performed in Huntsville, AL; Camden, AR; Ocala, FL; and 3 other locations. The contract is scheduled to be completed by 12/31/2024. Program involvement: MIM-104.
03/04/2019	W31P4Q-17-D-0026	\$8,469,594	modification to a Foreign Military Sales contract action issued by the Army Contracting Command - Redstone Arsenal for Phased Array Tracking Radar to Intercept On Target Advanced Capability-3 Missile Support Center Field Missile Activities. The contract is scheduled to be completed by 5/31/2020. Program involvement: MIM-104.
01/30/2020	W31P4Q-19-F-0003	\$77,064,274	Foreign Military Sales contract action issued by the Army Contracting Command - Redstone Arsenal for Phased Array Tracking Radar to Intercept on Target, Advanced Capability-3. The contract is scheduled to be completed by 1/31/2023. Program involvement: MIM-104.

Lockheed Martin, Rotary & Mission Systems

05/18/2016	N68335-16-C-0110	\$54,906,126	firm-fixed-price contract action issued by the Naval Air Warfare Center - Aircraft Division for the P-3C Mission System Refresh Program to upgrade the mission computer, acoustic equipment, armament/ordnance system, and displays and controls of eight P-3C aircraft. This effort will include non-recurring engineering, long lead items, design, integration, planning, build, and software development in support of the government of Germany P-3C aircraft under the Foreign Military Sales program. Work will be performed in Owego, NY (58%); Bloomington, MN (30%); Manassas, VA (10%); and Manching (2%). The contract is scheduled to be completed by 3/31/2017. Program involvement: P-3.
08/01/2017	N68335-16-C-0110	\$158,500,000	modification P00006 to a previously awarded firm-fixed-price contract action issued by the Naval Air Warfare Center - Aircraft Division for Phase 2 mission system refresh efforts includes upgrades to the mission computers, acoustic equipment, armament/ordnance systems, and displays and controls on eight P-3C aircraft for the government of Germany under the Foreign Military Sales (FMS) program. It will provide for new mission and acoustic system avionics with a number of German-specific components to satisfy current and future North Atlantic Treaty Organization operational requirements. Work will be performed in Manching (80%); and Owego, NY (20%). The contract is scheduled to be completed by 5/31/2022. Program involvement: P-3.
02/14/2020	N00024-20-C-5310	\$46,607,377	increment as part of a \$233,036,890 firm-fixed-price undefinitized contract action issued by the Naval Sea Systems Command for the procurement of Mk 41 Vertical Launching System vertical launcher module assemblies, modernization kits and spare components. Work will be performed in Baltimore, MD (40%); Indianapolis, IN (36%); Farmingdale, NY (9%); and 8 other locations (15%). The contract is scheduled to be completed by 3/31/2025. Program involvement: Mk 41 VLS.

Northrop Grumman, Mission Systems

09/29/2016	FA8625-16-C-6595	\$27,956,839	firm-fixed-price and cost type contract action issued by the Air Force Life Cycle Management Center - Wright-Patterson for integration and installation of Large Aircraft Infrared Countermeasures on Germany head of state BG5000 aircraft. The contract is scheduled to be completed by 12/31/2019. Program involvement: LAIRCM.
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RAMSYS

12/17/2015	N00024-16-C-5401	\$28,106,269	firm-fixed-price contract action issued by the Naval Sea Systems Command for the recertification of MK-44 Rolling Airframe Missile (RAM) guided missile weapon system rounds. This involves recertification of 342
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Block 1A MK-44 Mod 3 RAM guided missile round pack all-up-rounds. The RAM guided missile weapon system is co-developed and co-produced under an international cooperative program between the governments of the US and Federal Republic of Germany. RAM is a missile system designed to provide anti-ship missile defense for multiple ship platforms. This contract includes options which, if exercised, would bring the cumulative value of this contract to \$34,475,414. Work will be performed in Ottobrunn, Germany (99.4%); and Tucson, AZ (.6%). The contract is scheduled to be completed by 9/30/2021. Program involvement: RIM-116 Rolling Airframe Missile.

06/28/2018	N00024-18-C-5403	\$22,879,100	increment as part of a \$92,315,400 firm-fixed-price undefinitized contract action issued by the Naval Sea Systems Command for fiscal 2018 German Navy's requirements for Rolling Airframe Missile MK 49 Guided Missile Launching Systems (GMLS), and associated shipboard hardware and spares. The Rolling Airframe Missile Guided Missile Weapon System is co-developed and co-produced under an International Cooperative program between the US and Federal Republic of Germany's governments. Rolling Airframe Missile is a missile system designed to provide anti-ship missile defense for multiple ship platforms. This contract will provide for the procurement of 10 RAM MK 49 GMLS, and associated shipboard hardware and spares for the German Navy. Work will be performed in Tucson, AZ (21%); Louisville, KY (21%); and Schrobenhausen (16%). The contract is scheduled to be completed by 9/30/2022. Program involvement: RIM-116 Rolling Airframe Missile, RAM.
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Raytheon, Integrated Defense Systems

10/30/2015	N00024-16-C-5418	\$100,000	increment as part of a \$16,619,241 CPFF contract action issued by the Naval Sea Systems Command for the NATO Seasparrow Missile System Design Agent engineering and technical support. Work will be performed in Portsmouth, RI (94%); Marlborough, MA (3%); and San Diego, CA (3%). The contract is scheduled to be completed by 11/30/2016. Program involvement: RIM-7 NATO Seasparrow.
01/29/2016	W31P4Q-14-C-0093	\$103,057,148	increment as part of a \$212,687,782 modification (P00022) to a foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for engineering services for calendar year 2016 for the PATRIOT program. Work will be performed in MA; Billerica, MA; Burlington, MA; and 9 other locations. The contract is scheduled to be completed by 1/31/2017. Program involvement: MIM-104. RDT&E involvement: 0605456A.
09/29/2016	W31P4Q-16-C-0135	\$35,600,000	firm-fixed-price foreign military sales contract action issued by the Army Contracting Command for PDB-8 kits for US and foreign military sales requirements. Work will be performed in multiple locations. The contract is scheduled to be completed by 11/30/2018. Program involvement: PDB-8.
02/01/2017	W31P4Q-17-C-0073	\$202,185,977	firm-fixed-price, level-of-effort, foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for engineering services for the PATRIOT weapon systems program. Work will be performed in multiple locations. The contract is scheduled to be completed by 1/31/2018. Program involvement: MIM-104. RDT&E involvement: 0607865A.
11/16/2017	W31P4Q-17-C-0073	\$10,158,872	modification to a domestic and foreign military sales contract action issued by the Army Contracting Command - Redstone Arsenal for engineering services for the phased array tracking radar to intercept on target weapon system supporting US and foreign military sales customers. Work will be performed in Andover, MA; Burlington, MA; Huntsville, AL; and Tewksbury, MA. The contract is scheduled to be completed by 12/31/2018.

Raytheon, Missile Systems

05/11/2016	N00024-16-C-5408	\$76,070,200	cost contract action issued by the Naval Sea Systems Command for the procurement of long lead material in support of the multi-year contract for fiscal 2016, 2017, and 2018 Evolved Sea Sparrow Missiles (ESSM) Block I production requirements. The ESSM program is an international cooperative effort to design, develop, test, and procure ESSM missiles. The ESSM provides enhanced ship defense. The contract is scheduled to be completed by 5/31/2018. Program involvement: Evolved Sea Sparrow Missile, ESSM, RIM-162.
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07/24/2017	N00024-17-C-5410	\$11,533,650	modification to a previously awarded contract action issued by the Naval Sea Systems Command for Standard Missile-2 (SM-2) and Standard Missile-6 (SM-6) engineering and technical services to ensure continuity in production, design integrity, and total systems integration of the missile round and its components. The contract is scheduled to be completed by 6/30/2018. Program involvement: RIM-67 Standard Missile, SM-2, SM-6. RDT&E involvement: 0604366N.
12/14/2017	N00024-15-C-5410	\$4,637,552	increment as part of a \$22,578,861 cost-plus-fixed-fee modification to a previously awarded contract action issued by the Naval Sea Systems Command for design agent and engineering support services for the Rolling Airframe Missile (RAM) upgraded MK-31 Guided Missile Weapon System Improvement program. The MK-31 Rolling Airframe Missile (RAM) Guided Missile Weapon System is a cooperative development and production program conducted jointly by the US and the Federal Republic of Germany under memoranda of understanding. Work will be performed in Tucson, AZ (99%); and Louisville, KY (1%). The contract is scheduled to be completed by 9/3/2019. Program involvement: RIM-116 Rolling Airframe Missile.
12/27/2017	N00024-18-C-5407	\$362,382	increment as part of a \$27,278,829 cost-plus-fixed-fee contract action issued by the Naval Sea Systems Command for procurement of fiscal 2018-2022 Navy Standard Missile-2 (SM-2) and Standard Missile-6 depot and intermediate level maintenance, all-up round re-certifications, and special maintenance tasks, and Allied Foreign Navies SM-2 repairs and maintenance. Work will be performed in Tucson, AZ (86%); Camden, AR (11%); and Huntsville, AL (3%). The contract is scheduled to be completed by 12/31/2018. Program involvement: RIM-67 Standard Missile, SM-2, SM-6.
03/23/2018	FA8675-18-C-0003	\$523,148,647	fixed-price incentive modification fixed-price incentive modification contract action issued by the Air Force Life Cycle Management Center - Eglin for Advanced Medium Range Air to Air Missile (AMRAAM) Production Lot 31. This modification provides for AMRAAM Production Lot 32 for the production of the AMRAAM missile and other AMRAAM system items. The contract is scheduled to be completed by 1/31/2021. Program involvement: AIM-120. RDT&E involvement: 0207163F.
04/06/2018	N00024-17-C-5410	\$7,279,329	modification to a previously awarded contract action issued by the Naval Sea Systems Command for Standard Missile-2 and Standard Missile-6 engineering and technical services to ensure continuity in production, design integrity, and total systems integration of the missile round and its components. The contract is scheduled to be completed by 12/31/2019. Program involvement: RIM-67 Standard Missile, SM-2, SM-6. RDT&E involvement: 0604366N.
04/18/2019	N00024-17-C-5410	\$18,979,332	cost-plus-fixed-fee modification to a previously awarded contract action issued by the Naval Sea Systems Command for engineering and technical services in support of Standard Missile-2 and Standard Missile-6 production and development requirements. The contract is scheduled to be completed by 4/30/2020. Program involvement: RIM-67 Standard Missile, SM-2, SM-6. RDT&E involvement: 0604366N.
08/20/2019	N00024-17-C-5410	\$13,248,183	cost-plus-fixed-fee modification to a previously awarded contract action issued by the Naval Sea Systems Command for engineering and technical services in support of Standard Missile-2/6. The contract is scheduled to be completed by 4/30/2022. Program involvement: RIM-67 Standard Missile, SM-2, SM-6. RDT&E involvement: 0604366N.

Sonabysts

08/21/2019	N00178-19-D-4500	\$1,173,145	increment as part of a \$9,440,639 firm-fixed-price, indefinite-delivery/indefinite-quantity contract action issued by the Naval Surface Warfare Center - Dahlgren Division for the maintenance of the Dangerous Waters Naval Simulator to meet its simulation and training requirements, including proper levels of integration and interoperability. Work will be performed in Wilhelmshaven (50%); Virginia Beach, VA (25%); and San Diego, CA (25%). The contract is scheduled to be completed by 8/31/2023.
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Tukuh Technologies

09/01/2016	FA3002-16-D-0016	\$22,000,000	indefinite-delivery/indefinite-quantity contract action issued by the 81st Contracting Squadron for manpower support. Contractor will provide Air
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Force Security Assistance Training Squadron contracted manpower support for administrative, project management, assistant training program manager, and mission training program manager. Work will be performed in Joint Base San Antonio (JBSA)-Randolph, TX. The contract is scheduled to be completed by 8/31/2021.

X Technologies

09/12/2019 FA8213-19-D-0016 \$5,965,414

increment as part of a 9,515,986 indefinite-delivery/indefinite-quantity contract action issued by the Air Force Life Cycle Management Center - Hill for the TTU-595 test sets. This contract provides for the production of TTU-595 Laser-Guided Bomb test sets to functionally check the guidance head of Paveway II and III weapons. The contract is scheduled to be completed by 9/11/2023. Program involvement: TTU-595 Laser-Guided Bomb.

Procurement Programs

Procurement

The table below lists German annual procurement through domestic manufacture as reported in the annual United Nations Register of Arms.

(Units)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Fennek AFV	47	10	—	—	—	—	—	—	—	—
Boxer IFV	—	—	50	69	39	9	—	—	—	10
Puma IFV	—	—	—	—	—	19	37	59	71	72
Wiesel AFV	—	17	—	—	—	—	—	—	—	—
Eurofighter Typhoon	11	17	16	17	13	3	10	5	4	9
Tiger attack helicopter	1	—	7	9	5	7	8	9	10	4
U212 submarine	—	—	—	—	—	—	—	1	—	—
K130 Corvette	3	—	—	—	—	—	—	—	—	—
Taurus missile	120	21	—	—	—	—	—	—	—	—
RBS 15 missile	—	—	6	19	—	—	—	—	—	—

Aircraft

FCAS Future Fighter

In 2017, the Luftwaffe began open discussions about possible replacements for the Tornado fleet under the Future Air Combat System (FCAS). In March 2017, the Luftwaffe requested a briefing from the United States about the F-35 as a possible solution. The defense ministry responded in December 2017 advocating acquisition of more Eurofighters for the requirement. The political response by the Merkel and Macron government was to begin talks over a possible multi-national effort to replace the Tornado with a European design. This seems like more of a long-term solution than the Tornado requirement since those aircraft will begin to be retired around 2025, much too soon for the development of a European F-35 equivalent.

Future Combat Air System is now being used to refer to a future Franco-German fighter effort. It is also called

Système de combat aérien futur (SCAF) by France and New Fighter by Airbus. The aim would be to have a technology demonstrator flying by 2026, a prototype in the early 2030s and first operational aircraft in 2040. The two governments gave their official approval to the program at the ILA air show in Berlin on 26 April 2018. An industrial agreement was signed in June 2019 at the Paris air show.

Eurofighter Typhoon

Germany is one of the main partners in the Eurofighter program. The program is already well over budget, with the initial planned budget of DM5.76 billion escalating to DM9 billion by 2000. The procurement objective fell from 250 to 180, with enough aircraft for four squadrons plus an attrition pool. Germany finally committed itself to procure-

ment in the summer of 1997, although Britain awarded its first production contracts in October 1996. Initial procurement funding was in the 1998 budget. The first service aircraft was delivered in 2002 and the last is scheduled for 2014. Germany has 44 Tranche 1, 70 Tranche 2 and 68 Tranche 3 aircraft planned. The Tranche 2 production contract was scheduled to be signed in July 2004 but this was delayed. Senior executives at Franco-German EADS corporation blamed the UK for holding up the Tranche 2 contract, adding that if no deal was signed before the end of July, the delay could add up to €2 billion in costs. The German parliament approved the Tranche 2 purchase in July 2004.

The first Taifun were deployed with the 73rd Fighter Squadron for training and the first combat aircraft to the 74th Fighter Squadron in mid-

2006. Deliveries in 2006 were 12 aircraft and in 2007 were 6. Deliveries in 2016 were 5 aircraft.

In late 2009, the government announced plans to accept the last Tranche 3B totaling 37 aircraft but made clear that it plans to export them. All 31 aircraft under Tranche 3A will be deployed with the Luftwaffe. There are some plans to incorporate the Austrian order into the German figures which could reduce the number of Typhoons actually exported. The 2010 defense review recommended dropping the planned Tranche 3B acquisition, and the 2011 defense review left the acquisition objective at only 140 aircraft with no Tranche B aircraft. As of 2018, there were 120 in service and a further 8 to be delivered.

NH-90 Helicopter Program

Germany has been one of the main participants in the NH-90 transport helicopter program. Its original procurement objectives were stated to be 264 helicopters (30 TFH-90s for the Bundesmarine, 114 TTH-90s for the Luftwaffe and 120 TTH-90s for the Bundesheer). The Bundeswehr planned to order 118 NH 90s between 2003 and 2009 and a total of about 60 naval MH 90s. Funding for procurement began in 1996. The contract for the NH-90 program signed in July 2000 included 134 army and air force NH-90 helicopters for Germany. The eventual procurement objective was 215 helicopters. The initial army portion of the order 50, followed by another 30 after exercising a contract option in 2007, bringing the total to 80. The 2006 air force requirement was pegged at 42 NH90 and the navy has a requirement for 30 MH90 which have not been ordered to date. The Luftwaffe had planned to allot 12 of its NH-90 to the SAR role but attempts to integrate suitable systems to the airframe were unsuccessful and there have been discussions of acquiring these separately. In March 2013, Germany trimmed its army acquisition objective from 122

to 82 aircraft. However, the Bundesmarine added an order of 18 NFH90, so the final total of Germany dropped to 100. Delivery has been badly behind schedule with only 33 in operation in early 2015. An audit of the program has led to calls for a possible drop in the objective to 80 with 18 of these the naval "Sea Lion" version. First delivery of the Sea Lion was expected in 2018. As of 2018, there were 53 army TTH in service with 19 more to be delivered; all 18 naval NFH are to be delivered.

In 2019, the Bundesmarine selected the NH90 as the replacement for its Sea King, with 31 to be ordered.

Uhu/Tiger Armed Helicopter

Airbus Helicopter (formerly EADS, Eurocopter) is currently manufacturing the Tiger armed helicopter for French and German requirements. German plans originally were pegged at 122 helicopters, which they now call Uhu (Owl) and these were ordered in 2001-09. Due to the cutbacks in the 1997 defense budget, defense minister Volker Ruhe ordered a postponement in the decision on the procurement of the U-Tiger until 1998. France and Germany signed the original production contract for 80 Tigers in June 1999. As of mid-2002, the procurement objective was pegged at 110 helicopters but since then has been trimmed back to 80 and the 2010 defense review recommended trimming it to 40. The first production helicopter was delivered in March 2002. Plans called for having 50 in service by 2006 which has slipped; there were only five on service as of mid-2007. Deliveries in 2006 were only one Tiger and three in 2007, with total deliveries of only 11 by early 2013. In March 2013, the German government trimmed the order from 80 to 57, with plans to put 40 in operation and use the remainder for spares. Forty-nine Tigers were delivered in 2007-2016. As of 2018, 58 were on inventory with 2 to be delivered.

Heavy-lift Helicopter

The German and French governments began discussions with Boeing in the summer of 2001 over their requirements for a heavy lift helicopter, potentially based around the CH-47F design. Eurocopter has proposed developing a new Heavy Transport Helicopter, but discussions have also been undertaken with the US about possible co-production of an upgraded CH-53 or follow-on. Recently, Germany has decided to embark on a CH-53 modernization program to extend its service life to 2025. In October 2018, the heavy-lift helicopter acquisition was put on hold, only to be revived in November. The requirement is for 60 helicopters and the CH-47E and CH-53 are expected to be the competitors. The decision is expected in 2020 with an order for 44-60 helicopters and deliveries starting in 2023.

Light Helicopter

The German MoD released a White Paper in January 2016 outlining future acquisition plans. One of the few new-starts in the plan is a light utility helicopter, with preference for an off-the-shelf acquisition.

A400M Grizzly Transport

Germany had been one of the supporters of European efforts to develop a C-130 Hercules equivalent. The 1992 defense plan included provision for the Future Large Aircraft beginning in 1999 with DM 1.2 billion. Due to the cutbacks in the 1997 defense budget, development of the Future Transport Aircraft/FLA was not covered in the medium term (1997-2000) budgets. In June 2000, Germany formally announced plans to participate in the A400M venture with a requirement for 178 aircraft. This objective was trimmed back in more recent defense budget projections to 73 aircraft at a cost of DM 12 billion, but the recent budgets contain funding for only 40 aircraft. The German parliament did not agree to fund the 40 aircraft until March 2002 and

put off signing up for the additional 33 aircraft until after the September 2002 elections. Germany committed to 60 aircraft at an expected cost of €8.3 billion with deliveries starting in August 2010 and continuing to 2016. The problems plaguing the A-400M program have led to some doubts whether the program will proceed,

and if it does proceed, whether the signatory countries will acquire the total number of aircraft originally planned. One compromise suggested in 2009 was that the countries would maintain their funding obligations but receive a smaller number of aircraft than planned. As of the 2011 defense deliberations, the objective was

cut from 53 to 40 aircraft. Germany plans to sell off the surplus 13 aircraft. Deliveries through June 2016 were three aircraft.

As of 2018, 18 were in service with 35 to be delivered.

Missiles

MEADS

In 2011, Germany and the US decided to end the air defense missile program once RDT&E is complete and not to proceed to the procurement phase. However, in 2015, Germany revived the program with plans to award a procurement contract in 2017; this date has slipped until 2020 at the earliest.

TriGAT Antitank Missile

The Third-Generation Antitank Missile, or TriGAT, is a new family of anti-armor missiles being developed by France, Germany, and the United Kingdom for deployment in the mid- to late-1990s. The program is being managed by Euromissile Dynamics Group (EDMG), an international consortium. TriGAT is to be produced in two versions: a short/medium-range manportable system, called the TriGAT-MR (a.k.a. PARS-3 MR in German) and a long-range variant, the TriGAT-LR (a.k.a. PARS-3 LR in German). The -MR completed development and is to enter series production in 1998, while the -LR version was scheduled to be operational around 1999. The UK pulled out of the TriGAT program in 2000, raising serious questions of its viability. Some German firms have begun marketing a locally produced version of the Israeli NT Spike ATGM, and the US Javelin is another likely candidate. Germany is already acquiring the Spike NT for some requirements.

Due to the cutbacks in the 1997 defense budget, defense minister Volker R  he ordered a postponement in the decision on the development of

the TRIGAT 3 long range anti-tank missile. Several participants in the program have pulled out, including France, the UK and the Netherlands, though the Germans have insisted that they will stick with the program. The TriGAT-LR was recently listed as the armament for the Tiger helicopter, but the production requirement is so small that missile costs may prove to be excessive. Germany made a commitment to acquire about 200 of the missiles in June 2006 at a cost of €200 million.

Meteor AAM

The Luftwaffe acquired 328 AIM-120 AMRAAMs from the US to rearm its F-4F Phantoms, down from original plans for 400. Germany has ordered 96 AMRAAMs and further procurement is in doubt. BAe was developing the S.225 with Sweden as an alternative to AMRAAM, but in 1994, DASA announced it was planning to develop its own contender, called the A3M. In 1996, DASA agreed to join a multinational effort called Meteor to develop an AMRAAM equivalent. In 2000, Britain selected the Meteor for its future requirement, tied to German assurances of participation in the program. Germany was planning to acquire 480 Meteor starting in 2011 but the 2010 defense review recommended cutting this total.

IRIS-T Missile

IRIS-T (IR Imaging Sidewinder-replacement with Tail-control) is the first stage of a German effort to field a new short-range air-to-air missile to replace the AIM-9 Sidewinder. The

IRIS seeker was originally developed as a possible AIM-9 upgrade, but in 1994, the Luftwaffe decided to opt for a whole new missile with a new engine and airframe. The program began the definition phase in 1996 and will transition to a 54-month engineering phase in 1997. Current plans are to field the new missile by 2002. Germany is currently trying to strike an agreement with Canada, Denmark, Greece, Italy, Norway, Portugal, and Sweden to co-develop the missile as a Sidewinder replacement. The prime German contractor is BGT. The German requirement was for 2,560 missiles with 912 to be ordered in 2002-2009, now reduced to 1,250 IRIS-T short range AAM at a cost of €550 million.

German UAV Programs

The Eurodrone Brevet/Tucan was a cooperative Franco-German effort to field a reconnaissance UAV for divisional surveillance and artillery spotting requirements by the end of the decade. The program has suffered from funding shortfalls and production was delayed with, France backing out of its commitment to the Brevet in the late 1990s. Germany has acquired six Tucan systems of 10 drones each. Germany is considering adopting at least two other versions of the system, the Taifun, an anti-radar drone, and the Mucke, a communications jammer version. Due to the cutbacks in the 1997 defense budget, defense minister Volker R  he ordered a postponement in the decision on the development of the army Taifun UAV. The army has also acquired a number of low-cost Luna

UAVs which were used in Kosovo. Germany is also acquiring other mini-UAVs such as the Aladin.

Germany was also examining a ship-based UAV system under its SEAMOS program for the K-130 corvettes, but with the cancellation of SEAMOS will have to look at other options. Germany has begun acquiring the small Schiebel Camcopter for this role.

Germany has begun the acquisition of Global Hawk UAVs, called locally Euro Hawk, with a local sensor payload which will be used primarily in a SIGINT role. The program cost is expected to be about €650 million. The first aircraft was delivered in 2009, but the program was subsequently cancelled amidst

considerable controversy. The program was revived in 2015 with plans to acquire the navalized MQ-4C Triton version.

Germany has been leasing Israeli Heron UAVs for operations in Afghanistan, and is expected to acquire an off-the-shelf MALE UAV, the Heron TP, over the next few years.

Taurus Stand Off Missile Requirement

In June 1992, Germany selected APACHE Anti-Piste to arm its Tornado aircraft under the MAW (Modular Abstand Waffe) requirement. Germany had a requirement for approximately 545 Apache-MAW with initial delivery in 1997, followed by

a second batch of 655 after 2009. Due to the cutbacks in the 1997 defense budget, procurement of the (MAW/ Apache) 1.1 (anti-runway) and 1.2 (area denial) were cancelled in the medium term (1997-2000) budgets, and Germany instead turned to the TADS/Taurus venture with Sweden. The German government provided the consortium with a development contract for the Taurus version in April 1998. The first powered flight test was conducted in October 1999. The German parliament approved production in 2002, and a €570 million production contract was awarded in August 2002 for 600 missiles with production beginning in November 2004. A total of 480 missiles were delivered in 2006-2010.

Armored Vehicles

MRAV Boxer Wheeled IFV

The MRAV (Multi-Role Armored Vehicle) was developed by a new international consortium called ARTEC which consists of KMW (Krauss-Maffei-Wegmann), MAK Systems, Alvis and Stork. It was at one time envisioned as a multinational design to satisfy German, British, and French requirements. The MRAV began as a French and German requirement for a future generation of armored infantry transporters. Although France pulled out in favor of a GIAT program, in April 1997, the Netherlands announced plans to join the MRAV program, based in part on the success of German/Dutch cooperation on the Fennek scout vehicle. The first MRAV demonstrator was completed at GKN in the UK in mid-June 1998. In early 2001, the UK began to study plans to reorient its future AFV requirements under the new title FRES (Future Rapid Effects System) with a requirement for 1,500 vehicles. This could combine the MRAV with other requirements such as the Tracer reconnaissance vehicle test-bed effort being undertaken with the US. In May 2003, Britain announced it would withdraw from

the MRAV program, although it has continued to fund development.

In early 2006, the German government received assurances from the ARTEC consortium that costs would be kept down, so plans have shifted to an initial tranche of 272 vehicles in three baseline versions: 135 APC, 65 command and 72 ambulances. In December 2006, the German parliament confirmed the purchase. Initial deliveries were made to the Bundeswehr in 2009. In late 2011, the German army decided to acquire all Boxer in the so-called "Afghan" configuration which has a variety of upgrades including an IED jammer, improved protection against IEDs and a remote-control weapon station. This was introduced from vehicle No. 41 and on, and was retrofitted to earlier vehicles. In December 2015, Germany ordered a further 136 Boxers for delivery in 2017-2020 on top of the 192 previously delivered. These are in the APC configuration are intended to replace the earlier Fuchs vehicles.

Puma Infantry vehicle

Germany had a long term requirement for a future infantry vehicle to replace the Armored Vehicle 2000

program that was cancelled. Originally dubbed NGP (New Gun Platform), and then Schutzenpanzer 3 Panther, the program was again killed in July 2002 as being "too national" and too costly. In the meantime, the Bundeswehr was considering updates to the Marder IFV as an interim solution. An upgraded Marder called Marder 3 was displayed in 2000, and a new IFV program was dubbed Igel. The program has been reconfigured again, now called Puma with a prototype delivered from a consortium of Rheinmetall and Krauss-Maffei in December 2005. The army has a requirement for 410 of the vehicles. On 8 November 2007, the German parliament approved a procurement program for 405 Puma by the Projekt System Management GmbH consisting of the Krauss-Maffei Wegmann and Rheinmetall Landsystem team. A contract was awarded to the team on 6 July 2009 at a cost of €3.1 billion (\$4.3 billion). Initial delivery of the first of nine battalions is expected in 2014. In July 2012, the procurement objective for Puma was cut from 405 to 350 vehicles. The first production Puma was delivered in June 2015.

Leopard 2 Upgrades

The Bundesheer currently operates the Leopard 2A6 after having retired earlier variants. In April 2015, plans were announced to increase the size of the force from 225 to 328. Germany received the first 20 Leopard 2A7 in December 2014 and may upgrade the rest of the fleet. A contract awarded in September 2017 will upgrade 104 Leopard 2 to the Leopard 2A7V configuration.

Initial work on a successor began in 2015 and this is expected to be merged into a joint Franco-German effort later in the decade.

Dingo Protected Vehicle

Germany has selected the Krauss-Maffei-Wegmann Dingo for its requirement for a lightly protected vehicle for peacekeeping operations. The baseline vehicles are built on a Unimog U1550L 4x4 chassis but there are plans to field a Dingo 2 on the Unimog U5000 chassis which is available either in a 3.25 m wheelbase configuration like the Dingo 1, or on an extended 3.85m wheelbase which is more suitable as a troop carrier. Germany planned to order the first batch of 52 in 2004, followed by options for up to 1,600 more vehicles. The German government subsequently ordered three batches of the follow-on Dingo 2 (52+149+43) and most recently in March 2010, the German BWB awarded KMW another contract for 41 Dingo 2 APVs and in April 2010 for 44 Dingo 2 APVs configured for battlefield recovery; this brings orders to date for

the Dingo 2 to 340 vehicles in all configurations.

Germany's future requirements are called GFF (Geschützte Führungs- und Funktionsfahrzeuge: Fire Control and Operations Vehicle). This comes in four weight/protection classes, the GFF 1 through GFF 4. The Bundeswehr has already selected the Swiss MOWAG Eagle IV for an initial tranche of 160 vehicles with an eventual objective of 486 vehicles. In July 2008, the Bundeswehr ordered 20 Mowag Eagle IV protected vehicles based on an immediate requirement and followed this up in November 2008 with an additional order for 173 vehicles. In January 2011, the government placed an order for an additional 195 Eagle IVs and an additional 76 Eagle Vs in March 2014.

A team of Rheinmetall and Krauss-Maffei-Wegmann was trying to interest the Bundeswehr in a domestic design, the AMPV (Armored Multi-Purpose Vehicle) with a mock-up being shown at Eurosatory 08 and a more refined version at Eurosatory 10. The plan is to build it in two configurations, Type 1 and Type 2, roughly corresponding to the GFF 1 and GFF 2 requirements. Another contender on display was the ACS (Armored Car Systems) LAPV II/Enok II which is an armored version of the Mercedes Benz G-model light truck. GDELS has responded by offering its Next Generation Eagle which debuted at Eurosatory 10, armed with the Bofors Lemur remote control weapon station. This is similar in size and appearance to the current Eagle IV, but has higher gross-weight, greater internal volume and

greater protection. It is also being offered in a 6x6 configuration and with a variety of protection and weapons packages.

Rheinmetall unveiled its GEFAS (Geschütztes Fahrzeug Systeme) at Eurosatory 2006 in mock-up form, and the actual prototype was on display in 2008. This is basically a light AFV a bit larger than a HMMWV intended to protect troops against IEDs. However, it is quite heavy, coming in at 17.5 tonnes. The vehicle is designed to fit within standard transport aircraft such as the C-130 and A-400. Krauss-Maffei-Wegmann displayed a pilot/technology demonstrator of a similar armored light truck called the F2. The design like GEFAS is modular with various configurations weighing 15 to 24 metric tons.

In 2013, Germany decided to acquire 100 Eagle V vehicles for the remainder of the GFF Class 2 requirement.

Artillery Modernization

KMW's Panzerhaubitze 2000 self-propelled 155mm gun is the centerpiece of German artillery modernization. Plans called for procuring 185 guns in 1998-2004 with a long term objective of 594 systems. An initial production contract was awarded to Wegmann in early 1996. The official hand-over of the first service vehicles was on 1 July 1998. Through June 2000, about 80 had been delivered and by 2008, 180 were in service. Italy was the first export customer for the gun. Germany planned to retain about 300 M109A3G, which will be upgraded.

Ordnance

German Army Equipment Requirements

The recent shift in emphasis away from heavy mechanized forces and towards light mobile units is expected to be reflected in future procurement programs. There are currently plans underway to completely

revamp the German uniform including a new light Kevlar helmet, Goretex camouflage clothing, improved protective vests, and new small arms in NATO 5.56mm caliber are being procured. Rapid-response forces will be the first to receive the new equipment and other units will be equipped after the year 2000.

Future Soldier System

The Bundeswehr has embarked on a future infantry program originally called "Der Infanterist der Zukunft" (IdZ). The program was initiated in 1999 when the Bundeswehr realized it was falling behind other NATO armies. The program took place in

three phases: an immediate procurement effort to acquire needed systems on an ad hoc basis for urgent requirements; an intermediate package deploying elements of the system in 2004; and an optimal package to be ready around 2008 including elements with higher technological risk or more advanced technology. The basic elements of the program were

approved on 10 July 2001. An initial contract for 100 IdS-BS (Basic System) was awarded to EADS with the first 50 systems being delivered to the ISAF contingent in November 2004, and the remainder in 2006-2007. A contract for 1,000 "Gladius" IdZ-ES (Erweites System-Extended System) was ordered from Rheinmetall defense Electronics in

August 2006 for delivery in 2009-2015. The Bundesheer is expected to consider extending acquisition after 2015 once an evaluation is made of the effectiveness of the system in use in Afghanistan. In 2015, the Bundesheer announced plans to retire the G36 assault rifle in favor of a new design.

Naval Systems

Type 125 Baden-Wuerttemberg Frigate

The Bundesmarine sought parliamentary approval for the new F125 frigate class in the 2006 budget with an aim towards commissioning four of them starting in 2012 at two year intervals with final delivery in 2019. The new frigate will be designed primarily for "stabilization" missions, that is, overseas peace-keeping operations and maritime interdiction. The initial batch of four frigates are expected to cost €2.2 billion. A €2 billion contract was awarded to ARGE F125 consortium headed by Thyssen Krupp Marine Systems in late 2007 for the construction of the four frigates. Delivery of the first two ships was scheduled for completion in 2017, and the next two ships of the class in 2019. This schedule slipped with the first delivered in June 2019, a second later in 2019 and the final two scheduled for 2020.

Type 130 Braunschweig Corvettes

The German navy has a stated requirement to replace its Type 143 and Type 143A missile boats with the new Type 130 with initial deliveries in 2007. A total of 15 in three batches was planned and these would replace the entire inventory of fast missile boats now in service, but this was trimmed back to only five in 2000. In July 2000, the defense ministry selected Blohm+Voss for the project, awarding the firm a contract for DM1.9 billion (\$925 million) for the

five lead ships. The five were to be delivered in 2007-2008 but this was delayed with two being delivered in 2007 and the last in 2013. There have been associated funding problems with the missile systems for the ship and delays in ordering the associated RBS-15 missile from Sweden.

In October 2016, plans were announced to purchase five more K130 corvettes to make up for the shortfall caused by delays in the MKS 180 program. Plans are to deliver two ships in 2019 and the remaining three by 2023. This was held up in 2017 after the Federal Cartel Office ruled that the new procurement would require the contract to be re-bid. The sixth ship of the class, the Koln, was laid down in 2019 with delivery expected in 2024.

Type 131 (Multi-Purpose Combat Ship 180)

The Bundesmarine began design studies for the K131 Medium Surface Combatant with a plan to eventually acquire four of this new class, now called MKS 180, down from the original plan for six. There was a two-year tendering phase from 2015 to 2017 between three competitors. In October 2016, the government announced that another six months was needed to select the final design. Recent plans expected to award a construction contract in 2017 but does not anticipate first delivery until 2023. The slow pace of the program prompted the Bundesmarine to order

additional K130 corvettes. The recent budget plans put off the final decision on the program until 2019, with the program expected to include four ships with an option for two and a cost of €3.9 billion with a lead ship delivered in 2023.

Type 212 Submarines

The Bundesmarine is currently procuring the Type U 212A class submarine to replace its earlier Type 206 and 205 classes. They are being built by the Howaldswerke in Kiel and Thyssen in Emden. A total of 12 had been planned, with the first entering service in 1997, however, the first production tranche was only four boats. The unit cost was placed at DM650 million and the fourth submarine entered service in 2007. A second tranche was ordered in September 2006 with delivery in 2012-13.

There have been some discussions about the Bundesmarine acquiring a Type 214 boat ordered by Greece which the Greek navy has refused to accept.

Berlin Combat Support Ship

In December 2008, the Bundestag approved acquisition of a third *Berlin* class combat support ship at a cost of €330 million (\$425 million) which would enter service in 2013.

In July 2019, the Bundesmarine selected the Type 707 for its new replenishment tank requirement to replace the Type 704 class.

Space Systems

Surveillance Program

Germany's SARLupe radar imaging satellite was put into orbit on 19 December 2006 by a Russian Cosmos-3M from Plesetsk; the second and third were launched in July and November 2007 and the fifth and last was orbited on 22 July 2008. The core sensor was developed by Alcatel Alenia Space and the prime contractor for the network is OHB System in Bremen. The system offered limited capability by December 2007 and was declared fully operational on 1

October 2008. In 2015, plans were announced to develop a follow-on system, currently called SARah. Germany has an agreement with France and Italy over shared imagery, with Germany receiving access to the French Helios 2 optical imagery satellite.

Germany is a partner in the future MUSIS (Multinational space based imaging system) with France, Belgium, Spain, and Greece with France responsible for the optics portion. Italy and Germany are responsible for the radar portion. The plan calls for

the launch of three satellites in 2015-2018.

Military SATCOM Program

Germany selected a team led by EADS as the preferred bidder for its new SATCOM BW Stage 2 program in April 2005. The team includes ND Satcom and Alcatel Alenia Space. The program is pegged at €940 million.

Teal Group Analysis

The Merkel administration has not made any major shifts in defense policy, though the absence of the Greens from the government has made it easier to push through many of the planned defense programs. The inability of Merkel to form a new coalition government in late 2017 and early 2018 led to continued delays in approving several defense programs.

Germany has been slow to reorient its force structure to accommodate new global realities, and in spite of its avowed desire to play a greater role in international peacekeeping since the 1999 policy change. It has been hamstrung from doing so by budget limitations and the constraints of its legacy forces. The CDU planned some increases in defense spending, but the budget over the past few years has been flat except

for plus-ups needed for the Afghanistan mission. In 2016, the government announced plans for a fifteen-year procurement effort cost €150 billion. This would be a significant increase since the procurement budgets over the past decade have averaged less than €650 million.

German future procurement programs are still weighted towards legacy missions in Europe. Eurofighter Typhoon/Taifun has little immediate role in overseas commitments as it is a dedicated interceptor with no ground attack capabilities until the third production batch. Had it been available for the Kosovo crisis in the past decade, it would have played little significant role and it is hard to foresee what role it will play in missions such as Germany's recent role in Afghanistan. The same applies to other weapons systems developed for

Cold War needs such as the Tiger attack helicopter, the U-212 submarine, and the Puma IFV. The government has still not signed a contract for the MEADS, with the decision being pushed back repeatedly and not likely to be signed until 2020 or later. Mobility enhancements such as the A-400M are still several years away, and Germany has been forced to adopt hasty improvisations such as the Dingo/Eagle protected vehicle program to permit its limited overseas deployment. The slow pace of procurement reorientation has been forced on the government by the recognition that an abrupt change in these programs would have significant economic consequences in the defense and aerospace industry that have already been hard hit over the past decade by the massive cuts in the wake of the Cold War.

Forecast

Defense Budget Forecast

(\$ Billions)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
R&D	1.8	1.9	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.1
Procurement	8.1	8.2	8.3	8.4	8.5	8.6	8.8	8.9	9.0	9.1
Other*	39.5	40.1	40.6	41.2	41.8	42.4	43.0	43.6	44.2	44.8
Total	49.4	50.1	50.8	51.5	52.2	53.0	53.7	54.4	55.2	56.0

*includes O&M, construction, personnel, etc.

Domestic Production Forecast

(units)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Aircraft										
A400M Transport	6	6	6	6	5	—	—	—	—	—
NH90	7	7	7	7	7	7	7	—	—	—
Armored Vehicles										
Puma Troop Carrier	35	35	35	—	—	—	—	—	—	—
Boxer Troop Carrier	20	20	—	—	—	—	—	—	—	—
Warships										
Type 125 Frigate	2	—	—	—	—	—	—	—	—	—
Type 130 Corvette	—	—	—	—	2	2	2	—	—	—
Type 180 MPCS	—	—	—	1	1	1	1	—	—	—