

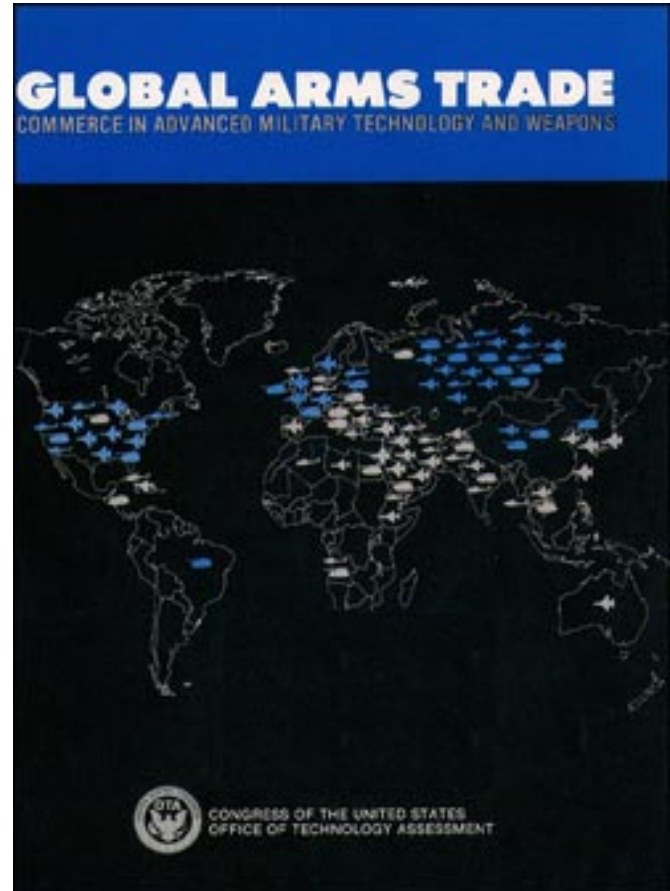
*Global Arms Trade: Commerce in  
Advanced Military Technology and  
Weapons*

June 1991

OTA-ISC-460

NTIS order #PB91-212175

GPO stock #052-003-01244-8



Recommended Citation:

U.S. Congress, Office of Technology Assessment, *Global Arms Trade, OTA-ISC-460*  
(Washington, DC: U.S. Government Printing Office, June 1991).

For sale by the Superintendent of Documents  
U.S. Government Printing Office, Washington, DC 20402-9325  
(order form can be found in the back of this report)

# Foreword

The recent war in the Persian Gulf has once again focused attention on the proliferation of advanced weapons and the international arms industry. Although Iraq had little or no defense industrial capability, it was able to obtain a vast arsenal of modern weapons from the Soviet Union, Western Europe, China, Eastern Europe, and a variety of arms producers in the developing world.

Today, the international arms market is a buyers' market in which modern tanks, fighter aircraft, submarines, missiles, and other weapons are available to any nation that can afford them. Increasingly, sales of major weapons also include the transfer of the underlying technologies necessary for local production, resulting in widespread proliferation of modern weapons and the means to produce--and even develop--them.

The end of the Cold War has brought profoundly decreased demand for weapons by the United States, the Soviet Union, and most European governments. In the United States, and elsewhere, some defense companies are seeking to increase their international sales as part of a strategy to adjust to the new realities of lower procurement budgets and less domestic demand for their products. But because of worldwide overcapacity in defense production, competition is fierce and sales arrangements are complex, increasingly bypassing government-to-government agreements.

Congress faces two very important and interconnected issues: 1) controlling the proliferation of modern weapons and defense technology and 2) the health of the U.S. defense industries. This report, the final product of OTA's assessment on international collaboration in defense technology, explores the form and dynamics of the international defense industry, the intricacies of technology transfer and equipment sales, and the implications for U.S. policy. An interim report, *Arming Our Allies: Cooperation and Competition in Defense Technology*, was published in May 1990.

This assessment was requested by the Senate Committee on Armed Services and the House Committee on Government Operations. OTA particularly wishes to acknowledge the assistance of the Foreign Affairs and National Defense division of the Congressional Research Service in preparing part of this report.



**JOHN H. GIBBONS**  
*Director*

# International Collaboration in Defense Technology Advisory Panel

John S. Toll, *Chair*  
President, Universities Research Association, Inc.

David M. Abshire  
Chancellor  
Center for Strategic and International Studies

Morton Bahr  
President  
Communications Workers of America

Michael Bonsignore  
President  
Honeywell International

Robert B. Costello  
Senior Fellow  
Hudson Institute

Jacques S. Gansler  
Senior Vice President  
The Analytic Sciences Corp.

Everett D. Greinke  
Consultant

Ryusuke Hasegawa  
Director of Far East Affairs  
Allied Signal Corp.

Robert J. Herman  
Vice President  
United Technologies Corp.

Robert D. Hormats  
Vice Chairman  
Goldman Sachs International

Francine Lamoriello  
Manager of International Trade  
KPMG Peat Marwick Co.

Robert G. Lunn  
Lt. General, USA (retired)  
Vice President  
Science Applications International Corp.

Andrew J. Pierre  
Senior Associate  
Carnegie Endowment for International Peace

Raymond C. Preston  
Brig. General, USAF (retired)  
Vice President Washington Operations  
Williams International

Clyde V. Prestowitz  
President  
Economic Strategy Institute

John D. Rittenhouse  
Senior Vice President  
GE Aerospace

Richard Samuels  
Professor  
Department of Political Science  
Massachusetts Institute of Technology

James A. Tegnalia  
Vice President  
Martin Marietta Electronics

Richard E. Tierney  
President, Grand Rapids Division  
Smiths Industries Aerospace &  
Defense Systems, Inc.

Raymond Vernon  
Professor  
J.F. Kennedy School of Government  
Harvard University

Dale S. Warren  
Vice President & Deputy General Manager  
Douglas Aircraft Co.

NOTE: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the advisory panel members. The panel does not, however, necessarily approve, disapprove, or endorse this **report**. OTA assumes full responsibility for the **report** and the accuracy of its contents.

# **OTA Project Staff—International Collaboration in Defense Technology**

Lionel S. Johns, *Assistant Director, OTA  
Energy, Materials, and International Security Division*

Alan Shaw, *International Security and Commerce Program Manager*

William W. Keller, *Project Director*

Todd M. La Porte

## ***Administrative Staff***

Jackie Boykin

Louise Staley

Madeline Gross

## **Congressional Research Service Contributor**

Larry A. Niksch

## **Contractors**

P. Robert Calaway

Michael W. Chinworth

Carol V. Evans

Allen Greenberg

Ethan B. Kapstein

Arnold S. Levine

Ariel Levite

Peter H. Rose

# Workshop on Arms Transfers to the Middle East

William W. Keller, *Chair*  
International Security and Commerce Program  
Office of Technology Assessment

Seth Carus  
Washington Institute on Near East Policy

William Clemens  
Bureau of Export Administration  
U.S. Department of Commerce

Howard M. Fish  
LTV Aerospace & Defense Co.

Richard Grimett  
Congressional Research Service

Col. James Hutchison  
International Development and Production  
Programs  
U.S. Department of Defense

Michael Klare  
Hampshire College

David Louscher  
Foresight International, and University of Akron

Morton S. Miller  
Consultant

Robert Pace  
Bureau of Politico-Military Affairs  
U.S. Department of State

Andrew J. Pierre  
Carnegie Endowment for International Peace

Ralph Sanders  
Industrial College of the Armed Forces  
National Defense University

John T. Tyler  
Defense Security Assistance Agency

NOTE: OTA appreciates and is **grateful** for the valuable assistance and thoughtful critiques provided by the participants in the workshop. The workshop participants do not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report **and** the accuracy of its contents.

## Acknowledgments

OTA gratefully acknowledges the assistance of individuals in the following organizations for their help in supplying information or in reviewing drafts of this report. The organizations listed do not necessarily approve, disapprove, or endorse this report; OTA assumes full responsibility for the report and the accuracy of its contents.

Aeritalia-Societa Aerospaziale Italiana p.A.	McDonnell Douglas Corp.
Aeromaritime Systembau GmbH	Messerschmitt-Bolkow-Blohm GmbH
Agency for Defense Development, South Korea	Ministry of Defence, United Kingdom
Agusta Aerospace Co.	Ministry of Defense, General Armaments Directorate, France
AMP Corp.	Ministry of Defense, Germany
Association of High Technology Industries for Defense, Italy	Ministry of Defense, Italy
Associazione Nazionale Industrie Elettrotecniche Ed Elettroniche	Ministry of Foreign Affairs, Japan
Avions Marcel Dassault-Breguet Aviation	Ministry of Industry, Italy
Bechtel National, Inc.	Ministry of International Trade and Industry, Japan
Betzelt GmbH	Ministry of National Defense, South Korea
Boeing Corp.	Mitsubishi Heavy Industries
British Aerospace PLC	National Defense Academy, Japan
British Embassy, Washington	National Defense University
Brookings Institution	NATO European Fighter Aircraft Management Agency
Brush Welman Corp.	<b>NBC Corp.</b>
C. Itoh & Co.	<b>North</b> Atlantic Treaty Organization
Daewoo Corp.	Northrop Corp.
Deutsche Aerospace AG	Office of the Assistant Secretary of Defense for International Security Affairs
Dowty Electronic Systems, Inc.	Office of the Assistant Secretary of Defense for International Security Policy
Dowty Electronics, Ltd.	Office of the Assistant Secretary of Defense for Legislative Affairs
Elettronica S.p.A.	Office of the Deputy Under Secretary of Defense for International Programs
Fabbrica Italiana Apparecchiature Radioelettriche S.p.A.	Office of the Secretary of Defense
Fiat, Washington, Inc.	Panavia Aircraft GmbH
Fokker Aircraft USA, Inc.	Parliamentary Committee for Technological Innovation, Italy
French Embassy, Washington	Republic of Korea Embassy, Washington
General Dynamics Corp.	Rockwell International Corp.
General Electric Aerospace	Rolls Royce
General Electric Engines	S.G. Warburg Securities Inc., Japan
German Embassy, Washington	Samsung Aerospace Industries
Harvard University, Center for International Affairs	Selenia Spazio S.p.A.
Hollandse Signaalapparaten B.V.	Selenia-Industrie Elettroniche Associate S.p.A.
Hughes Aerospace	Siemens AG
Hyundai Precision Industries	Society of Japanese Aerospace Companies
Industrieanlage Betriebsgesellschaft (IABG)	Sumitomo Corp.
International Institute for Global Peace, Japan	Thomson-CSF
Italian Embassy, Washington	Toshiba Corp.
Japan Defense Agency	TRW Overseas, Inc.
Japan Institute of International Affairs	U.S. Air Force, Office of Legislative Liaison
Japanese Embassy, Washington	U.S. Arms Control and Disarmament Agency
Joint U.S. Military Assistance Group, Republic of Korea	U.S. Army, Office of the Chief of Legislative Liaison
Keidanren	U.S. Defense Advanced Research Projects Agency
Korean Defense Industry Association	U.S. Defense Attache Office, United Kingdom
Larep s.r.l.	U.S. Defense Security Assistance Agency
Logistics Management Institute	U.S. Defense Technology Security Administration
Lucas Aerospace, Ltd.	U.S. Department of Commerce, Bureau of Export Administration
Martin Marietta Corp.	
Massachusetts Institute of Technology	
Matra Aerospace, Inc.	
Matra Defense S.A.	
MBB of America, Inc.	

U.S. Department of State, Bureau of Politico-Military  
Affairs  
U.S. Department of State, Office of the Under Secretary  
for International Security Affairs  
U.S. Department of the Air Force  
U.S. Department of the Army  
U.S. Department of the Navy  
U.S. Embassy, Belgium  
U.S. Embassy, France  
U.S. Embassy, Germany  
U.S. Embassy, Italy

U.S. Embassy, Japan  
U.S. Embassy, United Kingdom  
U.S. General Accounting Office  
U.S. Mutual Defense Assistance Office, Tokyo  
U.S. Navy, Office of Legislative Affairs  
U.S. Office of Defense Cooperation, Bonn  
U.S. Office of Defense Cooperation, Brussels  
U.S. Office of Defense Cooperation, Paris  
U.S. Office of Defense Cooperation, Rome  
United Technologies Corp.  
Westinghouse Corp.