

ARCHIVED REPORT

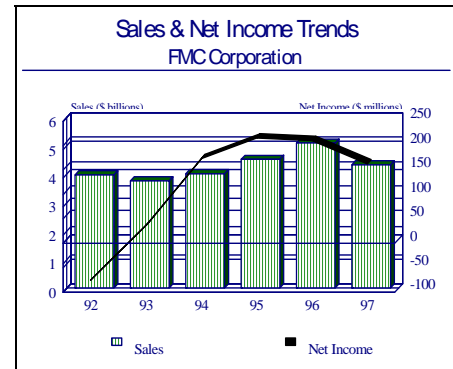
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FMC Corporation - Archived 5/99

Outlook

- United Defense L.P. was sold to the Carlyle Group in October 1997 for \$850 million
- Under Carlyle, United Defense will function pretty much independently, retaining its management and structure
- United Defense is looking to enhance markets overseas in order to make up for slow growth opportunities at home



Headquarters

FMC Corporation
200 East Randolph Drive
Chicago, IL 60601
Telephone: (312) 861-6000
Web Site: <http://www.fmc.com>

FMC was incorporated in Delaware in 1928. As one of the world's leading producers of chemicals and machinery for industry, agriculture and government, FMC participates on a global basis in selected segments of five broad markets: Industrial Chemicals, Performance Chemicals, Precious Metals, Defense Systems, and Machinery and Equipment. FMC operates 99 manufacturing facilities and mines in 18

countries. FMC has major research facilities in Santa Clara, CA; Princeton, NJ; and Minneapolis, MN.

In 1993, FMC's Defense Systems business combined with Harsco's BMY Combat Systems to form the jointly owned United Defense L.P. FMC managed the operation with a 60-percent interest. This operation was subsequently sold to the Carlyle Group in October 1997 for \$850 million.

At the beginning of 1997, FMC employed 22,000 people. Its stock is traded on the New York, Midwest and Pacific exchanges under the symbol "FMC." KPMG Peat Marwick is the independent auditor for the company.

Structure and Personnel

Robert N. Burt
Chairman of the Board and Chief Executive Officer

Larry D. Brady
President

Product Area

FMC is engaged in and manages business in five major product and market areas: Industrial Chemicals, Performance Chemicals, Precious Metals, Defense Systems, and Machinery and Equipment. The corporate structure is outlined below.

1. Performance Chemicals Group
 - 1.1 Agricultural Products Division
 - 1.2 Specialty Chemicals Division

- 1.2.1 Pharmaceutical Division
- 1.2.2 Lithium Division
- 1.2.3 BioProducts Business
- 1.2.4 Process Additives Division
- 1.2.5 Food Ingredients
2. Industrial Chemicals Group
 - 2.1 Alkali Chemicals Division
 - 2.2 FMC Foret SA

- 2.3 Active Oxidants Division
- 2.4 Phosphorus Chemicals Division
- 2.5 Hydrogen Peroxide Division
- 3. Machinery and Equipment Group
 - 3.1 Energy and Transportation Equipment
 - 3.2 Food Machinery
- 4. Defense Systems
 - 4.1 United Defense L.P. (*sold October 1997*)
 - 4.1.1 Ground Systems Division
 - 4.1.2 Armament Systems Division
 - 4.1.3 International Division
 - 4.1.4 Steel Products Division

Performance Chemicals. The Specialty Chemicals unit makes pharmaceutical ingredients, food additives, specialty chemicals and biochemical products. Their market is composed of the food, life science and personal care industries.

Industrial Chemicals Products. This unit produces chemical products such as soda ash, caustic soda, sodium phosphates, acids, organic and hydrogen peroxides, sulfates, lithium chlorides, bromides, calcium and zinc

peroxides, and phosphorus chemicals. The group's market is composed of detergent, food, mining, pulp, paper, water treatment, pharmaceutical, electronics and in aerospace and defense producing components, products and systems.

Machinery and Equipment. Energy and Transportation Equipment makes oil and gas well drilling products, airline cargo and baggage handling equipment, aircraft deicers, passenger stairs, tow tractors and transporters for the aerospace industry. They also makes automotive service equipment and material handling equipment and systems. Food Machinery makes agricultural equipment (sprayers, pumps) food processing systems (canning, sealing, etc.) and packaging equipment for industrial applications.

Defense Systems. This group was composed of the jointly owned United Defense L.P. (FMC, 60 percent and Harsco, 40 percent) which was sold to Carlyle in 1997.

Facilities

The majority of the firm's aerospace and defense equipment and systems business is done at the facilities listed below.

Eastern Region

Airline Equipment Division, 7300 Presidents Drive, Box 13400, Orlando, FL 32809. Telephone (407) 851-3377. Manufactures cargo and baggage loaders, aircraft deicers, passenger stairs, tow tractors and transporters.

United Defense L.P., Headquarters, 1525 Wilson Boulevard, Suite 700, Arlington, VA 22209-2411. Telephone (703) 312-6100. Web Site: <http://www.uniteddefense.com>. Develops technology, including hardware and software, and integrates into the manufacture of tracked vehicles for the US Armed Forces and allied governments.

United Defense L.P., Ground Systems Division, 1525 Wilson Boulevard, Suite 700, Arlington, VA 22209-2411. Telephone (703) 312-6100. Develops technology, including hardware and software, and integrates into the manufacture of tracked vehicles for the US Armed Forces and allied governments. Prime contractor for integrating high-tech systems into the Bradley Fighting Vehicle and across other US Army programs.

United Defense L.P., Combat Systems Division, PO Box 15512, York, PA 17405. Telephone (717) 225-8000. Formerly Harsco BMY Combat Systems Division.

Central Region

United Defense L.P., Steel Products Division, 2101 West 10th Street, PO Box 1030, Anniston, AL 36201. Telephone (205) 237-2841. Manufactures military track, vehicle components, commercial castings and forging.

United Defense L.P., Armament Systems Division, 4800 East River Road, Minneapolis, MN 55421. Telephone (612) 571-9201. Manufactures naval gun systems, vertical missile launchers, pointing missile launchers, submarine systems; provides overhaul and repair and product support. This operation was previously called the Naval Systems Division.

The company facility at Aberdeen, South Dakota, is believed to produce loaded VLS canister sets.

Western Region

United Defense L.P., Ground Systems Division, 2830 De La Cruz Blvd, Box 58123, Santa Clara, CA 95052. Telephone (408) 289-2882. This is the headquarters for the former Defense Systems Group of FMC, now United Defense L.P. This group operates within the US as a major supplier of tracked vehicles to the Army and Marine Corp and provides large caliber gun mounts and missile launching systems to the Navy. This division manufactures military vehicles including the M2/M3 Bradley infantry fighting vehicle as well as the LVTP-7 amphibious tracked landing vehicle.

United Defense L.P., International Division, 2830 De La Cruz Blvd, Box 58123, Santa Clara, CA 95052. Telephone (408) 289-0111. Manufactures ground combat

vehicles, naval system components; provides product support and training.

Corporate Overview

New Products and Services

Linebacker. In November 1997, United Defense delivered the first production M6 Bradley Linebackers to the Army. The Linebacker is a Bradley variant tasked with short range air defense. The vehicle has been modified to fire Stinger ground-to-air missiles in place of the usual TOW anti-tank missiles. United Defense will build a total of 85 vehicles through 1998.

Composite Armored Vehicle. In February 1997, United Defense rolled out its Composite Armored Vehicle (CAV) prototype. Begun in 1994, the CAV was developed as part of an Army Advanced Technology Demonstration program to demonstrate that light-weight armored vehicles, made of advanced composites and titanium alloys, can survive on the modern battlefield.

Mk 45 Gun Mount Mods. In February 1996, United Defense received a \$49.6 million contract to modify the Navy's five-inch, 54-caliber Mk 45 gun mount. The modification will extend range capability and enhance overall performance for the Naval Surface Fire Support mission. United Defense will adapt the fleet's current Mk 45 gun to fire an extended range guided munition up to 63 miles.

M1 Breacher Rollout. In January 1995, United Defense rolled out the first of two Breacher prototype armored engineering vehicles. The Breacher, known as the "Grizzly," is designed to clear mines and obstacles and was developed as a result of shortcomings encountered during the Persian Gulf War. The rollout of the Breacher, which has suffered technical problems, comes over nine months after its was originally scheduled to have occurred. The systems now faces an Army program review that will decide the shape of the program. However, in January 1996, its was announced that the fielding of the Breacher vehicle had slipped by one year due to funding cuts. The Army now plans to introduce the Breacher to troops around the beginning of 2002.

Crusader. In mid-1994, the Army released the Request For Proposals for the Advanced Field Artillery System (AFAS) and Future Armored Resupply Vehicle (FARV) program to a team led by United Defense. United Defense has formed an industry team consisting of Lockheed Martin, Teledyne and General Dynamics Land Systems.

Advanced Propulsion System Demonstrator. In June 1994, United Defense L.P. rolled out its Advanced Propulsion System Demonstrator. The APS Demonstrator features

a complete electric drive systems integrated inside the hull of an early prototype of the LVPT7. The 30-ton system is the first vehicle of its size using a modern electric drive system that can meet military performance requirements.

Bradley Sole Source. In February 1994, the Army said it would sole source the upgrade work on the Bradley Fighting Vehicle to United Defense L.P. Currently the company is in the midst of an engineering contract for the Electronic Fighting Vehicle System, a communication system that could result in full-scale production by the mid- to late 1990s. Also in development are the Fire Integration Support Team Vehicle, which will locate targets for other weapon systems, and the Line of Sight Anti-Tank System (LOSAT), a new tank-killing missile system based on the Bradley chassis. LOSAT production could begin in 1998.

Plant Expansion/Organization Update

Manufacturing To Move to York. In June 1994, United Defense L.P. announced plans to switch the bulk of its manufacturing work from San Jose, California, to York, Pennsylvania. According to reports, United Defense plans to save about \$25 million through the moving of the San Jose operations to the York facility. The company is taking advantage of lower labor cost in Pennsylvania by moving work to York. Along with engineering and program management operations, a small amount of manufacturing, routing and welding is expected to remain in San Jose.

Mergers/Acquisitions/Divestitures

United Defense Sold. In October 1997, FMC, Harsco and The Carlyle Group announced that FMC and Harsco have completed the sale of United Defense, L.P. to The Carlyle Group for \$850 million. FMC was the managing general partner and 60 percent owner of United Defense, which was formed in 1994 by combining FMC's Defense Systems Group with Harsco Corporation's BMY Combat Systems Division. Harsco owned the remaining 40 percent. United Defense supplies ground combat and naval weapons systems for the US and military customers around the world. United Defense had 1996 sales of \$1 billion. FMC's 60 percent share of the proceeds is \$510 million – \$460 million in cash and \$50 million in a note payable after finalizing international joint-venture agreements. FMC expects the note to be paid in 1998. After-tax proceeds should be

approximately \$375 million. Carlyle has retained United Defense's management team and it will continue to be headed by president and CEO Tom Rabaut.

United Defense L.P. is headquartered in Arlington, Virginia. The company employs more than 6,000 people and operates major engineering, manufacturing and services sites in Santa Clara and San Jose, California; Fridley, Minnesota; Anniston, Alaska; Aiken, South Carolina; Aberdeen, South Dakota; and York, Chambersburg and Fayette County, Pennsylvania.

Caterpillar Division Acquired. In September 1994, FMC completed its acquisition of the Automated Vehicle Systems group of Caterpillar Industrial Corp, which produces automated guided vehicles to the military. AVS is becoming a unit of FMC's Energy and Transportation Equipment Group's Material Handling Systems Division. Terms of the deal were not announced.

Jetway Systems Acquired. In May 1994, FMC announced plans to buy Abex's Jetway Systems for \$40 million in cash. Jetway produces passenger boarding bridges and has helped pioneer integrated gate systems.

Teaming/Competition/Joint Ventures

Lancer Team. In April 1997, United Defense teamed with Texas Instruments and GEC-Marconis and GKN Defence for the Future Scout and Cavalry System (FSCS). The FSCS is a replacement for the US Army's M3 Bradley and British Army's Scorpion family of scout vehicles. The Lancer team is competing against a rival offering from Lockheed Martin and its partners, British Aerospace, General Dynamics Land Systems, and Vickers plc. The development program will begin in 1998 with an Advanced Technology Demonstration. This phase will be followed by engineering and manufacturing development in 2002 through 2006. Tentative requirements are 1,700 vehicles for the US Army and 400 vehicles for Britain. The program is estimated to cost over \$3 billion.

Vickers. In October 1995, United Defense and Vickers Defence Systems signed a teaming agreement to offer Vickers' BR90 bridging system to the US Army. United Defense will offer the BR90 for the US Army's Heavy

Dry Support Bridge requirement. Under the arrangement, United Defense will be responsible for overall program management, launcher manufacture and integration of the launcher with the Palletized Loading System. Vickers will supply the modular, aluminum alloy bridge structure.

Rheinmetall. In June 1994, United Defense and Rheinmetall of Germany announced that they were teaming to market the Armored Gun System to European allies.

Hwa Fong. In 1994, the Taiwan-based Hwa Fong and United Defense teamed up to provide the Armored Gun System to Taiwan.

FMC-Arabia. FMC-Arabia is a joint venture of United Defense L.P. and Al-Hejailan Projects Engineering Co in Riyadh, Saudi Arabia. The business provides services for logistics support and maintenance of Saudi Arabia's fleet of Bradley fighting vehicles.

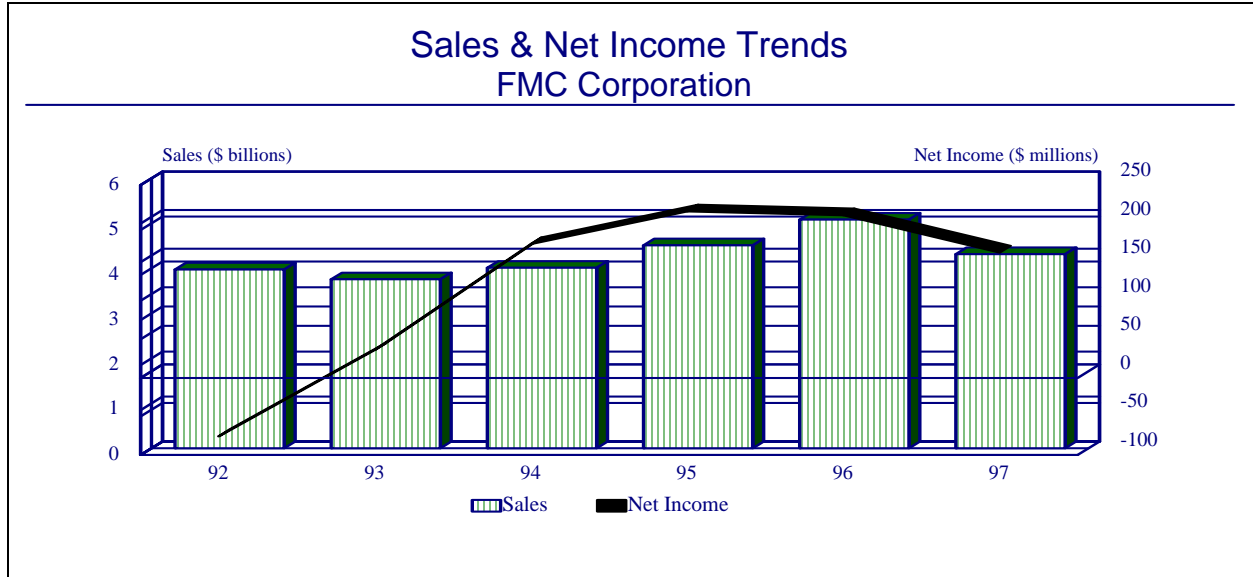
Team AFAS. United Defense is leading the team that is pursuing the Dem/Val phase of the US Army's Advanced Field Artillery System (AFAS), now known as Crusader, and Future Armored Resupply Vehicle (FARV) program. Other team members include General Dynamics Land Systems Division, Lockheed Martin (formerly Martin Marietta Defense Systems), and Teledyne Continental Motors. The integrated industry team will be headquartered at the Armament Systems Division of United Defense in Minneapolis, Minnesota. The four former rival firms agreed on a team structure that capitalizes on the distinctive skills of each and potentially reduces program cost and risk.

FNSS. This is a joint venture between United Defense and the Turkish firm Nurol to produce armored combat vehicles for the Turkish Army. In September 1997, United Defense requested information on bidding on Turkey's new Main Battle Tank program. It is assumed that any win will be co-produced by this joint venture.

Financial Results/Corporate Statistics

Sales in 1997 were \$4.3 billion compared to \$5.1 billion posted in 1996. Income dropped to \$162.47 million, compared with \$210.7 million in 1996, primarily due to the listing of United Defense as a discontinued operation. The lower income in 1993 includes a pretax restructuring and other charges of \$172.3 million. In addition, an after-tax charge of \$4.7 million was recorded in 1993 for additional debt restructuring. After-tax special charges recorded in 1992 include \$183.7 million resulting from the adoption of SFAS No. 106, \$73.2 million related to previously discontinued operations for environmental and product liability requirements, and \$11.4 million related to restructuring and debt. After special charges, the net loss for 1992 was \$75.7 million. Latest financial statistics are listed below. Backlog figures are for the Defense Systems segment only. Percent Government figures are estimated.

Y/E December 31	1992	1993	1994	1995	1996	1997
(\$ millions)						
Net Sales	3973.7	3753.9	4010.8	4509.8	5080.6	4312.6
Percent Govt.	16.0	16.0	15.0	16.0	17.0	-
Net Income	-75.7	36.3	173.4	215.6	210.7	162.4
Backlog	1342.6	1105.0	1412.3	1495.0	1600.0	-

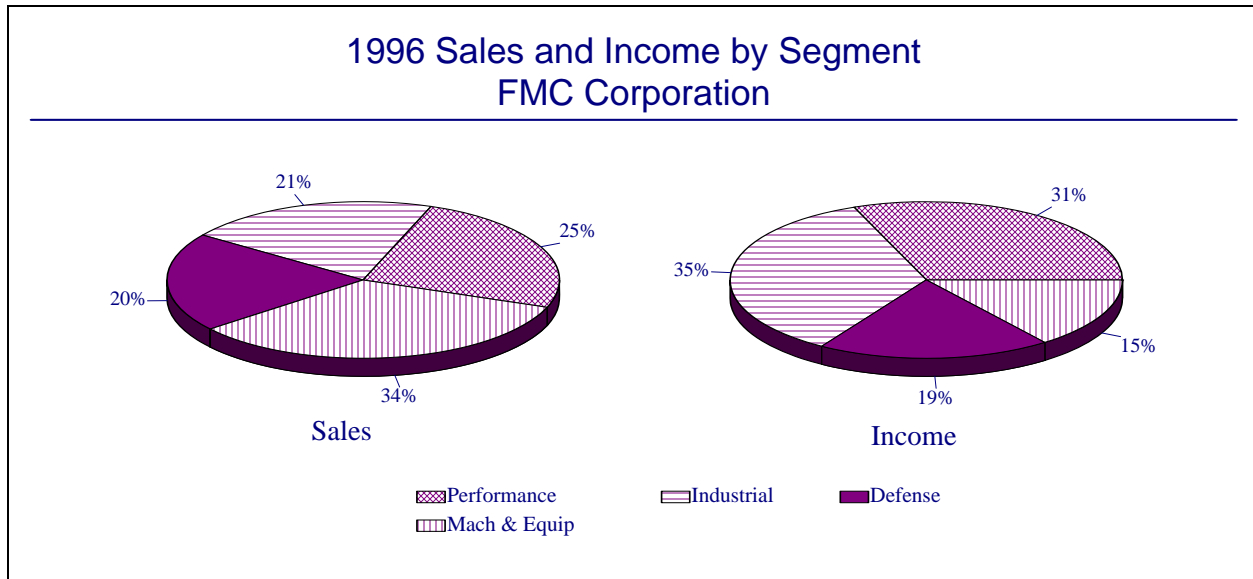


Industry Segments

A breakdown of the firm's sales and operating income by business segment is given below, with dollars in millions. In 1996 FMC listed its Precious Metals segment as a discontinued operation. In 1997 FMC listed its Defense Systems segment as a discontinued operation. Full results were unavailable as of press time.

SALES	1993	1994	1995	1996
(\$ millions)				
Industrial Chem.	979.5	866.8	976.9	1041.3
Performance Chem.	857.9	1060.5	1176.5	1251.8
Precious Metals	125	60.9	59.0	-
Defense Systems	950.2	1080.5	968.2	1018.8
Mach. & Equip.	870.9	972.7	1350.9	1684.9
Adjustments	-29.6	-30.6	-21.7	-27.4
TOTAL	3753.9	4010.8	4509.8	4969.4

OPERATING INCOME	1993	1994	1995	1996
(\$ millions)				
Industrial Chem.	64.3	119.3	161.9	181.8
Performance Chem.	132.9	154.0	161.6	159.2
Precious Metals	9.7	-9.0	-5.7	-
Defense Systems	161.7	159.5	160.8	98.7
Mach. & Equip.	6.7	33.3	49.8	75.9
Adjustments	-347.7	0	0	0
TOTAL	37.8	457.1	528.4	515.6



1997 Financial Reports

Unaudited quarterly results for the past two years are as follows. 1996 results have not been restated to conform to FMC's current financial presentation.

1997 Quarters	1	2	3	4
(\$ millions)				
Net Sales	1297.7	1478.1	1074.7	1082.6
Net Income	39.9	72.8	62.9	-13.2
1996 Quarters	1	2	3	4
(\$ millions)				
Net Sales	1112.1	1250.7	1278.1	1407.6
Net Income	55.2	56.3	54.6	44.6

Strategic Outlook

After only three years as a joint venture, United Defense L.P. was sold to the Carlyle Group, a Washington-based investment partnership, in late 1997. The Carlyle bid of \$850 million was reportedly lower than a competing General Dynamics offer, but antitrust concerns apparently prompted FMC Corp and Harsco Corp, United Defense's parent companies, to accept the lower bid and avoid unnecessary legal entanglements.

General Dynamics had reportedly offered about \$1 billion for the vehicle maker and was thought to have the inside track. But the GD bid raised major antitrust concerns among federal regulators. The Virginia-based company had a long-standing plan to extend its tank-making monopoly to other battlefield vehicles. But that is what ultimately derailed the deal.

Government officials were not comfortable with having a single supplier of all such vehicles for the US armed

forces, and the Pennsylvania congressional delegation feared that a successful General Dynamics bid would end up transferring production work from United Defense's York facility to GD operations in Michigan or Ohio. The legislators pressured the Justice Department with warnings that such a sale would violate antitrust laws.

Political heat also came from Sen. Orrin Hatch, chairman of the Senate Judiciary Committee, who expressed serious concerns about a potential sale. The Utah Republican urged other members of the Senate panel to provide "heightened scrutiny" of such a transaction because it threatened to reduce competition among makers of heavy combat vehicles. Although General Dynamics tried to ease such concerns by arguing that a major consolidation of production facilities would provide long-term savings for the Pentagon, the political opposition to moving jobs and

antitrust hurdles facing General Dynamics became insurmountable.

With the shedding of United Defense, FMC leaves the defense business it has been in since World War II. However, under Carlyle, United Defense will function pretty much independently retaining its management and structure. As the armored vehicle maker looks to the future, it does still have some options to insure future growth in a somewhat stagnant market. First is the company's focus on systems integration rather than manufacturing. With new production contracts nonexistent, vehicle modification and upgrades have

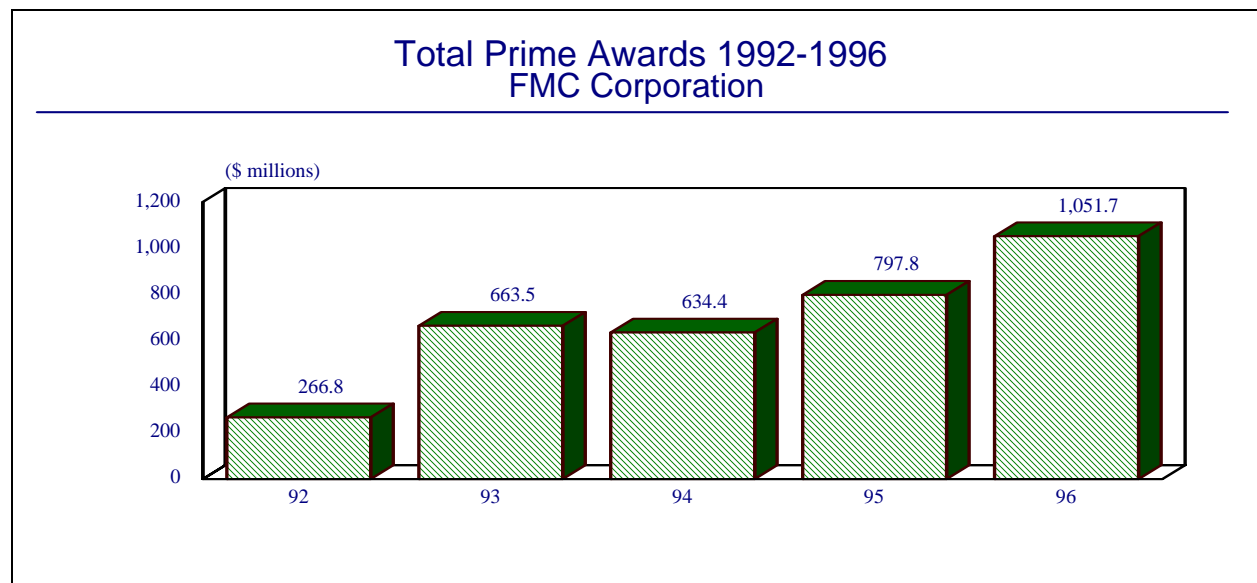
become paramount. United Defense's decision to concentrate on systems integration is a logical move aimed at capturing a large percentage of this modernization and retrofit market.

On the international front, United Defense is looking to enhance markets overseas. These foreign markets include Taiwan, Korea, Greece, Turkey, Thailand, Belgium, the United Kingdom, and Saudi Arabia. International markets account for 25 to 35 percent of United Defense's revenues and, due to the company's strong product line, this is expected to remain steady over the next few years.

Prime Award Summary

The following prime award tables show data for the past five fiscal years for which data are available. Dollars are in millions. Zeroes represent contracts less than \$50,000, and dashes stand for unavailable information.

(\$ millions)	1992	1993	1994	1995	1996
AIR FORCE	2.0	0.0	0.9	3.0	2.4
ARMY	82.2	423.3	538.4	635.2	937.9
CORPS OF ENGINEERS	0.4	0.0	0.0	0.0	0.0
DARPA	2.1	0.0	0.0	0.0	0.0
DEFENSE AGENCIES	0.0	0.0	1.7	0.0	0.0
DEF LOGISTICS AGENCY	0.1	0.0	0.0	0.3	0.4
DEPT. OF TRANSPORTATION	0.0	0.0	0.1	0.3	0.0
NAVY	180.0	240.2	93.3	159.0	111.0
TOTAL	266.8	663.5	634.4	797.8	1051.7



The five-year summary of awards by key location within major geographical area and by customer, with dollars in millions, is reported below.

EASTERN REGION

York, PA	1992	1993	1994	1995	1996
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(\$ millions)

ARMY	-	-	15.7	129.5	324.7
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CENTRAL REGION

Anniston, AL	1992	1993	1994	1995	1996
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(\$ millions)

ARMY	0.6	1.5	0.5	8.8	16.4
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NAVY	0.0	0.0	0.0	21.6	0.4
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TOTAL	0.6	1.5	0.5	30.4	16.8
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Minneapolis, MN	1992	1993	1994	1995	1996
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(\$ millions)

ARMY	19.7	46.9	27.6	113.7	194.9
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DEFENSE AGENCIES	0.0	0.0	1.6	0.0	0.0
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DEF LOGISTICS AGENCY	0.0	0.0	0.1	0.1	0.1
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NAVY	115.1	203.5	85.9	137.0	86.5
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TOTAL	134.8	250.4	115.2	250.8	281.5
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WESTERN REGION

Santa Clara, CA	1992	1993	1994	1995	1996
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(\$ millions)

ARMY	31.2	197.8	285.4	214.0	226.3
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DARPA	2.1	0.0	0.0	0.0	0.0
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NAVY	1.2	0.0	0.0	0.0	0.0
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TOTAL	34.5	197.8	285.4	214.0	226.3
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San Jose, CA	1992	1993	1994	1995	1996
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(\$ millions)

ARMY	30.6	142.4	111.4	40.4	19.3
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DEPT. OF ENERGY	0.0	0.0	0.0	0.0	0.0
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NAVY	0.4	22.2	4.8	0.0	1.2
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TOTAL	31.0	164.6	116.2	40.4	20.5
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Program Activity

Some important aerospace and government programs currently under way at FMC Corporation are listed below. The briefs are intended to provide a listing of programs that are of major importance to the company. For detailed information or analysis of specific aerospace and defense programs or equipment, please refer to the appropriate FORECAST INTERNATIONAL binder (for example AIRCRAFT, MILITARY VEHICLES, WARSHIPS, MISSILES, ELECTRONICS, and GAS TURBINES). The following is an outline of the company's business interests:

- Military Vehicles
- Missiles
- Ordnance Systems
- Systems Integration
- Unmanned Vehicles

The programs listed below are now managed by the newly formed **United Defense L.P.** For the present, the

premerger names – FMC and BMY – have been used when identifying contractors for a program.

Military Vehicle Programs

M1 Breacher

Following the demise of the Counter Obstacle Vehicle program, the US Army still has a requirement for a Combat Mobility Vehicle as part of its Heavy Forces Modernization. The CMV – now designated the M1 Breacher – will be based on an M1 Abrams chassis and will be fitted with various systems to meet specific user requirements on the battlefield. Systems will include an excavating arm, a dozer blade and a mine clearance system. There were three contenders for the CMV program: BMY Combat Systems; General Dynamics, Land Systems Division; and General Motors, Military Vehicle Operations. BMY was finally selected in April 1991. The Breacher is expected to be fielded by the early 21st century. In 1995, United Defense delivered the first of

two Breacher, now known as the "Grizzly," prototypes to government for testing and evaluation.

M992 Field Artillery Supply Vehicle (FAASV)

FAASVs are needed to support HIP M109A6 artillery units. They ferry ammunition, personnel and supplies up to the fire units. The US Army has reaffirmed the need for one FAASV for each HIP, establishing a market for some 300 additional FAASVs. However, the need to cut the budget will probably diminish the urgency of this requirement and result in upgrades of existing vehicles rather than new production. Production of the M992 went dormant in 1994. At present, overseas sales will account for the only production of the M992 that is expected.

M9 Armored Combat Earthmover (ACE)

This equipment is designed for front-line operation and is used in conjunction with tank warfare. Armored and mechanized units are highly vulnerable when holding a line unless they are properly "dug in." ACE is the specialized equipment needed to accomplish this type of mission. It is an earthmoving vehicle used by combat engineers in support of armored battalions. A total of 539 M9 Armored Combat Earthmovers have been produced as of January 1996, mostly for the US Army. The United States Marine Corps has decided to procure the M9 ACE to meet its Combat Excavator requirement. A total of 91 vehicles were planned; this total was subsequently reduced to 87.

M88A1 Recovery Vehicle

The M88A1 is an armored recovery vehicle that performs hoisting, winching, towing and limited bulldozing in the recovery and maintenance of tanks. In early 1991, the M88A1 program was reborn, as orders for the recovery vehicle started to materialize from overseas customers. Due in part to Operation Desert Storm and the cascading effects of the Conventional Forces in Europe treaty, a resurgence of interest has taken place in this system. So far, orders have been placed by Saudi Arabia (12) and Egypt (40) with future orders possible from Greece, Norway, Portugal, Spain and Turkey, as these countries accepted retired M48 and M60 tanks – tanks the M88A1 was designed to recover – into their inventories. An additional 40 to 50 vehicle orders are anticipated from some of these foreign customers. In January of 1991, at the request of the United States Army Tank and Automotive Command, the then BMY Combat Systems submitted a Phase I M88 Improved Recovery Vehicle based on the canceled M88A1E1. The first phase of the United States Army's Improved Recovery vehicle program covers the tear-down and inspection of the existing M88A1E1 prototypes and some limited engineering to further improve selected areas of the design. Phase II will complete the overhaul and upgrade of prototypes, conduct the required testing and complete the technical data package. The main goal of the M88 Improved Recovery

Vehicle program is to produce a recovery vehicle that can safely handle the M1A1/A2. This vehicle has been selected as the United States Army's Improved Recovery Vehicle and will be type classified as the M88A2. Production of this new system began in January 1996.

AAV-7/LVTP-7

The AAV-7/LVTP-7 is a tracked, amphibious armored vehicle developed and manufactured by United Defense L.P. Although the serial production of the AAV-7 ended in 1988, the line remains available for new orders. In late April of 1995, Brazil placed an order for 14 new AAV-7 vehicles. The manufacture of the 14 vehicles at United Defense's Anniston, Alabama, facility are ongoing. The AAV7/LVTP-7 is in service with the United States Marine Corps as well as a number of other nations. A number of modernization and retrofit programs are in various stages of development and/or implementation for this vehicle.

Advanced Amphibious Assault Vehicle

This is a future tracked, amphibious armored vehicle. Prior to a program review, the development program for the Advanced Amphibious Assault Vehicle had the then FMC Corporation and the team of General Dynamics/AAI Corporation competing in the project concept phase. Subsequently, in late 1993, AAI terminated its relationship with General Dynamics and associated itself with United Defense L.P. Once the project concept phase is completed, two contracts were expected to be issued for the demonstration and validation phase; each contractor will fabricate one prototype for competitive testing and evaluation. The winning contractor will be awarded a contract for the full-scale engineering development of its design. During this phase, 15 additional prototypes will be fabricated and tested. Serial production of the Advanced Amphibious Assault Vehicle was originally expected to commence in 2001. The total production run for the United States Marine Corps was originally planned to be around 1,300 vehicles, essentially replacing the AAV7 on a one-for-one basis. However, the reduced defense budgets plus the changing threat have stretched the planned schedule and have reduced the procurement objective to a maximum of 700 vehicles.

Armored Infantry Fighting Vehicle

The configuration of the Armored Infantry Fighting Vehicle followed the improvements to the basic M113, but it includes an Oerlikon-Contraves 25 millimeter model KBA cannon in a new turret and a redesigned commander's cupola with a 7.62 millimeter MAG 58 machine gun. Protection has also been enhanced over the basic M113, as the Armored Infantry Fighting Vehicle has spaced laminate steel armor bolted over the base aluminum armor. In January 1988, the government of Turkey selected the Armored Infantry Fighting Vehicle as

its new infantry fighting vehicle over the British GKN Defence FV510 Warrior and the German Krauss-Maffei Puma. Local assembly, then production of the Armored Infantry Fighting Vehicle is being carried out by FMC's Turkish partner, NUROL Defense Industries of Turkey; FMC owns 51 percent of NUROL.

M2/M3 Bradley

United Defense's largest military program is production of the Bradley Fighting Vehicle. In early 1990, the United States Army slashed its planned procurement of the M2/M3 Bradley by more than 2,000 units, and, in a move designed to ease the cut's impact on the manufacturer, stretched the production run of the remaining units. The agreement allowed the then FMC Corporation to continue production into 1994, and avoid the high cost associated with terminating a weapon contract, Army officials said. The Army had originally intended to procure 8,811 vehicles to meet its requirements. But, due to sharp reductions in its 1992-1997 spending plan and a restructuring of the equipment given to scout units, the Army decided that 6,724 units would be required. During this period, about 400 Bradleys were also produced for sale to Saudi Arabia, and 250 chassis carriers were built for the MLRS program. The Army vehicles, as well as those ordered by Saudi Arabia, have been delivered. However, forecast orders for XM4, XM1070, the Line of Sight Anti-Tank vehicle and other versions will keep the Bradley production line warm through the rest of the nineties and into the next century. In addition, the basic chassis will continue to be ordered for other applications such as the platform for the Multiple Launch Rocket System. Finally, the early 1994 winning of the major M2A3/M3A3 modernization/retrofit program, by United Defense, will also keep the firm's involvement with this program ongoing.

M113

Following a continuous run of 32 years, the then FMC Corporation shut down the M113 line in 1992. However, a late 1993 order from Kuwait prompted the re-opening of the line. Subsequently, another export order for the M113 was placed by Thailand; this order will keep the line active into 1997. In addition, development of the vehicle continues. In addition to the production of new vehicles, United Defense Limited Partnership is currently overhauling existing M113 vehicles as well as converting and modifying existing chassis to A2 and A3 configurations, including the Fire Support Combat Vehicle and the Fire Support Team Vehicle, along with the Improved TOW Vehicle, on an as-requested basis.

Vehicle Components, Tracks and Treads (T&Ts)

FMC Steel Products Division, Anniston, AL, makes vehicle tracks and treads. In addition to providing T&Ts for FMC vehicles, they make T158 track shoe assemblies and spares for the M1 Abrams tank.

XM8 Armored Gun System

This is a light tank specially designed for use with the light/airborne forces of the US Army. The Armored Gun System is to replace the obsolescent M551 Sheridan light tank/reconnaissance vehicle, approximately 57 of which remain in service in the US Army. FMC Corporation/ Ground Systems Division has developed the Close Combat Vehicle-Light and will manufacture this vehicle in a slightly modified form as the Armored Gun System. Major subcontractors include Cadillac Gage Textron, Computing Devices Corporation of Canada, Detroit Diesel, General Electric, Hughes Aircraft and Watervliet Arsenal. In 1993, the Republic of China began to take an interest in the Armored Gun System. By mid-1994, this interest had turned into an official request for up to 700 vehicles. The Hwa Fong firm has teamed with United Defense for the program which may well involve the licensed assembly or manufacture of the vehicle or components in the Republic of China. However, in January 1996 the US procurement program was canceled.

Missile Programs

FMC's Fire and Weapon Control business comprises naval gun systems and shipboard missile launchers. Canister work is usually performed in Aberdeen, MD, and VLS work at Minneapolis, MN.

Vertical Launch Systems

The MK-41 VLS is being installed on newer AEGIS cruisers and destroyers and selected Spruance class ships. The MK-41 is modular in design and its configuration depends on the number and placement of 8-cell launchers. The system can handle a mix of standard, Tomahawk and ASROC missiles. As such it can address air, surface and subsurface threats. FMC is working to integrate Standard Missile Block IV and Sea Lance missiles within the VLS. The company is also part of an international team integrating the vertically launched NATO SeaSparrow into the VLS capabilities.

MK-10s, -13s, -22s, and -26s VLS Canisters

FMC Tartar and Terrier systems are the most widely used shipboard guided missile launchers in the Navy fleet and throughout the Western world. The company is addressing advanced launcher capabilities such as Rolling Airframe Missiles and multi-pack configurations. These upgrades eliminate obsolescence and provide for continuing orders and revenues.

Ordnance Programs

Crusader

This is a tracked 155 millimeter self-propelled artillery system. The development of the Crusader (formerly called the Advanced Field Artillery System) is being sponsored by the United States Department of Defense through the

United States Army. United Defense L.P. is the designated prime contractor for this enhanced self-propelled artillery system. United Defense is leading a team that consists of General Dynamics Land Systems Division, Martin Marietta Defense Systems, Perkins Engines Limited and Teledyne Continental Motors. Two major design criteria are to be incorporated into the design of the Advanced Field Artillery System. Above all, the United States Army wants to reduce the personnel to weapon system ratio, a significant reduction of the five and six man crews of the M109 and other similar systems. The other criteria are a quantum leap in the overall survivability (crew/system) when compared to the M109A6 and similar systems. Of course, a greatly increased range capability and rate of fire is also desired.

Advanced Field Artillery System (AFAS)

In 1991 FMC's Ground Systems Division was the sole source recipient of a \$67 million US Army contract for developmental work on the Advanced Field Artillery System. Utilizing its experience in gun systems, FMC's Naval Systems business conducts much of the engineering work on the project. According to corporate literature, initial development work on the AFAS, a self-propelled howitzer with long-range firepower, could lead to as much as \$4 billion in production contracts at the turn of the century.

MK-45 Gun System

FMC has provided gun systems for most of the Western world navies. The company started producing ordnance equipment in 1938. The MK-45 is a remotely controlled system having two major elements, the above deck gun and turret and the below deck ammunition handling equipment. It is a 5-inch, 54-caliber automatic gun, with the Mod 0 system entering service in 1973 and the Mod 1 currently in production.

Howitzer Improvement Program (HIP) M109A6

The HIP (for the 155-millimeter self-propelled Army howitzers) program follows a HELP (Howitzer Extended Life Program) completed by the Army in the mid- to late 1980s. Both were aimed at extending the life of the M109 into the 21st century. US Army operational testing of the HIP prototypes was successfully concluded in the summer of 1989, and in 1990 the Army type classified the modernized Howitzer to M109A6. This concluded a \$120 million full-scale engineering development program by BMY, and the acceptance could result in upgrades ranging from 200 to 500 units. The HIP systems have been demonstrated to over 12 different countries at the Yuma Proving Grounds, and international sales for upgrading of foreign-owned units may well parallel US Army orders. For US Army orders, BMY would be responsible for fabricating and integrating all new turrets on upgraded

M109 chassis supplied by the Army. International sales might include more content.

M109A2/A5 Self Propelled Howitzer

This standard unit is the mainstay of many friendly (and unfriendly) armed forces. BMY was negotiating a 1990 order for an international customer for 470 units and potential sales for \$250 million under a coproduction agreement. These are the units that the US Army is turning into M109A6s in the HIP program. In 1990, an agreement was reached with South Korea for BMY-CSD (Combat Systems Division) to deliver up to 470 howitzer kits to Samsung Shipbuilding and Heavy Industries of Korea. Samsung adds locally manufactured items and assembles the howitzers for the Korean government. The Korean program was believed to have been completed in 1994.

Lightweight Indirect Fire Support Weapon

British Light 155 Requirement

British Light 155 mm Towed Artillery

These programs cover anticipated requirements for new US and UK lightweight 155 millimeter towed artillery systems. Enhanced-design light 155 millimeter artillery systems have been or are in some stage of research and development by United Defense L.P. and AAI Corporation. In addition, Royal Ordnance plc/Guns and Vehicles Division and Vickers Shipbuilding and Engineering are developing weapons of this type. Recently, Royal Ordnance has teamed with United Defense L.P. on the Light Towed Howitzer program to meet the United States' requirement for such a weapon. In the United States, the Lightweight Towed Howitzer program has gone through a rather confusing history, with two separate programs being run at various times by the Marine Corps (which has long been the lead service in demanding a new lightweight 155 millimeter howitzer) and the Army. In 1991, the two services combined their requirements and in December of that year, issued a joint operational requirement. But differing range, weight and other operational requirements forced another review of the program, with a definitive agreement reached in late 1993. In March 1997, however, United Defense L.P. lost out on the joint US Army and Marine contract to a team led by Cadillac Gage and GEC-Marine VSEL.

Unmanned Vehicle Programs

Combat Engineering/Support Vehicles

The United States is researching the possible development of unmanned engineering and support vehicles. These unmanned ground vehicles would perform certain hazardous and/or repetitive missions that human soldiers are presently required to do. The following provides information on some projects being conducted by the US military services that FMC is involved with.

Cargo Handler. The Universal Self Deployable Cargo Handler (USDCH) promises to become another valuable robot combat support device. It is the successor to the Battlefield Robotic Ammunition Supply System (BRASS), which entered development in 1984. The BRASS was to be an autonomous vehicle for handling ammunition under fire on the battlefield. It soon became evident that the computer and artificial intelligence technology then available were not sufficient to complete the project. In mid-1988, however, the technology had evolved sufficiently for the US Army to let a contract to FMC for the design, manufacture and technical integration of the prototype, redesignated USDCH. This robotic vehicle will be an extended reach forklift for work in hazardous environments. Besides operating in ammunition depots, the tasks could include moving dangerous materials and handling radioactive or chemically contaminated objects.

The USDCH also belongs in the remotely controlled category of robots, and will primarily be used as a basic experimental platform which may be fitted with more sophisticated equipment than a forklift.

Advanced Manipulator. FMC simultaneously received a separate contract as project leader for an advanced robotics manipulator. This will be an electrically driven robot with two arms that reproduce human arm, wrist and finger movements, including tactile sensors which let the system handle eggs as well as heavy objects. Cooperating with FMC are Odetics Incorporated, Bonneville Scientific and Stanford University. The USDCH fitted with such a robotic system could offer a universal machine capability, able to do tasks ranging from the removal of a jet engine from an aircraft to recharging the external ammunition magazine of a battle tank under combat conditions.

US Contract Awards

Below is a listing of major contracts awarded to FMC Corporation from the United States government in the past year (contracts as of press date).

<u>Date</u>	<u>Award (\$ millions)</u>	<u>Contract #</u>	<u>Description</u>
1996			
1/19/96	\$59.3	DAAE07-96-C-X036	Remanufacture of 105 cavalry fighting vehicles.
1/31/96	\$40.1	DAAE07-94-C-0429	42 Hercules improved recovery vehicles for Kuwait.
2/5/96	\$46.6	N00024-96-C-5223	Performance modification to the 5-inch/54 Mark 45 gun mount.
4/23/96	\$24.2	DAAE07-96-C-X130	Operation Desert Storm improvement kits for the Bradley.
4/30/96	\$48.5	DAAE07-94-C-0429	24 Hercules improved recovery vehicles and spares.
4/30/96	\$5.4	N00024-96-C-5231	Long lead time materials for the 5-inch/54 Mark 45 gun mount.
5/3/96	\$12.1	N00024-95-C-5328	Engineering support for the Mark 41 Vertical Launch System.
7/3/96	\$38.6	DAAE07-96-C-X175	48 Field Artillery Ammunition Support Vehicles.
7/19/96	\$22.6	N00024-96-C-0543	Privatization of the life-cycle support of the Navy Gun Weapon Systems.
8/2/96	\$6.6	DAAE07-95-C-?X03	System technical support for the Bradley fighting vehicle system.
8/23/96	\$8.9	N00024-95C-5305	Fabrication of canisters for the Mark 41 Vertical Launching System.
11/20/96	\$35.2	N00024-96-C-5432	FY98 life-cycle maintenance support of Navy Gun Weapon Systems.
12/16/96	\$8.8	N00024-95-C-5305	Canisters for the Mark 41 Vertical Launching System.
12/23/96	\$5.9	DAAE07-95-C-X03?	Engineering support for Command & Control LRIP vehicles.
12/23/96	\$12.4	DAAE07-97-C-X032	Five Command & Control carriers.
12/23/96	\$15.3	DAAE07-96-C-X175	24 field artillery ammunition support vehicles.
1997			
1/16/97	\$5.1	DAAE07-95-C-X030	MLRS overhaul program.
3/6/97	\$10.7	DAAE07-93-C-A018	Upgrade of 332 vehicles within the M113 family.

<u>Date</u>	<u>Award (\$ millions)</u>	<u>Contract #</u>	<u>Description</u>
3/26/97	\$16.9	DAAE07-96-C-X175	24 Field Artillery Ammunition Support Vehicles (FAASV).
4/9/97	\$25.4	DAAA21-93-C-0044	37 M109A6 Paladin self-propelled howitzers with FY98 options for 36 to 72 additional units.
4/15/97	\$47.1	DAAE07-94-C-0429	24 Improved Recovery Vehicles M88A2.
4/22/97	\$7.2	N00024-95-C-5328	Engineering services in support of the Mark 41 Vertical Launch System.
5/20/97	\$9.2	N00024-97-C-4012	Fixed propulsor aft assembly and associated items for the Seawolf class submarines.
6/30/97	\$15.3	DAAE07-96-C-X036	85 Bradley Linebacker M6 vehicles.
7/25/97	\$68.3	DAAE07-96-C-X036	35 Bradley A3 LRIP vehicles.
8/12/97	\$14.0	DAAE07-96-C-X)69	62 MLRS M993 carriers.
8/28/97	\$78.1	N00024-96-C-5231	Eight 5"/54 Mark 45 gun mounts.
9/10/97	\$45.6	DAAE07-97-C-X071	51 M9 Armored Combat Earthmovers (ACE).
11/21/97	\$11.7	DAAE07-97-C-X032	Five XM4 vehicle platforms.
11/24/97	\$6.4	DAAE07-97-C-X065	Conversion of 164 Field Artillery Ammunition Support Vehicles (FAASV) from A0 to A2.
11/26/97	\$36.7	DAAE07-96-C-X036	18 Bradley A3 LRIP vehicles.
12/11/97	\$17.1	DAAE07-96-C-X036	Bradley Fire Support kits to obtain 22 BFIST M7 vehicles.
12/16/97	\$18.4	DAAE07-96-C-X069	29 MLRS M993 carriers.
12/22/97	\$10.6	N00024-94-C-5328	Improvements to the Mark 41 Vertical Launch System.
12/23/97	\$29.4	DAAE07-97-C-X001	Manufacturing development of the Grizzly program.

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