87th Congress
1st Session

COMMITTEE PRINT

PATENT PRACTICES OF THE DEPARTMENT OF DEFENSE

PRELIMINARY REPORT

OF THE

SUBCOMMITTEE ON PATENTS, TRADEMARKS, AND COPYRIGHTS

OF THE

COMMITTEE ON THE JUDICIARY

UNITED STATES SENATE

EIGHTY-SEVENTH CONGRESS, FIRST SESSION

PURSUANT TO

S. Res. 55

Printed for the use of the Committee on the Judiciary

U.S. GOVERNMENT PRINTING OFFICE

72757 WASHINGTON : 1961

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FOREWORD

This report on the patent practices of the Department of Defense was prepared by Thomas C. Brennan of the staff of the Subcommittee on Patents, Trademarks, and Copyrights, under the supervision of Robert L. Wright, former chief counsel of the subcommittee. It is the 11th of a series describing how the various departments and agencies dispose of patent rights in inventions resulting from Government-financed research. These studies supplement the information developed by the subcommittee's public hearings on bills for the establishment of a uniform patent policy for all agencies of Government.

The Department of Defense is furnishing about half of the $12 billion being spent this year for all research and development in the United States. The Department's patent policy has been to acquire only a nonexclusive royalty-free license to use for governmental purposes inventions arising under research and development contracts, with exclusive commercial rights vested in the contractors. The Department itself has recently recognized the need for more flexibility by modifying the Armed Services Procurement Regulation to provide that the Government may acquire title in specified exceptional circumstances. But no one suggests that this modification will conform the Defense Department policy to that of other Government agencies dealing with the same contractors for research in the same scientific areas.

If we are to have a consistent patent policy for all Government agencies, we must find answers to the following questions raised by this report:

Should the inventive fruits of this defense research, paid for by all the taxpayers, be enjoyed by everyone who desires to make use of these inventions through Government ownership of patent titles? Should we continue the present policy of the Department of Defense in vesting ownership of these inventions in the contractor and extend it to civilian agencies, such as NASA and AEC? Or, should we adopt some intermediate position such as that described in this subcommittee's report on the patent practices of FAA, under which the Government may recover its research and development costs out of commercial profits realized by the contractor?

This subcommittee's 11 preliminary reports have demonstrated that Congress must provide a legislative answer to these questions if the U.S. Government, as such, is to have any patent policy.

JOHN L. MCCLELLAN,
Chairman, Subcommittee on Patents, Trademarks, and Copyrights, Committee on the Judiciary, U.S. Senate.

SEPTEMBER 1, 1961.

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PRELIMINARY REPORT AS TO THE PATENT PRACTICES OF THE DEPARTMENT OF DEFENSE

I. Legal Authority as to Patents

A. RESEARCH AND DEVELOPMENT—IN GENERAL

Subject to availability of appropriations, contracts of a military department for services and the use of facilities for research or development, or both, may be for a term of not more than 5 years, and may be extended for not more than 5 additional years.[1]

The military departments, together with other departments authorized to enter into contracts for basic research at nonprofit institutions, are authorized to make grants to such institutions for the support of basic research.[2]

Each military department may use funds appropriated for procurement purposes to acquire copyrights, patents, patent applications, licenses, designs, processes, manufacturing data, and releases (prior to suit) for past patent infringement, when such material is related to supplies or processes used by or for, or useful to, the department.[3]

The Secretary of Defense or his designee, subject to the approval of the President, is authorized to engage in basic and applied research projects essential to the responsibilities of the Department of Defense in the field of basic and applied research and development which pertain to weapons systems and other military requirements. Such projects may be performed under contract with private business entities, educational or research institutions, or other agencies of the Government, through one or more of the military departments, or by utilizing employees and consultants of the Department of Defense.[4]

The winner of design competitions conducted by the military departments pursuant to title 10, United States Code section 2271 for aircraft, aircraft parts, and aeronautical accessories may apply for patent on any feature of the design item originated by him, and if a patent issues he will have exclusive right under it against all persons except the United States or its vendee.[5]

B. RESEARCH AND DEVELOPMENT—DEPARTMENT OF THE AIR FORCE

The Department of the Air Force conducts and participates in research and development programs relating to the Air Force. It may procure or contract for the use of facilities, supplies, and services that are needed.[6]

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[1] 10 U.S.C. 2352.
[2] 42 U.S.C. 1891.
[3] 10 U.S.C. 2386.
[4] 5 U.S.C. 171c(b)(2).
[5] 10 U.S.C. 2273.
[6] 3 U.S.C. 9503.

The Air Force may buy ordnance, signal, and chemical warfare supplies, including parts and accessories, and designs that are considered necessary for experimental or test purposes in the development of the best supplies needed for the national defense.[7]

The Air Force may make or procure gauges, dies, jigs, tools, fixtures, and other special aids and appliances, and specifications and drawings, necessary for the immediate manufacture of arms, ammunition, or special equipment that are necessary to equip the Air Force and are likely to be needed in time of war.[8]

The Department of the Air Force may sell, lend, or give samples, drawings, manufacturing or other information to any contractor or Air Force supplier under approved production plans and to any person likely to manufacture or supply Air Force supplies.[9]

C. RESEARCH AND DEVELOPMENT—DEPARTMENT OF THE ARMY

The Department of the Army conducts and participates in research and development programs relating to the Army. It may procure or contract for the use of facilities, supplies, and services that are needed.[10]

The Army may buy ordnance, signal, and chemical warfare supplies, including parts and accessories, and designs that are considered necessary for experimental or test purposes in the development of the best supplies needed for the national defense.[11]

The Army may also procure materials and facilities necessary to maintain and support it and its military organizations and installations including (1) guided missiles, (2) modern standard items of equipment, (3) equipment to replace obsolete or unserviceable equipment, (4) necessary spare equipment, materials, and parts and such reserve of supplies as is needed to the Army to perform its mission.[12]

The Department of the Army may sell, lend, or give samples, drawings, manufacturing or other information to any contractor for Army supply under approved production plans and to any person likely to manufacture or furnish Army supplies.[13]

The Army may authorize the use of its testing machine for iron, steel, and other materials by any person upon payment of a suitable fee.[14]

D. RESEARCH AND DEVELOPMENT—DEPARTMENT OF THE NAVY

The Department of the Navy procures naval stores and material. It directs the construction, armament, equipment, and employment of Navy vessels and all matters connected with the Navy.[15]

The Department of Navy may make expenditures as it considers appropriate for scientific investigations and research and the Secretary may delegate this authority to any person in the Department of the Navy.[16]

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[7] 10 U.S.C. 9504.
[8] 10 U.S.C. 9505.
[9] 10 U.S.C. 9506.
[10] 10 U.S.C. 4503.
[11] 10 U.S.C. 4504.
[12] 10 U.S.C. 4531.
[13] 10 U.S.C. 4506.
[14] 10 U.S.C. 4508.
[15] 10 U.S.C. 5031(b).
[16] 10 U.S.C. 7203.

The Department may also conduct research and development relating to guided missiles and procure and construct guided missiles.[17]

The Navy may, without advertising, make contracts or amendments or modifications of contracts for services or materials necessary to conduct research and to make or secure reports, tests, models, or apparatus.[18]

Within the Navy Department there exists the Office of the Naval Research which performs the following duties: (1) The encouragement, promotion, planning, initiation, and coordination of naval research; (2) the conduct of naval research in augmentation of and in conjunction with the research and development conducted by the bureaus and other agencies and offices of the Department of Navy; and (3) supervises the administration and control of activities within or for the Department relating to patents, inventions, trademarks, copyrights, and royalties payments and any matters connected with these subjects. In the coordination of naval research, all estimates of appropriations for research by the various bureaus and offices are furnished to the Office of Naval Research.[19]

The sums appropriated for the Office of Naval Research may be used to carry out its duties including (1) administration, (2) conduct of research and development work in Government facilities, and (3) the conduct of research and development work under contracts with individuals, corporations, and educational or scientific institutions.[20]

The Bureau of Ships of the Department of Navy conducts at the David W. Taylor Model Basin, Carderock, Md., investigations to determine the most suitable shapes and forms for the U.S. vessels and aircraft and investigation of other problems of their design. The Navy may authorize experiments to be made at the Model Basin for private parties. Results of private experiments are confidential and may not be divulged without the consent of the persons for whom they are made. However, the data obtained from such experiments may be used by the Navy for governmental purposes subject to the patent laws of the United States.[21]

The Department of Navy may buy patents, applications for patents, and licenses under patents or applications for patents. These purchases are made from appropriations available for the purchase or manufacture of equipment or material to which the patents, applications for patents, or licenses pertain to.[22]

E. ARMED SERVICES PROCUREMENT REGULATION

The Armed Services Procurement Act of 1947,[23] the basic legislative guidelines for military procurement, became effective on May 19, 1948. In implementation of that statute the Assistant Secretaries of the military departments for procurement issued the first armed services procurement regulation, usually abbreviated ASPR. In implementation of the ASPR each department issued a set of procedures: The Army Procurement Procedure (APP), the Navy Procurement Directive (NPD), and the Air Force Procurement Instructions (AFPI).

[17] 10 U.S.C. 7201.
[18] 10 U.S.C. 7522.
[19] 10 U.S.C. 5151.
[20] 10 U.S.C. 5152.
[21] 10 U.S.C. 7303.
[22] 10 U.S.C. 7210.
[23] 10 U.S.C. 2301–2314.

Section IX of the ASPR, pertaining to patent and copyright matters, was issued on July 1, 1949. The ASPR is considered a regulation of the Secretary of Defense under section 638 of Public Law 488, 82d Cong., now 10 U.S.C. 2202. The ASPR is issued by the Assistant Secretary of Defense (Installations and Logistics) (formerly Supply and Logistics), in coordination with the military departments. Since 1949 there have been several revisions in section IX of the ASPR.

It will be observed that there is no statutory provision relating to the disposition of patent rights in inventions developed during Department of Defense research and development contracts. The Department believes the authority to dispose of patent rights is derived from the general authority to enter into contracts.

II. Present Practice

A. ADMINISTRATION

1. Personnel

a. Department of the Air Force

The Air Force patent organization is a unit of the Office of the Judge Advocate General, USAF, under the Chief, Patents Division of that Office. The patent organization comprises a headquarters office and branch offices at three separate locations and presently staffs about 46 professional and 30 clerical employees. The preparation and prosecution of patent applications are at the present time handled by 17 professional employees (including patent attorneys and advisers) and 16 clerical employees who spend the majority of their time on this work. The licensing of patents obtained by the Department of the Air Force is handled by one employee in addition to other duties. The remaining professional and clerical employees are mainly occupied with other patent administrative matters, including those relating to infringement claims, litigation, patent clauses in procurement contracts, patentability investigations and determinations, determinations of rights as between the Government and Air Force employee-inventors, and the administration of the Invention Secrecy Act.

b. Department of the Army

The Army patent organization is a unit of the Office of the Judge Advocate General, USA, under the Chief, Patents Division of that Office. Four of the seven technical services have semiautonomous patent departments and operate independently of the Patents Division, Office of the Judge Advocate General, on all matters not requiring control or coordination. These technical services are Chemical Corps, Ordnance Corps, Quartermaster Corps, and Signal Corps. The Patents Division, Office of the Judge Advocate General, performs patent prosecution functions for the Corps of Engineers, Transportation Corps, Office of the Surgeon General, and other miscellaneous agencies of the Department. The Corps of Engineers and the Transportation Corps have small patent staffs which provide patent counsel to their agencies and act in a liaison capacity between the Patents Division, Office of the Judge Advocate General, and the inventors within their agencies. There are about 154 employees en-

gaged in patent activities within the Army, of which total 85 are patent attorneys or advisers. Of the 154 employees, 64 percent spend the major portion of their time in the overall field of patent prosecution. The licensing of patents owned by the Army is handled by one employee in addition to other duties.

c. Department of the Navy

The Navy patent organization is a unit of the Office of Naval Research and, under the direction of the Assistant Chief of Naval Research for Patents and Patent Counsel for the Navy, is the medium through which the Chief of Naval Research discharges his statutory and delegated responsibilities for the supervision, administration, and control of all activities within the Department relating to patents and related matters. To provide patent service to the entire Naval Establishment, the Navy patent organization comprises a central office in the Office of Naval Research and three operating patent divisions, one each for the material bureaus, Bureau of Weapons, and the Bureau of Ships, and another for the technical bureaus and offices of the Navy. The departmental staff comprises about 33 professional and 33 clerical employees. These employees are engaged in functions relating to patents and copyrights which are comparable to those performed within the Army and Air Force. The licensing of patents obtained by the Navy is a minor part of the duties of one employee.

Patent branches have been established at the major laboratories and field activities of the Navy and are staffed with 72 professional and 50 clerical employees. Patent soliciting is the principal function of these field patent branches and 62 of the field professional patent employees spend about half their time in the preparation and prosecution of patent applications.

2. Performance statistics

a. Department of the Air Force

Statistical breakdown for fiscal years 1948–60 of patents applied for, obtained, and owned by Department of the Air Force

Fiscal year	Patent applications filed	Patents obtained	Patents issued to Department of Air Force as assignee		
			Total assigned by employees	Total assigned by contractors	Total
1948 [1]	87	64	0	0	0
1949	82	92	3	1	4
1950	78	111	12	1	13
1951	83	109	8	2	10
1952	113	69	7	4	11
1953	74	62	15	7	22
1954	76	74	15	22	37
1955	87	62	21	20	41
1956	215	68	12	19	31
1957	236	77	44	11	55
1958	205	150	64	23	87
1959	174	184	91	37	128
1960	180	204	50	102	152
Total	1,690	1,326	342	249	591

[1] Beginning Aug. 1, 1947, the date of the Department of the Air Force's existence as a Department separate from the War Department.

Of the patents obtained, other than the 591 issued to the Department of the Air Force as assignee, the balance are employee-inventions not owned by the Government but licensed for use by or for the Government on a royalty-free, nonexclusive basis.

b. Department of the Army

Statistical breakdown for fiscal years 1938–60 of patents applied for, obtained, and owned by the Department of the Army

Fiscal year	Patent applications filed	Patents obtained	Patents issued to Department of the Army as assignee		
			Total assigned by employees	Total assigned by contractors	Total
1938	100	124	6	5	11
1939	101	96	2	0	2
1940	133	70	7	8	15
1941	186	63	17	0	17
1942	504	122	6	6	12
1943	492	178	8	3	11
1944	727	164	8	0	8
1945	1,456	252	12	1	13
1946	1,028	256	35	9	44
1947	421	207	29	28	57
1948	295	288	94	19	113
1949	229	416	134	58	192
1950	245	547	168	66	234
1951	351	399	104	118	222
1952	365	374	68	153	221
1953	347	371	84	154	238
1954	326	358	65	145	210
1955	340	234	98	84	182
1956	330	288	114	89	203
1957	424	313	107	88	195
1958	361	324	169	90	259
1959	403	420	212	119	331
1960	405	379	189	92	281
Total	9,569	6,243	1,736	1,335	3,071

Of the patents obtained, other than the 3,071 issued to the Department of the Army as assignee, almost all were employee-owned inventions to which the U.S. Government secured a royalty-free license. The handful (less than 50) that were not employee inventions fall into the following three categories:

1. *Private inventors.*—On several occasions the Army negotiated arrangements with private inventors, who had made inventions of particular military interest, to bear the expenses of obtaining the patents in exchange for royalty-free licenses to use the inventions.

2. *Research and development contractors.*—In a few cases, the prosecution of pending patent applications of research and development contractors, who were no longer interested in pursuing them, was taken over by the Army and the patents obtained in exchange for royalty-free licenses. The handling of these applications was under regulations in effect prior to 1945. Current regulations require that the contractor assign title to the Government in such cases.

3. *The British Government.*—In a few cases, the Army obtained patents on inventions owned by the British Government in exchange for a royalty-free license. This was pursuant to an arrangement with the British Government calling for reciprocal undertakings within the United Kingdom by that Government in regard to certain inventions owned by the United States.

c. Department of the Navy

Statistical breakdown for fiscal years 1938–60 of patents applied for, obtained, and owned by the Department of the Navy

Fiscal year	Patent applications filed	Patents obtained	Patents issued to Department of the Navy as assignee		
			Total assigned by employees	Total assigned by contractors	Total
1938	190	103	1	0	1
1939	180	109	0	2	2
1940	164	114	0	1	1
1941	164	110	0	0	0
1942	174	136	0	2	2
1943	345	74	0	1	1
1944	441	69	0	0	0
1945	872	75	1	6	7
1946	2,343	160	0	17	17
1947	425	162	1	23	24
1948	354	246	7	28	35
1949	318	433	3	80	83
1950	404	492	3	80	83
1951	347	603	8	146	154
1952	523	569	10	164	174
1953	816	484	11	180	191
1954	780	377	14	156	170
1955	739	401	25	201	226
1956	785	626	82	208	290
1957	633	616	117	232	349
1958	463	688	129	250	379
1959	698	720	162	224	386
1960	736	683	187	244	431
Total	12,894	8,050	761	2,245	3,006

Of the patents obtained, other than the 3,006 issued to the Department of the Navy as assignee, the balance are employee inventions not owned by the Government but licensed for use by or for the Government on a royalty-free, nonexclusive basis.

In view of the delay between the filing of an application and the issuance of a patent thereon (an average of 3 to 4 years—and longer in the case of certain classified inventions) there is no direct correlation between the number of applications filed and patents issued in a given year.

3. Organization and scope of research and development activities

a. Department of Defense

The Department of Defense is spending in excess of $5 billion per year for the conduct of research and development. The Department of the Air Force accounts for about half of this expenditure. The Department of the Navy is spending in excess of a billion dollars a year, while the Department of the Army is spending just under a billion dollars a year.

While research expenditures for advanced weapons systems have occupied public attention, the R. & D. projects of the Department of Defense cover a variety of military needs. The Department engages in substantial support of basic research by educational institutions in such areas as the physical sciences, life sciences, and the social sciences.

The Advanced Research Projects Agency (ARPA) was established in 1958 to enable centralized control and direction over certain projects of advanced research which do not fall clearly within the re-

sponsibility of a single military department. Within the Department of Defense, ARPA reports to the Director of Defense Research and Engineering and acts on projects assigned by him or the Secretary of Defense. At the present time (1961) these projects include ballistic missile defense, nuclear test detection, advanced propellant chemistry, advanced materials research, reliability of advanced weapons systems, toxicology, and energy conversion.

ARPA carries out its responsibilities by work orders to the military departments and other governmental agencies or by contract or grant of the Office of the Secretary of Defense directly with individuals, private business entities, or educational, research, or scientific institutions. ARPA keeps the Secretary of Defense informed of significant new developments, breakthroughs and technological advances within assigned projects.

Funds for these projects are appropriated directly to ARPA, which makes them available to carry out the work orders or fund the contracts or grants. When the feasibility of an idea or concept under study by ARPA has been demonstrated, the development of that idea or concept may be assigned by the Secretary of Defense to one of the military departments. ARPA is presently spending on the order of $200 million per year.

The Armed Services Technical Information Agency (ASTIA) is the principal documentation center for unpublished technical and scientific reports issued under the R. & D. program. ASTIA seeks to make available to military agencies and contractors technical documents resulting from R. & D. work. It catalogs, abstracts, indexes and stores military classified and unclassified scientific and technical reports. ASTIA is operated by the Research and Development Command of the Air Force, under the policy direction of the Secretary of Defense.

b. Department of the Air Force

The research activities of the Air Force prior to 1961 were centered in the Air Research and Development Command (ARDC). ARDC had four major divisions. The Air Force Ballistic Missile Division (AFBMD), Inglewood, Calif.; the Wright Air Development Division (WADD), Wright-Patterson AFB, Ohio; the Air Force Command and Control Development Division (AFCCDD), L. G. Hanscom Field, Bedford, Mass.; and the Air Force Research Division (AFRD), Washington, D.C.

Grouped functionally within the various divisions were the following operating centers, which perform research and development, testing, and engineering services:

Operating center	Location	Nature of research
Air Force Missile Test Center	Patrick Air Force Base, Fla.	Operate Atlantic Missile Range; and range support for missile and space programs.
Air Force Flight Test Center	Edwards Air Force Base, Calif.	Aircraft category II tests; captive missile systems and subsystems evaluation; and flight evaluation of research vehicles.
Air Force Special Weapons Center.	Kirtland Air Force Base, N. Mex.	Nuclear energy research, development, engineering support, and testing to include nuclear weapon systems, nuclear power applications, associated phenomena and environment.
Arnold Engineering Development Center.	Arnold Air Force Station, Tenn.	Gas dynamics and propulsion research, development, and test.
Air Force Missile Development Center.	Holloman Air Force Base, N. Mex.	Execute Air Force responsibilities incident to White Sands Missile Range; air-to-air missiles and drone category II tests; operate inertial guidance test facility; and probe operations.
Air Proving Ground Center	Eglin Air Force Base, Fla.	Atmospheric and space probe operations; test and integration of interceptor aircraft into operational environment; and test electronic systems and subsystems, munitions, and targets.
Rome Air Development Center.	Griffiss Air Force Base, N.Y.	Intelligence devices; ground communications devices; ground environment of surveillance, approach and landing, navigation, and electromagnetic radiation warfare.
Wright Air Development Division.	Wright-Patterson Air Force Board, Ohio.	Guidance systems; flight control; propellers and rotors; testing; powerplants; ground equipment; ground equipment (aerial reconnaissance); airborne equipment; aeromedical equipment; human factors research; airborne electronics equipment; materials; aeronautical sciences research in chemistry-mathematics-physics-fluid dynamics-mechanics-system dynamics; and aerodynamics. This division manages all of the Air Force-manned space programs and is the center of Air Force bioastronautics activities.
San Antonio Research and Development Procurement Office. (The San Antonio office is the R. & D. procuring activity for the Arctic Aeromedical Laboratory, Ladd Air Force Base, Alaska; the School of Aviation Medicine, Air University Command, Randolph Air Force Base, Tex.; and the Air Force Personnel and Training Research Center, Lackland Air Force Base, Tex.)	Lackland Air Force Base, Tex.	Personnel resources research; maintenance personnel research; operator personnel research; social science research and qualitative personnel requirements information; aeromedical training; perceptual problems of flight; medical aspects of flying safety; Air Force preventive medicine; medical standards in aviation; Air Force clinical medicine; aeromedical problems of atomic warfare; aviation physiology; and air evacuation.
Air Force Cambridge Research Center.	L. G. Hanscom Field, Mass.	Geophysics; electronics; and human engineering.
Air Force Office of Scientific Research (AFOSR).	Washington, D.C.	Lets contracts for basic research.

The Air Force recently reorganized its research and development activities and has given them new designations.

The most significant change is the extraction of the Air Force Research Division from the Air Force Research and Development Command to a separate command level titled "Office of Aerospace Research" which reports directly to the Air Force Chief of Staff.

Other changes and redesignations include:

The Air Materiel Command is now the Air Force Logistics Command;

The Air Research and Development Command is now the Air Force Systems Command;

The Air Force Research Division is now the Office of Aerospace Research, under which are included the Air Force Office of Scientific Research, and the Air Force Cambridge Research Laboratories;

The Wright Air Development Division is now the Aeronautical Systems Division;

The Air Materiel Command Ballistic Missile Center is now the Ballistic Systems Division;

The Air Force Command and Control Development Division is now the Electronic Systems Division;

The Air Force Ballistic Missile Division is now Space Systems Division.

The Aerospace Corp., a private research organization, was established in the summer of 1960, to serve as the technical arm of the Air Force ballistic missile and space programs. The Aerospace Corp. is an outgrowth of the former relationship between the Air Force and Space Technology Laboratory, Inc. This latter relationship is being terminated by the Air Force as the result of concern in the Congress that it gave Space Technology a decided advantage over its competitors.

Aerospace has about 2,000 employees working on Government projects worth $3 billion. These include the Samos "spy-in-the-sky" program, the Discoverer and Dynasoar programs, the Saint (satellite inspection and rendezvous system) and Air Force aspects of the Transit (navigation), Advent (communications), and Mercury (man in space) programs. The policy of Aerospace is not to become involved in the production of space hardware. Its building and equipment in Los Angeles are owned by the Air Force. Aerospace hopes that from its Air Force fees it will accumulate enough capital to establish its own laboratory. Under the original Aerospace contract the Government receives only a royalty free license to practice inventions arising from the contract.

The Rand Corp., the Mitre Corp., Pan American Airways, and the Vitro Corp. are other private organizations from which the Air Force receives advice and assistance in the development of its weapon systems and the pursuit of its research programs.

c. Department of the Army

The research activities of the Department of the Army are centered in the seven technical services: The Corps of Engineers, the Chemical Corps, the Ordnance Corps, the Signal Corps, the Transportation Corps, the Quartermaster Corps, and the Army Medical Service.

The Army's R. & D. program supports basic research as well as applied. The Army spends about $50 million per year for basic research by some 550 laboratories, universities, and industries, and 80 Army and other governmental installations. Part of this research is conducted in Japan and in 14 countries in Europe.

Research centers of the Army technical services

CORPS OF ENGINEERS

Operating center	Location	Nature of research
Waterways Experiment Station.	Vicksburg, Miss.	Dust control; flexible pavements; metal and plastic landing mats; mobile test laboratories for concrete, asphalt, and soils; research on soil-vehicle relationships; soil stabilizers; subsurface exploration equipment; trafficability maps and aerial photographs; and trafficability on soils and snow.
Snow, Ice, and Permafrost Research Establishment.	Wilmette, Ill.	Aerial photo interpretation of snow regions; Arctic research investigations; avalanche research investigations; bearing strength of ice sheets, excavation of frozen ground; glaciology research investigations; snow cover maps; and snow, ice, and frozen ground research.
District engineer	Philadelphia, Pa.	Prefabricated breakwaters and prefabricated piers.
Engineer Research and Development Laboratories.	Fort Belvoir, Va.	Air compressors; high and low pressure bridging and steam crossing equipment; buildings and utilities; camouflage and deception supplies and equipment; construction and maintenance equipment; crevasse detectors electrical equipment; engines, gasoline and diesel, firefighting equipment, forestry equipment, and fortifications and obstacles; industrial cases and equipment; infrared; liquid fuels distribution; mapping; materials for construction and equipment; mine clearance; mine detectors; mine planting equipment; nuclear power and heating plants; pneumatic tools; processing and packaging; pumps; research on demolition techniques and equipment; snow and ice removal equipment; sprayers, insect; trailers and semitrailers; turbines; gas and water purification equipment.

Research centers of the Army technical services—Continued

ORDNANCE CORPS

Operating center	Location	Nature of research
Aberdeen Proving Ground.	Aberdeen, Md.	Ballistic research; development of protective coatings; engineering tests; equipment and/or professional operations in support of: Human engineering evaluation.
Diamond Ordnance	Washington, D.C.	VT fuzes and electronic devices for ordnance items.
Frankford Arsenal	Philadelphia, Pa.	Ammunition for recoilless rifles; ammunition up to and including 30 millimeter, except metallic belt links, caliber .30, .50, .60, and 30 millimeter; cartridge actuated devices; cartridge cases; drill ammunition for AA guns and recoilless rifles: fire control equipment including spotting rifles; MT fuzes for artillery projectiles; projectiles; and recoilless rifles.
Ordnance Tank-Automotive Command.	Detroit, Mich.	Combat and transport vehicles; gun mounts for automotive vehicles; hydropneumatic recoil mechanism for cannon peculiar to automotive vehicles; and supporting research in land locomotion.
U.S. Army Ordnance Special Weapons-Ammunition Command.	Dover, N.J.	Centralized command over all Army ordnance special weapons and conventional ammunition operations—development, procurement, supply control, maintenance—of subordinate commands; the Ordnance Ammunition Command and Picatinny Arsenal.
Picatinny Arsenal	do	Complete rounds of: Artillery and mortar ammunition; atomic artillery and demolition type munitions (less nuclear components); mines; grenades; bombs and pyrotechnics; demolition charges; drill ammunition JATO's; warheads (nonatomic, for guided missiles and rockets), and explosives.
White Sands Missile Range.	Las Cruces, N. Mex.	Engineering tests; equipment and/or professional operations in support of: Long range research on rockets and guided missiles.
Watervliet Arsenal	Watervliet, N.Y.	Cannon for medium and heavy field artillery, AA, antitank, and combat vehicles; mortars, with carriages and carts.
Office of Ordnance Research.	Durham, N.C.	Fundamental research of ultimate interest to the Ordnance Corps, primarily with universities and nonprofit institutions.
Ordnance Weapons Command.	Rock Island, Ill.	Broad areas of research and development covering the responsibilities delineated under Rock Island Arsenal, Springfield Armory, and Watertown Arsenal; and weapons systems.
Rock Island Arsenal	do	Arm racks: Carriages for towed cannon; hand carts; hydropneumatic recoil mechanisms;launchers, rockets, ground-to-ground; limbers; linking and delinking machines; recoil mechanisms; and target materiel.
Springfield Armory	Springfield, Mass.	Automatic aircraft weapons, all calibers; belt links and clips, up to and including 30 milimeter; chargers; feed mechanisms; flash hiders; ground type weapons, up to and including 30 milimeter; machineguns, up to and including 30 millimeter; and mounts for machineguns.
Watertown Arsenal	Watertown, Mass.	Carriages for towed and heavy field guns; mounts for AA guns; recoil mechanisms for AA guns; and rocket launchers (ground-to-air).
Ordnance Materials Research Office.	do	Materials research.

QUARTERMASTER CORPS

Quartermaster Research and Engineering Command.	Natick, Mass.	Chemicals and plastics; dispensing and handling equipment; environmental protection; foods; individual clothing and equipment; mechanical equipment; and test methods and techniques.

SIGNAL CORPS

Laboratory Procurement.	Fort Monmouth, N.J.	Auxiliary equipment; Avionics; basic research; combat surveillance; components; electronic countermeasures; electronic data processing systems; ground photography; infrared-ultraviolet; materials (in communication equipment); meteorological instrumentation; radar; radio communications; radio direction finding; radiological detection instruments; sensory devices; sound and light; television; testing equipment; and wire communications.

Research centers of the Army technical services—Continued

TRANSPORTATION CORPS

Operating center	Location	Nature of research
U.S. Army Transportation Research Command.	Fort Eustis, Va.	Aircraft (all R. & D. for Army aviation); marine transport; materials; motor transport; rail; terminal operations; transportation engineering; and transportation research of ultimate interest to the Transportation Corps, primarily with universities and nonprofit institutions.
CHEMICAL CORPS		
Army Chemical Center Procurement Agency.	Army Chemical Center, Md.	Air sampling; electronics and instrumentation; engineering of protective devices; investigation of chemical and medical properties of toxic compounds; munitions engineering; and processing and production of chemical materials.
Biological Warfare Laboratories.	Fort Detrick, Md.	Air sampling; electronics and instrumentation; investigations of biological and medical properties of infectious agents; investigations of vaccines and antitoxoids; munitions engineering; and processing and production of biological materials.
Dugway Proving Grounds.	Dugway, Utah	Air sampling; chemical and biological munitions proof testing; cloud physics; ecology and epidemiology; and electronics and instrumentation.
ARMY MEDICAL SERVICE		
U.S. Army Medical Research and Development Command.	Washington, D.C.	Basic research in medical sciences; biostraunatics; biophysics; blood, blood derivatives, and blood substitutes; dentistry; diseases of animals transmissible to man; internal medicine and metabolism; medical supplies and equipment; neuropsychiatry and stress; preventive medicine; and traumatic surgery, shock and burns.
Armed Services Medical Materiel Coordination Committee.	do	Dental equipment and supplies; field equipment; hospital equipment and supplies; laboratory equipment and supplies; medical sets, kits, and outfits; optician's equipment, supplies, and instruments; surgical dressing materials; surgical instruments, equipment, and supplies; and X-ray equipment and supplies.

In the area of human factors research (research activities involving man other than the medical sciences), projects involve personnel selection, classification, utilization, and assignment; personnel training, motivation, and leadership; research in the area of training devices and simulators; research in areas of psychological warfare and guerrilla activities; and human engineering.

The Army also makes extensive use of the science of operations research in such areas as tactical, logistical, intelligence, and organizational problems and systems analysis. The Army is advised by the Operations Research Office of Johns Hopkins University and the Human Resources Research Office of George Washington University.

d. Department of the Navy

The research activities of the Department of the Navy are centered in the following units:

BUREAU OF NAVAL WEAPONS

Name of activity	Location	Nature of research
Naval Air Test Center	Patuxent River, Md.	Perform research and development on aircraft and their components and design, develop and test air navigational electronics, traffic control, communications and identification systems.
Naval Air Material Center	Philadelphia, Pa.	Conduct research, design, manufacture, test, and evaluate aeronautical accessories, powerplants, aircrew safety devices, equipment, structures, and materials.
U.S. Naval Air Test Facility	Lakehurst, N.J.	Evaluate aircraft launching and recovery systems and related equipment, and provide test facilities and support to contractors engaged in development of such systems.
U.S. Naval Air Development Center.	Johnsville, Pa.	Provide technical assistance to Navy in development of optimum naval air systems with major emphasis in broad categories of combat air, air defense, and antisubmarine warfare. Involves research design, development, test, and evaluation functions; special studies and investigations in field of aviation medicine.
Naval Air Turbine Test Station.	Trenton, N.J.	Conduct tests and evaluation of aircraft engines and their components.
Naval Air Rocket Test Station	Dover, N.J.	Conduct tests and evaluation of rocket engines, their components and propellants.
Naval Parachute Unit	El Centro, Calif.	Conduct research, development, test, and evaluation of parachutes and related assemblies, pilot escape methods and systems, retardation and recovery systems and rescue, survival and personnel safety equipment.
Naval Avionics Facility	Indianapolis, Ind.	Conduct research, development, engineering, design, production, overhaul, repair, and modernization of avionics equipment.
U.S. Naval Missile Center	Point Mugu, Calif.	Testing and evaluating guided missiles, their components and related weapons systems.
Allegany Ballistics Laboratory (contractor operated).	Mineral County, W. Va.	Research, design, development, and pilot-plant production of cast double-base rocket propellants and complete rocket units which serve a wide variety of end uses.
Ordnance Aerophysics Laboratory (contractor operated).	Daingerfield, Tex.	Research and development testing (performs full-scale jet engine testing as required for guided missile devices); research and development in field of propulsion and techniques which will maintain highest standards of jet engine test facility operation.
U.S. Naval Weapons Station	Yorktown, Va.	Research and development work related to high explosive loading of current and new weapons.
U.S. Naval Ordnance Laboratory (NOL has 4 field testing stations located at Fort Monroe, Va., Solomons, Md., Fort Lauderdale, Fla., and Brighton, Md.).	White Oak, Md.	Conduct research, design, development, test, and technical evaluation of complete ordnance systems, assemblies, components, and materials pertaining to existing, advanced, and proposed weapons, principally in field of missiles and underwater in ordnance. Conduct research in ordnance sciences.
U.S. Naval Ordnance Laboratory.	Corona, Calif.	Conduct research, analysis, feasibility studies, development, design, engineering, testing, evaluation, inspection, and surveillance relating to ordnance materials, assemblies, and systems principally in field of guided missiles and related electronic devices.
U.S. Naval Ordnance Missile Test Facility.	White Sands Missile Range, N.Mex.	Development and testing of guided and unguided missiles.
U.S. Naval Ordnance Test Station.	China Lack, Calif.	Research, design, development, limited production, test, and technical evaluation of ordnance materials, components, assemblies, and systems, principally in fields of rockets, guided missiles, underwater ordnance, and aircraft fire control.
U.S. Naval Ordnance Test Station, Pasadena Annex.	Pasadena, Calif.	Conducts research, development, and testing of underwater ordnance.
U.S. Naval Ordnance Unit	Key West, Fla.	Develops, tests, and evaluates underwater ordnance equipment.
U.S. Naval Propellent Plant	Indian Head, Md.	Research, development, and pilot plant production of both solid and liquid propellants and development of propulsion systems.
U.S. Naval Weapons Laboratory.	Dahlgren, Va.	Conduct research and development programs concerned with ordnance systems, ammunition and components thereof, countermeasures and ordnance materials.
U.S. Naval Underwater Ordnance Station.	Newport, R.I.	Conduct research, development, test, and evaluation of underwater weapons systems.

BUREAU OF MEDICINE AND SURGERY

Name of activity	Location	Nature of research
National Naval Medical Center.	Bethesda, Md.	Conduct basic and applied research and development concerned with health safety and efficiency of naval personnel.
U.S. Naval Medical Research Laboratory.	New London, Conn.	Conduct medical research and development on problems peculiar to shipboard, submarine, and diving medicine.
Naval Medical Field Research Laboratory.	Camp Lejeune, N.C.	Conduct research, development, and testing in medical, dental, and allied sciences, with particular emphasis on problems of field and amphibious medicine.
Naval School of Aviation Medicine.	Pensacola, Fla.	Prosecute research on approved projects in aviation medicine and allied sciences.
Naval Medical Research Unit No. 2.	Taipei, Taiwan.	Provide through medical research essential and currently unavailable information on diseases and medical disorders of potential military significance (endemic or epidemic) in Far East; provide biological knowledge required for controlling animal and insect vectors of area diseases.
Naval Medical Research Unit No. 3.	Cairo, Egypt.	Medical research work on diseases of military importance (endemic and epidemic) in Middle East; also conduct research on dental problems.
Naval Medical Research Unit No. 4.	Great Lakes, Ill.	Experimental, epidemiological, and clinical research on the etiology, prevention, control, and treatment of acute respiratory diseases in military personnel, especially streptococcal disease and rheumatic fever.

OFFICE OF NAVAL RESEARCH

U.S. Naval Research Laboratory.	Washington, D.C.	Conduct scientific research and development in physical sciences and related fields directed toward new and improved materials, equipment, techniques, and systems for Navy.
U.S. Naval Training Device Center.	Port Washington, N.Y.	Conduct research leading to development of and production of (when assigned) training devices, to fulfill established requirements of training agencies; provide logistic support for training equipment developed by it; study training devices and recommend solutions, training techniques, and systems.
U.S. Navy Underwater Sound Reference Laboratory.	Orlando, Fla.	Conduct research and development furthering science of underwater sound measurement; provide naval activities with resulting knowledge, techniques, and standardized instrumentation and calibrate instruments.
Arctic Research Laboratory (contractor operated).	Point Barrow, Alaska.	Conduct research on geography of Arctic Slope, including terrain, geology, lithology, pedology, microclimatology, and plant, animal, and human ecology.
Naval Biological Laboratory.	Oakland, Calif.	Conduct fundamental research on disease agents potentially applicable to naval problems and requirements; provide technical advice and assistance to naval service on problems involving disease agents and other biological problems.

BUREAU OF SHIPS

Name of activity	Location	Nature of research
U.S. Naval Engineering Experiment Station.	Annapolis, Md.	Conduct applied research, development, investigation, evaluations, and tests in fields of physics, chemistry, metallurgy, and electricity with respect to marine engineering equipment, materials, and processes.
David W. Taylor Model Basin.	Carderock, Md.	Conduct fundamental, applied, and developmental research to develop designs of naval ships, design of propellers for naval ships and torpedoes, efficient structure of ships, such countermeasures as may be assigned, means for protection of submarines and surface ships from effects of underwater explosions; perform developmental tests of aircraft, guided missiles, and their components; and conduct program of research in mathematical analysis and computer techniques.
New York Naval Shipyard.	Brooklyn, N.Y.	Conduct research, development, analytical testing, evaluation, inspection, and standardization in fields of electrical and mechanical engineering, chemistry, metallurgy, and physics, including acoustical studies, vibration and shock, navigational instruments and gyrodynamics.
U.S. Naval Boiler and Turbine Lab.	Philadelphia, Pa.	Conduct applied research, development, investigation, and full-scale tests of boilers, fuel oils, refractories, turbines, engines, reduction gears, and associated auxiliary machinery and equipment comprising main propulsion systems of ships.
U.S. Navy Mine Defense Lab.	Panama City, Fla.	Conduct investigation, development, and evaluations to provide defense against mines and torpedoes, and conduct applied research in applicable related physical sciences.
U.S. Naval Radiological Defense Lab.	San Francisco, Calif.	Conduct basic and applied research on physical and biological effects of hazardous nuclear and thermal radiations; develop and evaluate radiac devices and shielding equipment or materials for protection of personnel, reclamation or decontamination procedures for shipboard aircraft and land areas.
U.S. Navy Underwater Sound Laboratory.	New London, Conn.	Conduct research, development, system studies, and engineering evaluation in fields of sonar, radio, radar, infrared, and related sciences.
U.S. Navy Electronics Laboratory.	San Diego, Calif.	Conduct research, development, and tests in field of electronics and related fields of engineering and science, including radio, radar, sonar, oceanography, and the instrumentation for and analysis of environmental weapons effect and human factors.
Norfolk Naval Shipyard.	Portsmouth, Va.	Conduct underwater explosion research using, if necessary, ships or scale models of ships as targets for tests, to record and analyze pertinent data, and to report results.

BUREAU OF SUPPLIES AND ACCOUNTS

U.S. Naval Supply Research and Development Facility.	Bayonne, N.J.	Research and development in fields of supply engineering, commissary operations, and clothing and textiles.

BUREAU OF YARDS AND DOCKS

U.S. Naval Civil Engineering Laboratory.	Port Hueneme, Calif.	Conduct research, development, and proof tests of various types of BuDocks equipment for use at advanced bases and shore activities, and in amphibious operation; develop techniques, equipment, material, and structures best suited for construction, maintenance, and operation of shore-type activities.

OFFICE OF CHIEF OF NAVAL OPERATIONS

Name of activity	Location	Nature of research
U.S. Naval Observatory	Washington, D.C.	Conducts research in fields of celestrial mechanics, astrometry, astrophysics, time, frequency, and related geophysical problems.
U.S. Navy Hydrographic Office.	Suitland, Md.	Research and development effort primarily in field of applied oceanography, with emphasis on oceanographic publications, surveys in support of military operations, and development of techniques for the prediction of environmental conditions which affect military operations.

B. POLICY AS TO RETENTION OF TITLE

1. By employees

It is the policy of the military departments to permit its employees to retain title to their inventions whenever permissible under the provisions of Executive Order 10096 of January 23, 1950. The Supreme Court opinion in *United States* v. *Dubilier Condenser Corporation* (289 U.S. 178 (1933)) has been followed, and the taking of title from an employee has not been required unless the invention bears a direct relation to the official duties of the employee. Whenever the domestic rights are required to be assigned to the Government, the foreign rights are also assigned or an option to acquire such rights is obtained for the Government.

Typical of the regulations issued by the military services to implement Executive Order 10096 is SECNAV Instruction 5870.3 of the Department of the Navy of January 5, 1955. This instruction provides in part:

> 7. *Conditions for Assignment.* The Department of the Navy may require assignment of title to inventions made by employees of the Naval Establishment and to any patents that may be issued on such inventions if any of the following conditions are present:
>
> a. If the invention was made during working hours; or
>
> b. If the invention was made with a contribution by the Government of facilities, equipment, materials, funds, or information, or of time or services of other Government employees on official duty; or
>
> c. If the invention bears a direct relation to or was made in consequence of the official duties of the inventor.
>
> 9. *When Assignment is Required.* When any of the conditions set forth in paragraph 7 * * * are present, the domestic rights and, in the discretion of the Chief of Naval Research, foreign rights in and to the invention shall belong to the Government if:
>
> a. The conditions are equitably sufficient to justify assignment thereof by the employee to the Government; and
>
> b. The Government has sufficient interest in the invention to require assignment thereof by the employee.

> If it should be found that assignment is not required under a. and b. of this paragraph, the employee nevertheless shall be required to grant to the Government a nonexclusive, irrevocable, royalty-free license in the invention and under any patents which may issue thereon, with power to grant licenses for all governmental purposes. When none of the conditions set forth in paragraph 7 * * * are present, the entire right, title, and interest in and to the inventions shall be left in the employee, subject to law.

Although a literal construction of Executive Order 10096 could have resulted in decisions at variance with prior Supreme Court cases, the order has been administered in such a manner as to produce results in accord with the case law on division of rights in inventions. Accordingly, the order has had little direct effect on the determination of rights. A review of the statistics, however, since the issuance of the order, indicates a higher percentage of cases in which the Government is taking title rather than a license. The cause for this trend could be attributed to the effect the existence of the language of the order has upon the Government employee, or the trend could be due to the nature of employment of the research and development scientists making the majority of the inventions.

It is the view of the services that promulgation of Executive Order 10096 has had a definite effect in making continued Government service seem less attractive to Government scientists and engineers. The services also feel that the Executive order may have diminished the incentive of Government employees to make inventions. It should be noted that for similar reasons the services opposed the policy enunciated in the Executive order when that policy was proposed in the Attorney General's report to the President (1947).

2. By contractors

The Department's policy with respect to inventions by contractors is set forth in ASPR paragraph 9–107. This states that the Department of Defense generally obtains on behalf of the Government a comprehensive license of free use but does not require that full title to the new inventions be assigned to the Government.[24]

The regulation goes on to state that the comprehensive license, which is irrevocable, nonexclusive, nontransferrable, and worldwide in scope, permits, royalty free, any use of the inventions by the Government itself, any use by a Government contractor or subcontractor in connection with the performance of a Government contract, and any use by anyone in connection with projects funded by the Government, including the mutual security program. The inventions covered are those which are conceived, or first actually reduced to practice, in the course of performing any contract or modification thereof, having experimental, developmental, or research work as one of its purposes, or in the course of performing such work on the understanding in writing that a contract would be awarded.

Thus, in defense procurement contracts involving no expenditure of Government funds for research and development, the Government

[24] Under the first DOD policy in 1949, the contracting officer was expected to consider the Government's taking title in certain situations. The Department in later editions of ASPR moved away from the concept of taking title and removed the decision as to title acquisition from the contracting officer and placed it at the department level.

would not obtain any patent rights to inventions made by the contractor in performing contracts. However, if a supply contract has research and development as one of its purposes the patent rights clause prescribed by ASPR would be included.

The 1961 revision of ASPR states that despite this general policy of acquiring only a license, the Department recognizes that there may be situations in which it will be desirable in the public interest to obtain full title to the inventions made under the contracts.[25] The regulation spells out three examples of such situations: (1) In a new technological field where there is no significant nongovernmental experience to build upon, and inventions which may be made under the contract would be likely to dominate the field or be of critical significance in it; (2) where the services of the contractor are largely those of coordinating and directing the work of others; and (3) where title in the Government would recognize the—

> overriding public interest in inventions in fields directly relating to the health or safety of the public, if their availability for public use will not depend on patent incentives.

Contracting officers are required to consider each proposed contract having research and development as one of its purposes in the light of the general license policy and in light of any circumstances such as those spelled out in the regulation which would favor Government acquisition of title. If the contracting officer with his technical and patent advisers believes a particular case is appropriate for a deviation from the general policy the matter is referred to higher authority in the military departments for decision.

The title clause provided in ASPR (9–107.2(c)) requires the contractor to agree to grant the Government all right, title, and interest in and to inventions conceived or first actually reduced to practice in the course of performing the contract. The contractor may file for patents overseas, if the Government itself does not so file, provided that the Government will have the power under the foreign patents issued to the contractor to issue sublicenses for use in behalf of the Government and in furtherance of the foreign policy of the United States, including the right to grant royalty-free licenses to U.S. citizens who wish to practice the patent overseas. The contractor may not have to grant title to some inventions on which he has made formal application for patent before the contract is awarded but which have not been actually reduced to practice. In such cases he must grant the Government the same rights as the Government acquires under the standard license clause. At the time use of the title clause is approved by higher authority, such higher authority may determine the extent to which subcontracts must also have a similar title clause. The contracting officer may during the course of contract performance permit subcontracts to contain only the license clause if the contracting officer determines that Government acquisition of title under a particular subcontract is not essential for the purposes of the prime contract.

Under the standard license clause of ASPR (9–107.2(b)), which is employed in the vast majority of contracts, the Government obtains a nonexclusive royalty-free license to use throughout the world any

[25] 9–107.1(c) ASPR.

invention covered by the clause and to permit anyone else to use the invention in projects funded by the Government. The contractor, however, retains title to the invention and may apply for a patent thereon in this country and overseas, and if a patent is issued, the contractor will have the customary right to exclude all others from use of the invention, except the Government and those performing Government contracts or utilizing mutual security funds. An additional sentence in the patent rights clause provides that the Government's license does not extend to the manufacture or use of the inventions "for the purpose of providing services or supplies to the general public in competition with the contractor or the contractor's commercial licensees in the licensed fields." The Department of Defense interprets this language to mean that the Government would not have the benefit of the royalty-free license if it would use the invention in business rivalry with the contractor in the commercial market with the aim of obtaining the trade of the public at the expense of the contractor and realizing a profit thereby. The Government's power to use the invention for such a purpose is protected by 28 U.S.C. 1498, provided that reasonable compensation for such unlicensed use is paid to the contractor at his request, in accordance with the law. Additional language has recently been added to this sentence in the standard license clause to make clear that the Government does have the benefit of its royalty-free license when using the inventions covered in providing services or supplies "as a governmental function pertaining to the general public health, safety, or welfare."

If the contractor does not elect to file an application on an invention subject to the provisions of the contract, he is required to transfer all right, title, and interest in the invention to the Government upon request of the contracting officer and to furnish such documents as will enable the Government to file a patent application on the invention or to continue the prosecution of the application. The Department states that its interest in filing applications on such inventions is primarily defensive. The Department has concluded after study that mere publication would be wholy inadequate under existing patent law to protect the Government against subsequent claimants.

The Government's license is worldwide in scope and thus is applicable even in those foreign countries in which the contractor has obtained patents. If the contractor elects not to file a patent application in a foreign country within 9 months from the date a corresponding U.S. application is filed or 6 months from the date permission is granted to file foreign applications where such filing had been prohibited for security reasons or for any longer period as may be approved by the contracting officer, he must assign to the Government at the request of the contracting officer, his right, title, and interest in the invention in the foreign country in which no patent application has been filed, subject to a license in the contractor with an option to grant sublicenses. The contractor's obligation to assign his entire interest to the Government when he decides not to file a patent application is limited to the extent of his right to grant such rights without incurring any obligation to pay royalties or other compensation to others solely on account of such a grant.

In certain unusual situations specified in the regulation, contracting officers may exclude from the grant of any rights to the Government certain inventions on which a patent application has already been filed or on which a patent has been issued but which has not been actually reduced to practice. These situations are the following:

(i) the contractor has expended sums in developing the invention (as represented by research and development costs and expenses for preparing and prosecuting the patent application) which are relatively large in comparison to the amount of the proposed contract or such portion of the proposed contract amount as can be allocated in advance for the development of such an invention (in determining the sums expended by the contractor there shall be included only amounts which can be allocated to the invention which is to be excluded; such sums shall not include the entire cost of a research department or program which cannot be allocated as above provided);

(ii) the practicability of such an invention has been established as by engineering design;

(iii) the invention covers a basic material and it is not the purpose of the contract to develop such material; or

(iv) the invention is useful only for military purposes and the contractor does not have facilities for furnishing the item to the Government in production quantities.

Any inventions to be excluded from the license grant by reason of the foregoing circumstances shall be specifically identified and listed in the contract schedule.[26]

The subcommittee has been informed by the Department of the Air Force that during fiscal year 1960 there were 16 contracts in which inventions were excluded from the grant to the Government. Eighty-seven inventions were excluded. During the same period the Department of the Army excluded 11 inventions in accordance with ASPR 9–107.2(a) and the Department of the Navy made three contracts in which inventions were excluded.

The contractor is required to exert all reasonable efforts to secure the inclusion in any subcontract of a patent rights clause containing, with certain exceptions, all the provisions of his clause. In the event of refusal by a subcontractor to accept such a patent rights clause, the contractor shall not proceed with the subcontract without written authorization of the contracting officer or unless there has been a waiver of the requirement. The contractor is not required, when negotiating with a subcontractor, to obtain in behalf of the Government any rights in inventions other than as provided in ASPR. The contractor is not precluded from separately negotiating with a subcontractor for additional rights in the inventions for the contractor's own behalf, but any costs so incurred must be met by the contractor.[27]

With respect to any invention made by employees of the contractor and relating to the production or utilization of special nuclear material or atomic energy within the purview of the Atomic Energy Acts of 1946 and 1954 the contractor agrees to furnish to the Atomic Energy

[26] 9–107.2(a) ASPR.
[27] 9–107.2(g) ASPR.

Commission through the contracting officer complete information regarding such invention, the Commission to have the sole and conclusive power to determine whether and where a patent application shall be filed, and to determine the disposition of the title to and rights under any such application or any patent that may issue thereon.[28]

In all contracts for research and development work relating primarily to supplies or services intended for the general public for civil defense purposes, the contractor grants the Government an irrevocable, nonexclusive, nontransferable, and royalty free license to practice, and cause to be practiced by or for the U.S. Government, throughout the world, each invention arising out of the contract. The Government receives the right to sublicense others to practice the invention in the manufacture, use, and sale of any article or in the use of any method for the purpose of providing supplies or services to the general public in the furtherance of the Nation's civil defense.[29]

When a military department, under its established procedures, provides substantial financial support to a contractor's specific product, improvement program, or specific projects within its independent research program, the military department may obtain for the Government patent license rights to inventions, improvements or discoveries conceived or first actually reduced to practice during or as a result of the support of such programs.[30]

The failure of a contractor to report, as required by the contract, the making of an invention in the performance of a Department of Defense contract was disclosed in the trial on accounting of the case of *Farrand Optical Company* v. *United States* (U.S.D.C. (S.D.N.Y.), 175 F. Supp. 230). Patent No. 2,588,414, which covered an essential component of the equipment at issue in the *Farrand* suit had been assigned to Farrand by the inventor. During the trial the inventor was called as a Government witness and on cross-examination it was developed that the invention was conceived and reduced to practice in the performance of a contract with the Department of the Navy.

Investigation showed that no report had ever been filed disclosing inventions made during the contract. This matter was brought to the attention of the Navy Department and it has made a formal demand under the contract. The matter is pending before the Armed Services Board of Contract Appeals.

Two patents relating to small balloons were taken out by General Mills, Inc., during the period when General Mills was operating under a cost-plus-fixed-fee contract with the Navy Department for the so-called Sky Hook, a large balloon. While the contract included a clause requiring General Mills to report the inventions and give the Government a royalty-free license, the inventions covered by the two patents were not disclosed. The Department of the Navy submitted this matter to the Department of Justice for appropriate action. Before any action was taken, however, General Mills granted the Government a license in settlement of the controversy.

3. By grantees

The policy of the military departments as to patents resulting from grants for support of scientific research, as authorized by Public Law

[28] 9–107.4 ASPR.
[29] 9–107.5 ASPR.
[30] 9–107.6 ASPR.

85–934 (42 U.S.C. 1891) is an implementation of the Department of Defense policy as set forth in Department of Defense Directive 3210.2 and Department of Defense Instruction 3210.3. It is provided that the grantee shall give to the U.S. Government an irrevocable, nonexclusive, nontransferable, royalty-free license to practice or have practiced for its benefit for governmental purposes, each invention (whether or not patentable) throughout the world. The grantee is required to advise the grantor of the filing of each patent application in any country and to furnish a copy thereof to the grantor. The grantee is required to give the grantor the right to file patent applications for any inventions on which grantee does not intend to file and on request to furnish grantor duly executed instruments fully confirmatory of license or title rights. When the grantee obtains a patent, it may exclude all others from the commercial use of such inventions. No effort is made by the services to examine what policy, if any, a grantee may have with respect to the commercial exploitation of its patents.

4. Patent infringement and competitive bidding

In 1958 the Air Force was confronted with the situation as to whether it was required to accept the low bid on certain supplies even though the low bidder would necessarily have to infringe valid patents, the Air Force being able to secure its need from the licensee of the patentee at a reasonable cost.

The Air Force requested the advice of the Comptroller General, whose views are set forth in his opinion B–136916 of August 25, 1958 and October 6, 1958. The Comptroller General expressed the opinion that to reject the low bid and to make an award to one of the licensees for the purpose of enforcing and protecting the rights of the patent owners and their licensees would constitute an improper restriction of competition. The Comptroller General held that the low bid could not be rejected as unreasonable or the bidder found not responsible merely because the award to the low bidder would result in infringement of valid patents. A bidder is not required to show that he is a licensee of any particular patented invention as a condition precedent to receiving consideration for its bid.

It was pointed out that section 1498, title 28, United States Code, was designed for the purpose of furnishing patentees adequate compensation for the use of their patents by or on behalf of the Government and at the same time preventing the obstruction of Government activities by disputes between private parties respecting such patents. The Comptroller General rejected the contention that indiscriminate use of the rights afforded to the Government under 28 U.S.C. 1498 would be destructive of the public policy considerations underlaying the patent law. The Comptroller General stated that section 1498 appears to constitute a modification of the patent law by limiting the rights of patentees insofar as procurement by the Government is concerned. It was held the armed services lacked authority to protect the patent system by dispensing with the requirements of formal advertising.

The Defense Department has reflected the Comptroller General's ruling in ASPR section 2–407.8. Contracting officers are instructed that authority to negotiate awards may not be used "merely because

the item to be bought is patented." When the procurement is made by formal advertising and the standard patent indemnity clause is included, the award must be made to the low bidder "even though not the patent owner or licensee, if otherwise responsive."

C. POLICY AS TO RIGHTS IN DATA

1. General policy

The Department's policy on rights in data is undergoing revision. This report discusses the policy as presently set forth in ASPR, section IX, part 2.

"Proprietary data" is any data which provides information concerning the details of the contractor's secrets of manufacture to the extent such information is not disclosed by the design itself and to the extent the contractor has protected it from unrestricted use by others.[31] This definition does not include information in the public domain, information which is disclosed by inspection and analysis of the product itself ("reverse engineering"), and information which has not been protected by the owner against its unrestricted use by others.

> It is the policy of the Department of Defense to encourage inventiveness and to provide incentive therefor by honoring the "proprietary data" resulting from private developments and hence to limit demands for data to that which is essential for Government purposes. The activity responsible for initiating a purchase request, after consultation with the procurement activity whenever feasible, will carefully determine the use contemplated for the data to be acquired and will specify only such data as is determined to be necessary to satisfy such use. Generally it should not be necessary to obtain "proprietary data" to satisfy Government requirements. The acquisition of data from a subcontractor shall be governed by the nature and circumstances of the subcontract, it being the intent of the Department of Defense that in obtaining data originating with subcontractors, the contractor shall, insofar as carrying out his obligations under a prime contract is concerned, be guided by the same policies and procedures as if the subcontractor were contracting directly with the Government and should not request unlimited rights in "proprietary data" where such rights are not required by the Government under the prime contract.[32]

2. Acquisition of data in contracts for research and development

In a contract which has as one of its principal purposes research and development work and calls for models of equipment or practical processes, the contractor is required to furnish, for the price of the work, all data resulting directly from the performance of the contract. In addition, the contractor must furnish any other data, proprietary or not, necessary for reproduction or manufacture of the equipment, or performance of the process which is developed. The only exceptions to this requirement are data relating to component parts in the product or process developed which are either

[31] 9–201(c) ASPR.
[32] 9–202.1(a) ASPR.

standard commercial items or items (including minor modifications) developed at private expense and previously offered for sale, provided always that sufficient information is furnished to enable the Government to practice the process, procure the part or an adequate substitute, and thus enable reproduction or manufacture of the item. A contractor may be compensated separately for previously developed proprietary data when the contractor and the Government agree in the negotiation preceding the execution of the contract that such proprietary data will be necessarily used in the development of the product or process.

The data acquired under research and development contracts is subject to unlimited use by the Government.[33] In practice, there may be an occasional "sweep-in" of background proprietary data of the contractor which was not identified at the negotiation of the contract.

3. Acquisition of data in procurement contracts

The ASPR precludes proprietary data being requested in advertised contracts and in contracts for standard commercial items. In other supply contracts, the ASPR provides that proprietary data will be obtained only when a clear Government need for such data is established.[34]

If the needs of the Government require "proprietary data," the ASPR calls for a specific negotiation for such data, and the contractual requirement is listed as a separate contract item.[35] The so-called "fail safe" clause [36] makes it necessary for the Government to specify in the contract schedule any proprietary data which it may desire to purchase. The purpose of this clause is to prevent the requirement of proprietary data by way of a military specification elsewhere incorporated by reference in the contract. When proprietary data is obtained by negotiation under a procurement contract, the purpose for obtaining the data will govern the use. If the data is obtained for the purpose of enabling the Government to establish additional sources of supply, no restriction will be placed upon use of the data. Where the data has been obtained for some limited purpose, such as emergency manufacture by the Government, the data will be received subject to limitation on use.[37] Data other than proprietary data is obtained by the Government without limitation on use.[38]

When the Government has a need for establishing multiple sources of supply for items which were initially developed at private expense, it is the policy of the Department of Defense that proprietary data will be obtained for this purpose only where multiple sources cannot otherwise be established. Preference is expressed in ASPR for having the contractor license and, to the exent necessary, provide technical assistance to other sources. In the alternative, the acquisition of proprietary data developed at private expense may be avoided in many cases by providing for the development of suitable substitutes for sole source items through the use of performance specifications. The policy is intended to honor contractors' proprietary data, because it is

[33] 9–202.2(b)(2) ASPR.
[34] 9–202.1(b) ASPR.
[35] 9–202.1(b) ASPR.
[36] 9–203.2 ASPR.
[37] 9–202.2(b)(1) ASPR.
[38] 9–202.2(a) ASPR.

recognized that it is in the Government's interest to foster private development of items having military usefulness.[39]

4. Acquisition of data in inventions of employees

The military departments require by regulation that employees report inventions made during working hours or with a contribution by the Government or inventions bearing a direct relation to or made in consequence of the official duties of the employee. The report of invention is required to include a complete description of the invention. The Government acquires at least an unrestricted license to use such data pursuant to the provisions of Executive Order 10096 and implementing regulations.

Unrestricted rights in data involving inventions not made under the conditions described above is sometimes acquired by the military departments in exchange for an agreement to file a patent application for the employee at Government expense.

The Government acquires unrestricted use of technical information, know-how and specialized processes created by an employee as part of his official duties, whether or not an invention is involved or the employee retains title to the invention.

5. Acquisition of data arising out of research grants

With respect to data arising out of grants for support of scientific research, as authorized by 42 U.S.C. 1891, the Government has the right to publish, translate, reproduce, deliver, and dispose of all data, including reports, drawings, blueprints, and technical information which are delivered to the Government under the grant, and to authorize others to do so. With respect to data which is not originated during the research, a grantee is required to give a similar license but only to the extent that grantee has the right to give such license without paying compensation to others. At the time of giving or reporting any such data, grantee is required to make all reasonable efforts to advise the grantor of all invasions of the right to privacy contained therein and, of all portions of such data copied from work not composed or produced during the research and not licensed.

D. FOREIGN FILING

1. General policy

With respect to inventions of employees, whenever the domestic rights are required to be assigned to the Government, the foreign rights are also assigned or an option to acquire such rights is obtained for the Government.

Concerning contractors, the contractor is entitled to file applications on subject inventions in foreign countries. If the contractor elects not to file within 9 months from the date a corresponding U.S. application is filed or within 6 months from the date permission is granted to file foreign applications where such filing had been prohibited for security reasons, then the contractor is required to advise the Government so as to allow the Government the opportunity to file.[40] Where work is to be performed outside the United States and the subject matter of the contract is classified for reasons of security,

[39] 9–202.3 ASPR.
[40] 9–107.2e ASPR.

the contractor is not allowed to file a patent application in any country without the written approval of the contracting officer.[41]

2. Department of the Air Force

The Department of the Air Force has never filed a patent application in a foreign country. The Department is of the view that the expense of such a procedure outweighs any benefits.

3. Department of the Army

The Department of the Army, through the Department of Commerce, in compliance with Executive Order 9865,[42] filed a substantial number of patent applications in England. This project has been abandoned for lack of funds. Moreover, a study of the Government foreign patent protection program made in 1955 by an interagency working committee recommended recision of Executive Order 9865. This order directs that all—

> Government departments and agencies shall, whenever practicable, acquire the right to file foreign patent applications on inventions resulting from research conducted or financed by the Government.

The Army has informal bilateral working arrangements with the Department of Defense of Canada and the British Joint Service's Mission under which patent applications on certain inventions of mutual defense interest owned by one country may be filed in the other country. During the period from July 1, 1957 to June 30, 1959, 98 applications on U.S.-owned inventions were filed in Canada by Canada, and 6 were filed in the United Kingdom by the British. During this period no applications were filed in any other foreign countries. During the same period the U.S. Army filed in the United States 20 applications on inventions owned by the United Kingdom and none on inventions owned by Canada.

4. Department of the Navy

The Department of the Navy has filed and is continuing to file applications for Canadian Letters Patents on those inventions owned by the U.S. Government (or with respect to which the U.S. Government has acquired title to the foreign rights) which cover weapons or weapon components that are to be manufactured in Canada. The Department of the Navy has filed 187 patent applications in Canada and 6 patent applications in Great Britain.

E. PATENT AND TECHNICAL INFORMATION AGREEMENTS

1. General policy

In order to assure the availability of patents and technical information for the mutual security program, the United States has negotiated a series of international bilateral agreements, generally known as "Agreements for the Interchange of Patent Rights and Technical Information for Defense Purposes." [43] The first of these agreements

[41] 9–106.1 ASPR.

[42] Federal Register, vol. 12, No. 118, June 17, 1947.

[43] For a survey of the background of these agreements, see "Exchange of Patent Rights and Technical Information Under Mutual Aid Programs," study No. 10, Senate Subcommittee on Patents, Trademarks, and Copyrights. For a more complete explanation of these agreements see "Patents and Technical Information Agreements," study No. 24 of the Senate Subcommittee on Patents, Trademarks, and Copyrights.

was between the United States and Italy and was signed in October 1952. Similar, but not identical agreements, have been entered into with Australia, Belgium, Denmark, France, the Federal Republic of Germany, Greece, Italy, Japan, the Netherlands, Norway, Turkey, Spain, and Portugal.

In many cases patent rights and technical information required for defense production abroad are privately owned, and it is the purpose of the agreements to encourage the flow of privately owned rights through commercial channels. When privately owned technical information is transmitted by one government to another for purposes of information only, the agreements provide that the recipient government shall treat the information as disclosed in confidence. If the transmission to a foreign government is made by the U.S. Government without the authorization of the private owner, the owner has the right under section 506(b) of the Mutual Security Act of 1954 [44] to bring an action against the United States for damages which may have resulted.

The agreements provide that when one of the contracting governments owns an invention or has the right to grant a license to use an invention for defense purposes the other contracting government shall be entitled to use the invention without cost, except to the extent that there may be liability to a private owner.

2. Operation and practice

The Department of Defense and the military services do not keep records of the number of U.S. patents owned by governments of countries which are parties to the bilateral agreements which the U.S. Government has been authorized to use or have used for defense purposes. Such information is considered not necessary, as under section 506(b) of the Mutual Security Act of 1954 the exclusive remedy of the owner of the patent is by suit against the United States in the Court of Claims or in the appropriate district court of the United States, or by administrative settlement; these courses being available under title 22, United States Code, section 1758 (b) and (c). When foreign-owned patents are asserted against the United States, investigation is made to determine whether the U.S. Government is entitled to a royalty-free license under a patent interchange agreement. One example of the operation of the licensing provision is the U.S. patents on landing mirrors used on the flight decks of U.S. aircraft carriers which were developed by a British naval officer and which are used without payment of royalties since the United States has a license under the bilateral agreement with the United Kingdom.

With respect to U.S. patents owned by foreign nationals, as distinct from foreign governments, the United States is not entitled to a license under the bilateral agreements any more than a foreign country is entitled to a license under a foreign patent owned by a U.S. citizen. The United States does occasionally purchase a license under U.S. patents owned by foreign citizens but this is not regarded as the result of the operation of the bilateral agreements other than the general statement in the bilaterals that private rights will be recognized.

The nations with whom the United States has agreements for the interchange of patents and technical information were advised during

[44] 68 Stat. 852 (1954); 22 U.S.C. 1758 (supp. III, 1956).

negotiations for the agreements that where it is determined that the Government has title to patented inventions it is not necessary for a foreign government or foreign firm to obtain a license to use for defense purposes. Under an informal reciprocal arrangement with the United Kingdom pertaining to Government assigned inventions the Department of the Army has filed U.S. patent applications for 49 United Kingdom inventions, and the United Kingdom has filed 20 United Kingdom patent applications on U.S. inventions and has retained information as prior Crown records for 282 other U.S. inventions. Crown records afford a protection against later applicants fiilng patent applications in the United Kingdom and then filing a claim for compensation. These cases, though not considered by the Department of the Army as resulting from the patent interchange agreements, accomplish the purpose of such agreements. A similar arrangement exists with Canada; however, the United States has no patent interchange agreement with Canada. The Canadian Government has filed 187 patent applications in Canada at its own expense on inventions developed by the Navy in return for a license to the Canadian Government. The United Kingdom Government, at its own cost, has filed 4 patent applications on inventions developed by the Navy and has retained 23 additional cases as Crown records. Title to these Canadian and United Kingdom filed patent applications is retained by the United States but under the exchange agreements the United Kingdom is entitled to licenses and Canada is permitted a license in return for assuming the cost of filing in Canada.

Licenses for use of foreign patents owned by U.S. citizens are handled by private license agreements between the U.S. citizen and the foreign user whether it be a government or a private firm. If a private agreement for a license under foreign patents and for transfer of technical information relates to material on the munitions list maintained by the Department of State, such agreements are reviewed by the Department of Army, Navy, or Air Force for the Department of Defense. Such review is primarily for security reasons to determine whether the particular information should be allowed to pass to the particular country or firm abroad and second, to see that it contains clauses which will prevent a charge for inventions under which the U.S. Government is licensed if material embodying the inventions should be procured abroad by or for the United States or with U.S. funds. These agreements frequently do not list specific patents but license use of all patents which may pertain to a specific piece of equipment.

The Office of Munitions Control of the State Department serves as the point of receipt within the executive branch of proposed agreements between persons residing in the United States and foreign persons covering the manufacture abroad of munitions list articles or the furnishing of technical assistance on such articles. During fiscal year 1960, the Department received and referred for review to the Department of Defense 96 proposed agreements of this nature.

Under DOD Directive 2000.3 technical information which is privately owned may be released by Department of Defense agencies to foreign governments if any one of the following conditions are met:

1. The owner expressly consents to the proposed release;

2. The United States, by contract or otherwise, has acquired or is entitled to acquire, the information under circumstances which permit the proposed release; or

3. The Secretary of the military department concerned, or his designee, determines, under the authority of the Mutual Security Act of 1954, as amended, that—

(*a*) The exigencies of the requirement for release to further the common defense do not allow sufficient time to obtain the consent of the owner, or

(*b*) The owner refuses consent and the best interests of the United States would be served by the release.

In ordinary practice permission of the owner is always sought. The Department of the Army has made at least 51 requests for permission to release technical information which might be privately owned. Permission is believed to have been granted at least 11 times. For the cases in which permission was not granted the foreign government was referred to the owner for direct negotiations. The Department of the Army is unaware of receipt of privately owned technical information from a foreign government, and is aware of only six cases in which the United States received information from a foreign firm.

The international interchange of technical information involves the following offices within the Department of the Air Force: the Assistant Chief of Staff for Intelligence; the Assistants for Foreign Developments and for Security, Deputy Chief of Staff, Development; and the Assistant for Mutual Security, Deputy Chief of Staff, Materiel. According to these offices several thousand requests are received each year by the Air Force from foreign governments for disclosures. In approximately 120 such requests in each of recent years the material has been found to contain privately owned technical information and the requests have been denied. The Air Force has no information concerning the frequency of privately owned technical information being transmitted from a foreign government or firm to the U.S. Government.

Although the Department of the Navy receives a considerable volume of technical information from foreign countries, it does not receive much privately owned information except under one exchange agreement involving solid propellants to which both the United Kingdom and the United States Governments and private citizens in each country are parties. One exception is situations in which offers of license to the U.S. Government are made by private foreign firms or citizens who wish to interest the U.S. Government in adopting and using their inventions in return for a payment. The Navy receives about two a month of these submissions but these are not brought about by the exchange agreements.

Unclassified technical information in which the U.S. Government has an unrestricted right is turned over to the Office of Technical Services, Department of Commerce, from whom anyone, including foreign representatives, may secure copies for a small fee.

No administrative claims are known to have been asserted against any of the military services for unauthorized use of a patented invention or for damages resulting from the disclosure of information under the Mutual Security Acts of 1951 or 1954.

The following suits have been filed against the U.S. Government under the Mutual Security Acts for unauthorized disclosure of privately owned technical information to a foreign government and for unauthorized use of patented inventions.

1. *Ushakoff* v. *U.S.*, U.S. District Court for the District of Massachusetts, was filed on March 18, 1952, under provisions of the Mutual Security Act of 1951. A stipulation of discontinuance without prejudice was entered in October 1957. A petition was filed in the U.S. Court of Claims in January 1958 under 28 U.S.C. 1498 without reference to the Mutual Security Act.

2. *Farrand Optical Co.* v. *United States* was filed in May 1955 in the district court, southern district of New York, under provisions of the Invention Secrecy Act (35 U.S.C. 183) and the Mutual Security Act of 1954 (22 U.S.C. 1758). In a decision dated July 23, 1959, plaintiff was held entitled to receive compensation under both statutes (amount to be determined by an accounting trial).

3. *Kaplan* v. *United States*, U.S. Court of Claims. On motion of the Department of Justice the court removed those counts based on the Mutual Security Act but retained the counts for infringement by the U.S. Government based on 28 U.S.C. 1498.

4. *Bert H. Adams* v. *United States*, was filed in the Court of Claims in May 1960. No decision has been reached.

Standardization of equipment is one purpose of the interchange program. Standardization programs are government-to-government operations. Transmittal of information under such programs is accomplished through existing commercial relationships or through channels established by negotiations between the parties. If specialized know-how from private U.S. firms is required by a foreign producer the foreign producer enters into a private agreement with the U.S. firm. This may take the form of a technical assistance agreement whereby U.S. engineers work abroad in explaining and applying know-how. Foreign technicians may be trained by the U.S. firm. If privately owned foreign patents are involved such private agreements usually provide a license under the patents. The principal difficulty is in agreeing upon the price to be paid for such assistance and license. Another problem is that the U.S. measurements are not in the metric system and all drawings have to be converted prior to use abroad.

The military departments review private agreements in order that they may comply with security requirements and to prevent royalty charges on inventions licensed to the United States if U.S. funds should be used to procure from the foreign firm. The Departments are of the view that the transmittal of information aimed at the standardization of weapons is being adequately accomplished.

The Department of the Army receives thousands of requests each year from foreign governments for technical information. In addition, 66 data exchange agreements exist with foreign governments and 63 mutual weapons development program projects are in operation. More are proposed.

The Department of the Army has found the present program adequate in assuring the unimpeded flow of information needed for defense purposes.

The Office of the Assistant for Foreign Developments, Deputy Chief of Staff, Development, Department of the Air Force, which controls the administration in the Air Force of some 200 data exchange agreements with the NATO countries, reports that the present program is adequate. The flow of material transmitted in accordance with these agreements has increased to substantial rates.

The Department of the Navy considers existing legislation adequate. It finds that insofar as Government-owned information is concerned, the exchange of information has not been impeded except as required by security considerations. There has been some reluctance by private owners in this and the other countries to permit free disclosure of privately owned technical information and authority granted the Government by the Mutual Security Act to disclose information in its possession has not been exercised. Foreign governments have not disclosed much information owned by private firms. Considerable progress has been made in preparing procedures under international agreements for reciprocal filing of patent applications on classified inventions. The Navy Department believes the reluctance to disclose will be overcome as the owners obtain the right to secure patent protection in the countries to which the information will be disclosed.

F. USE OF PATENTS BY PARTIES RETAINING TITLE

1. By employees

The military departments do not maintain records as to the extent of the commercial use of inventions made by employees who have retained title.

The Department of the Air Force from the recollection of its patent personnel was able to cite the following examples of inventions made by employees of the Air Force or its predecessor services, title to which was left in the employee, and which enjoyed relatively large-scale commercial use:

Patent No.	Subject	Patent No.	Subject
2,185,801	Oleo device for landing gear and the like.	2,419,980	Temperature control unit.
2,185,802	Do.	2,075,068	Illumination means for indicator instruments.
2,186,011	Shock absorber.	2,293,777	Warning signal lamp.
2,110,869	Electrical signaling apparatus.	2,007,217	Lubricating rubbing blocks for electrical circuit interrupter.
2,188,801	Oil dilution system.	2,316,188	Ignition timing device.
2,317,427	Viscosity control valve.	2,581,450	Resuscitator.
2,349,327	Do.		

The Department of the Army from the recollection of its patent personnel was able to cite the following examples of inventions made by employees of the Army, title to which was left in the employee, and which are known to have enjoyed commercial use:

Patent No.	Subject	Patent No.	Subject
2,575,360 [1]	Magnetic fluid torque and force transmitting device.	2,688,203	Folding light automatic rifle.
2,622,713 [1]	High speed magnetic fluid clutch.	2,716,923	Firing mechanism for a rifle.
2,629,471 [1]	Radial flux magnetic fluid clutch.	2,920,664	Tire demounting stand.
2,549,797	Fire control mechanism.	2,774,576	Blender.
2,590,854	Automatic hammer safety for automatic guns.	2,810,473	Sterile hypodermic needle holder.
2,512,638	Fire control selector for automatic firearms.	2,938,999	Antenna-switching system.
		2,803,819	Object locating system.
		2,810,960 [1]	Precision engraving instrument.
		2,758,307	Face shield.

[1] The U.S. patent is assigned to the Government. Commercial use was made of the corresponding foreign rights which were left with the inventor.

The Department of the Navy from the recollection of its patent personnel was able to cite the following examples of inventions made by employees of the Navy, title to which was left in the employee, and which are known to have enjoyed commercial use:

Patent No.	Subject
2,688,746	Duplexer (a device used in almost all radar systems and which permits the use of a single antenna for both transmitting and receiving).
2,705,255	Strain insulator to reduce static in aircraft long-range communications.
2,558,030	Hydraulic fluid.
2,458,540	Shark repellant.

2. By contractors and grantees

The role of Government-financed R. & D. in creating products with profitable commercial application is a considerable one. Department of Defense research and development may lead to products for which a commercial market presently may not exist, but which may arise in later years in a manner not contemplated at the time of the invention. Among the many civilian products and techniques which resulted from research work for military purposes are antibiotics, electronic computers, cold-weather footwear, moisture-proof packaging, plastic hearing aids, anticorrosion coating, precooked frozen meals and treatments of waste water.

The military departments do not maintain records as to the extent of commercial use of contractor-owned inventions. In order to obtain information as to the patent aspects of the research and development activities of the Department of Defense, the subcommittee sent a questionnaire to 120 prime contractors.[45] The 120 firms in the survey included the 100 leading prime contractors as determined by the net value of DOD R. & D. contracts awarded during fiscal 1959 plus 20 of the smaller prime contractors. Of the 100 corporations receiving the largest volume of prime contracts during 1959, 24 are among the 100 largest patent holding corporations as judged by the number of patents issued to them during the 17 years, 1939–55.[46]

The subcommittee was first interested in determining the expenditures by these contractors of their own funds for research and the dollar volume of R. & D. contracts awarded to these firms by the Department of Defense during the 1949–59 period. No uniform accounting system has yet been devised to determine strictly what constitutes research and development in contrast to expenditures for production. However, an effort was made to obtain approximately accurate data as to expenditures for research. It should be observed that there are differences between a company-funded R. & D. program and a Government-sponsored R. & D. program. A company-funded development often does not require the extensive prototype engineering effort usual in DOD contracts. Also, the development of military equipment is generally more costly than the development of commercial equipment due to the severe environmental conditions to which military equipment will be subjected.

[45] Summaries of the responses from the contractors will be found in the appendix.

[46] See "Distribution of Patents Issued to Corporations (1939–55)," study No. 3 of the Subcommittee on Patents, Trademarks, and Copyrights of the U.S. Senate Committee on the Judiciary.

While the cost of applied research relating to specific weapons or defense activities has always been reimbursable on military contracts, the Department of Defense since July 1, 1960, is sharing the costs of contractor's independent basic research and development programs. A contractor's independent R. & D. is that which is not sponsored by a contract, grant, or other arrangement. Basic research is defined in ASPR 15-205.35 as—

> that type of research which is directed toward increase of knowledge in science. In such research, the primary aim of the investigator is a fuller knowledge or understanding of the subject under study, rather than any practical application thereof.

Costs of contractor's independent development are allowable to the extent that such development is related to the product lines for which the Government has contracts, provided the costs are reasonable in amount and are allocated as indirect costs to all work of the contractor on such product lines. In cases where a contractor's normal course of business does not involve production work, the cost of independent development is allowable to the extent that such development is related and allocated as an indirect cost to the field of effort of Government reserach and development contracts. The reasonableness of expenditures for independent R. & D. is determined in the light of various pertinent considerations such as previous contractor R. & D. activity, cost of past programs and changes in science and technology.

The procedure followed in connection with reimbursement for the cost of a contractor's general research program is for the contractor to present to the contracting officer a statement describing its proposed program for the contractor's research program and the amount budgeted. The contractor and the Government then negotiate to determine the proportion of cost of the program to be reimbursed. The services seek to achieve "advance understandings" on the extent to which the Government will share in the costs. The ASPR in 15-107 states that—

> it is important that prospective contractors, particularly those whose work is predominantly or substantially with the Government, seek agreement with the Government in advance of the occurrence of special or unusual costs in categories where reasonableness or allocability are difficult to determine.

The subcommittee has been informed by the Department of Defense that during fiscal year 1960 the services entered into advance agreements with contractors to contribute to their independent research and development in the amount of $125 million. The Department estimates that $96 million of this sum is allocated to Government work. When reimbursement is made to the contractors under this program, it is the policy of the Department of Defense not to seek any rights in patents which may evolve from such independent research and development programs.

Of the 78 corporations responding to the subcommittee's questionnaire, 18 reported expenditures of private funds for research in excess of the dollar volume of DOD R. & D. contracts received during the

period of the study. Among the 17 were such leading DOD contractors as Westinghouse Electric, the Radio Corp. of America, General Motors, and Eastman Kodak. At the other end of the scale, 5 of the 78 firms (all 5 being small DOD contractors) reported that they had not expended any private funds for research.

The following table shows the breakdown as to the percentage of sales to the Government in relation to total sales during the period of the study of the firms which responded to this question of the subcommittee:

Percentage of sales to Government:	*Number of firms*	Percentage of sales to Government—Continued	*Number of firms*
0 to 19	11	70 to 79	5
20 to 39	14	80 to 89	9
40 to 59	5	90 to 94	7
60 to 69	3	95 to 100	20

The 78 corporations supplying information reported that they had filed 7,988 patent applications during the period 1949–59 as a result of inventions resulting from DOD R. & D. contracts. Of the 78 corporations, 11 reported that they had not filed any applications as the result of DOD contracts. The number of applications filed ranged from the 804 of General Electric down to several firms filing a single application.

As a result of the 7,988 patent applications filed by these contractors, over 4,000 patents have been issued, some 800 applications are known to have been rejected or abandoned and most of the remaining applications are still pending. This percentage of applications rejected by the Patent Office or abandoned by the contractor does not reflect any appreciable variation from the usual ratio of patent applications filed to patents issuing. Of the 78 corporations responding, 15 (including the 11 which did not file any applications) have not so far been issued any patents as the result of DOD R. & D. contracts. General Electric has obtained the most patents, 471.

The 78 corporations reported that during the 10-year period of the study they had filed a total of some 61,300 patent applications on inventions resulting from both Government financed and privately financed research. General Electric (8,957), General Motors (6,610), Radio Corp. of America (5,513), and Westinghouse Electric (5,428) were the leaders among the 78 corporations in the filing of patent applications. Of the 61,300 applications, about 34,100 have matured into issued patents, some 8,700 applications are known to have been rejected or abandoned and most of the remaining applications are still pending. General Electric (5,660), General Motors (4,077), Westinghouse Electric (3,228), and Radio Corp. of America (2,635) have received the largest number of patents. The 78 firms include 18 of the 100 largest patent holding corporations as judged by the number of patents issued to them during the 17-year period 1939–55.

Of the 78 firms surveyed by the subcommittee, one-third report commercial use either directly or by licensees of one or more patented inventions resulting from DOD contracts. However, the present commercial use of such inventions by these firms or their licensees is quite limited and the number of patents involved is less than 7 percent of the total number obtained from DOD contracts. For example, Western Electric is aware of commercial use of only 4 of the 247 patents it has obtained, while General Electric has commercially exploited

less than 50 out of 471. Some firms reporting little or no use of these patents at the present time anticipate future commercial applications and are establishing special units to exploit new products or processes. Normally it is necessary for the contractor to expend additional funds for the commercialization of the invention.

Many of the inventions used constitute modifications in an existing product or a single component of the final product. Those presently being used commercially cover inventions incorporated in the following products or processes: Coaxial noise generator; subminiature gyro compass; metal helicopter rotor blade; circuit breakers; magneto and ignition distributor for cylinder engines; altitude controller units; commercial aircraft; welding machines and methods; piezoelectric materials for accoustical devices; nickel-cobalt magnetic plating for magnetic recorders; scoring camera; windshield wiper blade; gas turbine compressors; capacitors; jet engine equipment; electronic tubes; semiconductor devices; gas turbine engines; aircraft propellers; transmission devices; pilot operated shutoff valve; self-locking control device; cathode-ray storage tubes; fused junction silicon diodes; process for winding precision potentiometers; cryogenic and liquid oxygen technology; electronic invoicing machine; coaxial directional couplers; aircraft autopilots; simplified loran; magnetic amplifiers; alpha-numeric translator; magnetic drum head; magnetic core pulse-forming switch; communication system circuits, and magnetrones.

Twenty-two of the seventy-eight firms included in the subcommittee study have licensed to others the use of inventions resulting from DOD contracts. A number of the largest contractors are parties to broad cross-licensing agreements. These provide for the automatic licensing of patents, including inventions from R. & D. contracts, within the scope of the agreement. For example, the General Electric Co. has cross-license agreements in the electronics field with RCA, Westinghouse, Sylvania, Western Electric, Raytheon, and Philco. GE estimates that 188 of the 471 R. & D. patents held by it are covered by these agreements, which do not provide for the payment of a royalty for the use of a particular invention. In general, the patents effected by these agreements have been placed on the register of the Patent Office as available for licensing to others upon reasonable terms. But GE has received no royalty income from licenses granted for the use of inventions resulting from DOD contracts.

Some of the firms covered by the study are members of the Manufacturers Aircraft Association, pursuant to which aircraft patents are cross-licensed under royalty-free agreements. The amount of royalty income from R. & D. inventions so far received by prime contractors in this field is, therefore, relatively insignificant. For example, the Hughes Aircraft Co. has granted licenses under 210 R. & D. patents, but has received only $1,210 in royalties.

In addition to the firms included in the subcommittee survey, it is known that many other contractors have obtained patents as the result of R. & D. contracts of the Department of Defense and that some of the patents are being utilized commercially. An examination of R. & D. activities reveals how an Army contract aimed at discovering portable huts for troops has developed into a profitable business involving the sale of houses made of a plastic foam material lined with kraft paper;

and how a Navy contract to develop an automatic data handling machine has led to commercial applications involving the automatic recording of temperatures and pressures and the transmitting of weather data from remote observation stations.[47]

Defense-supported research has opened the door to commercial applications in the field of telemetry, the science of measuring and reporting of physical phenomena. The sales of the telemetry industry have risen from $1 million annually in 1945 to over $100 million in 1960.

The electronics industry is 3½ times larger today than it was in 1950. Production for the military increased fivefold during the Korean war to account for one-half of the $5.2 billion industry volume. The Electronic Industries Association states that "New and expanding markets will evolve from the application of space-age technology to electronics production for commerce, industry, and the consumer." [48] Since 1957 the Army Signal Corps has spent $7 million in the micromodule research program, which is aimed at saving space in portable communications, helmet radios, guided missiles, and satellites. Defense financed research is taking place in such areas of special scientific interest as molecular electronics, magnetics, thermoelectrics, solid state physics, cryogenics, and microwave technology. The "Electronics 1960 Fact Book" also confirms that "Increasing electronic missile dollars is a prime factor behind the remarkable growth of the electronic industry during recent years.[49]

The Boeing Airplane Co., which received 76 prime Defense Department R. & D. contracts during the period of the study, currently has 32 percent of its sales in commercial products. Boeing has established a new division for the express purpose of using research discoveries which have potential commercial application. Boeing states that more than 250 products or processes have been included in the new division, and that licensing agreements, patent sales, subcontracting, and other arrangements will be explored in connection with their use. Military research at Boeing has led to such products as cookie flour, industrial furnaces and decalcomanias. As food for space travel, Boeing has developed a way to make flour from algae. The company believes the high nutrient value of the algae flour offers advantages for hospital diets and geriatric foods.[50]

Under a program sponsored by the Air Force's Air Material Command, Aerojet-General Corp. (which received 247 prime Defense Department R. & D. contracts during the period of the study) has experimentally transformed ammonia, a cheap and plentiful chemical, into hydrazine, an important space fuel, through atomic radiation. Hydrazine can be produced for 25 cents a pound through the new method, compared with an estimated cost of $1.65 a pound when made by conventional chemical techniques.[51]

The extent to which firms may benefit from DOD R. & D. contracts is indicated by certain contracts awarded by the Signal Corps of the Department of the Army. The Signal Corps has informed the sub-

[47] For a survey of commercial items developed from Department of Defense R. & D. contracts see article "Sword to Plowshare: Military Research Brings Growing Flood of Civilian Products," Wall Street Journal, June 10, 1959, and reprinted in Congressional Record Appendix, June 19, 1959, pp. A5307–5309.
[48] "Electronics Industry 1960 Fact Book," Electronic Industries Association, p. 6.
[49] Ibid., p. 39.
[50] Wall Street Journal, Aug. 24, 1961.
[51] Wall Street Journal, Dec. 7, 1960.

committee that it is currently employing 27 commercial contractors on research programs for semiconductor devices; 40 commercial firms on electronic parts and materials projects, and 13 commercial firms on quartz crystal units. With respect to the semiconductor programs, the Signal Corps has stated that the advancement of the state of the art has opened the door to the creation of a new industry with tremendous growth potential. Many civilian applications have been made possible in a period of time estimated by the Signal Corps to be perhaps 75 percent shorter than would have been possible without Government support.

3. By Government

The military departments do not maintain records as to the extent of commercial use of Government-owned inventions by licensees. Among the inventions known to be in extensive commercial use is the antibiotic commonly referred to as "Bacitracin." In this category also are the antimalarials, chloroquin, and primaquin. There is commercial use of other invitations owned by the military departments on behalf of the Government, but the departments have no way of determining the degree of use, since requests for licenses have been relatively few, and records are not kept to indicate whether inventions are being used commercially without explicit license.

In an effort to gain some information as to commercial use by licensees the subcommittee addressed certain questions to those firms which had received licenses from the services over a 20-year period. During the period 1937–58, 152 licenses were issued to 89 companies. Of the 89 companies, only 49 firms responded. Some of the remaining companies had gone out of business, had merged with other firms, or were unable to answer the questions because of incomplete records. Another difficulty is that the license frequently covered only a method, process, or minor component of the finished product. Under these circumstances it was difficult to arrive at the exact dollar value of the license. However, an effort was made to arrive at an approximate value.

Of the 49 companies which responded, it was found that 25 of the licensed inventions had been used between 1937–58 in connection with the manufacture of products having commercial value. These 25 licenses were held by 16 companies. The sales value reported by these companies for the years 1946–58 was in excess of $8 million. By 1958, however, only 6 of the 16 companies were still making use of these inventions. But these six companies were responsible for about 75 percent of the $8 million in sales.

The remaining 127 licenses were not believed to have commercial value. Although many companies in seeking a license expected that it would have a commercial value, they later determined that such was not the situation. Among the reasons most frequently given for nonuse were the following: Overcrowded markets; the likely market being too small to indicate profitable production; the high cost of marketing the product; and a desire to watch economic developments before undertaking production.

The following table indicates the Government-owned patents with respect to which licenses were granted and which are known to have enjoyed commercial use during the years 1946–58:

Number of patent	Department which issued license	Date of issuance	Subject matter of patent
2,175,743	Army	Sept. 31, 1956	Priming system for internal combustion engines.
2,283,185	do	do	Diesel engine starter.
2,284,640	do	do	Breech mechanism for power generating units.
2,299,464	do	do	Power generating unit.
2,390,848	do	Jan. 3, 1946 May 31, 1946	Rodenticides.
2,411,338	do	May 6, 1949	Wave guides.
2,448,993	Navy	Sept. 1, 1951	Method of producing magnesium base alloys.
2,451,893	Army	Oct. 30, 1950	Stagger tuned amplifiers.
2,498,165	do	Apr. 19, 1958	Processes for producing bacitracin.
2,480,205	do	Oct. 30, 1950	Stagger damped tuned amplifiers.
2,504,875	do	Mar. 14, 1951	Methods for producing 4-hydroxyquinolines.
2,504,895	do	do	Methods for preparation of intermediate compounds suited for conversion into nuclear substituted heterocyclic compound.
2,575,360	do	Mar. 11, 1952 Apr. 23, 1952	Magnetic fluid torque and force transmitting device.
2,606,107	do	Oct. 10, 1952	Phase shifting network.
2,606,966	Navy	Dec. 31, 1954	Incendiary compositions and methods of making same.
2,636,060	Army	Feb. 9, 1955	Primary battery and method of making same.
2,639,306	do	do	Pile battery fabrication.
2,646,585	do	Apr. 6, 1953	Washing apparatus.
[1] 23,883	do	Feb. 9, 1955	Cupuous chloride electrode.

[1] Reissue.

III. Agency Viewpoint

A. Judgment as to effectiveness of present policy

It is the view of the Department of Defense that in the areas of its responsibility its policy of generally acquiring for the Government a royalty-free license, instead of title, to an invention conceived or first actually reduced to practice under its research and development contracts, is in the best interest of the United States. In the Department's view, this policy most nearly reflects the normal operation of the patent system and deliberately takes advantage of the incentives provided by that system to encourage inventors and innovators to bring ideas of potential military usefulness to the Department and also to encourage commercial organizations to devote their best background experience and most promising new ideas and approaches to defense work, in each case without jeopardizing any commercial value to them of such ideas or experience. In addition, the Department feels the license policy provides the patent protection which may frequently be necessary to assure the large additional investment and effort required to develop an invention into a form suitable for commercial use. The Department states that the license policy, which has been pursued since World War II, has proven itself successful in tapping the resources of American industry for rapid technological advance for national defense purposes.

However, the Department does not oppose taking title to contractor's inventions in particular circumstances where some special purpose of the Government may be served thereby. The recent amendment to the ASPR requires contracting officers to consider each proposed research and development contract in this light and recommend

to higher authority deviations from the general policy in appropriate circumstances. It is believed by the Department that this approach will strike a fair balance between the interest of the contractors and the needs of the Government.

The Department has opposed for many years any requirement for taking greater rights from contractors as a general policy. It is believed that substantial change from the present policy would seriously disrupt and impede the successful prosecution of the Department's research and development program. The Department states that the kind of scientific and technological talent, experience, and facilties which the Department's programs require cannot be found solely, or even preponderantly, in organizations willing to perform contracts under which they would not be able to patent their ideas.

It is believed by the services that Executive Order 10096 has dampened the incentive to invent among Federal employees. Although in practice the order has been so administered as to achieve results which are harmonious with the results which could be reached through application of judicial standards as promulgated in the *Dubilier* and other cases, it is the view of the services that the actual language of the order discourages invention by employees.

B. RECOMMENDATIONS AS TO FUTURE POLICY

The Department of Defense does not recommend any legislation or change in policy with respect to patent rights in inventions resulting from research and development contracts.

It is recommended that Executive Order 10096 be rescinded and superseded by the enactment of legislation which would enact into law the judicial standards which have been followed for the past century in determining Federal-employee invention rights.

APPENDIXES

APPENDIX A

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SECTION IX—PATENTS, DATA, AND COPYRIGHTS

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SECTION IX

PATENTS, DATA, AND COPYRIGHTS

9-000 Scope of Section. This Section sets forth policies, instructions, and contract clauses pertaining to patents, data, and copyrights in connection with the procurement of supplies and services.

Part 1—Patents

9-100 Scope of Part. This Part prescribes contract clauses and instructions which define and implement the policy of the Department of Defense with respect to—

(i) Inventions relating to experimental, developmental, or research work performed under Government contracts.

(ii) Patent infringement liability resulting from work performed under Government contracts.

(iii) Patent royalties payable in connection with the performance of Government contracts.

(iv) Security requirements covering patent applications containing classified subject matter filed by contractors.

9-101 Reserved.

9-102 Authorization and Consent.

(a) Under 28 U.S.C. 1498, any suit for infringement of a United States patent based on the manufacture or use by or for the United States of an invention described in and covered by a patent of the United States by a contractor or by a subcontractor (including lower-tier subcontractors) can be maintained only against the Government in the Court of Claims, and not against the contractor or subcontractor, in those cases where the Government has authorized or consented to the manufacture or use of the patented invention. Accordingly, in order that work by a contractor or subcontractor under a Government contract may not be enjoined by reason of patent infringement, authorization and consent may be given as herein provided. The liability of the Government for damages in any such suit against it may, however, ultimately be borne by the contractor or subcontractor in accordance with the terms of any patent indemnity clause also included in the contract, and an authorization and consent clause does not detract from any patent indemnification commitment by the contractor or subcontractor. Therefore, both a patent indemnity clause and an authorization and consent clause may be included in the same contract.

(b) An authorization and consent clause shall not be used in contracts where both complete performance and delivery are to be outside the United States, its possessions, or Puerto Rico.

9-102.1 *Authorization and Consent in Contracts for Supplies.* The contract clause set forth below may be included in all contracts for supplies (including construction work), except that it shall not be used:

(i) when prohibited by 9-102(b); or

(ii) in contracts exclusively for experimental, developmental, or research work which are subject to the provisions of 9-102.2.

PATENTS, DATA, AND COPYRIGHTS

AUTHORIZATION AND CONSENT (JAN. 1961)

The Government hereby gives its authorization and consent (without prejudice to its rights of indemnification, if such rights are provided for in this contract) for all use and manufacture, in the performance of this contract or any part hereof or any amendment hereto or any subcontract hereunder (including any lower-tier subcontract), of any invention described in and covered by a patent of the United States (i) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract, or (ii) utilized in the machinery, tools, or methods the use of which necessarily results from compliance by the Contractor or the using subcontractor with (a) specifications or written provisions now or hereafter forming a part of this contract, or (b) specific written instructions given by the Contracting Officer directing the manner of performance. The Contractor's entire liability to the Government for infringement of a patent of the United States shall be determined solely by the provisions of the indemnity clause, if any, included in the contract and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted.

9–102.2 *Authorization and Consent in Contracts for Research or Development.* Greater latitude in the use of patented inventions is to be allowed in a contract for experimental, developmental, or research work than in a contract for supplies. Unless prohibited by 9–102(b), the clause set forth below shall be included in all contracts calling exclusively for experimental, developmental, or research work, and may be included in contracts calling for both supplies and experimental, developmental, or research work. If the clause set forth below is included in a contract, the clause in 9–102.1 shall not be included.

AUTHORIZATION AND CONSENT (JAN. 1961)

The Government hereby gives its authorization and consent for all use and manufacture of any invention described in and covered by a patent of the United States in the performance of this contract or any part hereof or any amendment hereto or any subcontract hereunder (including any lower-tier subcontract).

9–103 Patent Indemnification of Government by Contractor. In order that the Government may be reimbursed for liability for patent infringement arising out of or resulting from the performance of construction contracts or contracts for supplies which normally are or have been sold or offered for sale to the public in the commercial open market, or which are the same as such supplies with a relatively minor modification thereof, clauses providing for indemnification of the Government are to be included in such contracts in accordance with the instructions preceding the clauses set forth below. A patent indemnity clause shall not be used in contracts under the following circumstances:

[Next page is 902.1]

(i) where the contract is for supplies which clearly are not or have not been sold or offered for sale to the public in the commercial open market. However, even in the foregoing instance, a patent indemnity clause may be included where (A) in the case of contracts to be awarded by formal advertising it is desired to obtain an indemnity as to components and spare parts so sold or offered for sale, in which case the clause in 9-103.2 may be used; or (B) in the case of contracts to be awarded either by formal advertising or negotiation, a patent owner contends that the prospective procurement would infringe his patent and the low bidder or offeror is willing to indemnify the Government as to such patent without increase in price on the basis that the patent is invalid or not infringed, or for other good reasons (see 2-407.8); or

[Next page is 903]

(ii) where both performance and delivery are to be outside the United States, its possessions, or Puerto Rico, unless the contract indicates that the supplies are ultimately to be shipped into the United States, its possessions, or Puerto Rico, in which case the instructions of 9-103.1, 9-103.2, or 9-103.3 are applicable; or

(iii) where the contract is for an amount of $5,000 or less, except that, as a matter of administrative convenience, the clause need not be deleted where it is a part of a standard form being used for contracts of $5,000 or less, since it is self-deleting as to such contracts.

9-103.1 *Patent Indemnification in Formally Advertised Contracts—Commercial Status Predetermined.*

(a) Except as prohibited by 9-103, the clause set forth below is appropriate in formally advertised construction contracts and shall be included in formally advertised contracts for supplies when it has been determined in advance of issuing the invitation for bids that the supplies (or such supplies apart from relatively minor modifications to be made thereto) normally are or have been sold or offered for sale by any supplier to the public in the commercial open market.

PATENT INDEMNITY (PREDETERMINED) (JAN. 1955)

If the amount of this contract is in excess of $5,000, the Contractor shall indemnify the Government and its officers, agents, and employees against liability, including costs, for infringement of any United States letters patent (except letters patent issued upon an application which is now or may hereafter be kept secret or otherwise withheld from issue by order of the Government) arising out of the manufacture or delivery of supplies or out of construction, alteration, modification, or repair of real property (hereinafter referred to as "construction work") under this contract, or out of the use or disposal by or for the account of the Government of such supplies or construction work. The foregoing indemnity shall not apply unless the Contractor shall have been informed as soon as practicable by the Government of the suit or action alleging such infringement, and shall have been given such opportunity as is afforded by applicable laws, rules, or regulations to participate in the defense thereof; and further, such indemnity shall not apply if: (i) the infringement results from compliance with specific written instructions of the Contracting Officer directing a change in the supplies to be delivered or in the materials or equipment to be used, or directing a manner of performance of the contract not normally used by the Contractor; or (ii) the infringement results from the addition to, or change in, the supplies furnished or construction work performed, which addition or change was made subsequent to delivery or performance by the Contractor; or (iii) the claimed infringment is settled without the consent of the Contractor, unless required by final decree of a court of competent jurisdiction.

(b) Certain supply contracts call only in part for items which normally are or have been sold or offered for sale by any supplier to the public in the commercial open market, or such items with relatively minor modifications. For the purpose of excluding from patent indemnification such specific items as normally are not or have not been sold or offered for sale by any supplier to the public in the commercial open market, the following sentence may be added to the end of the clause set forth in (a) above:

"The foregoing shall not apply to the following contract items:

(List the items to be excluded)"

9–103.2 *Patent Indemnification in Formally Advertised Contracts—Commercial Status Not Predetermined.* Except as prohibited by 9–103, the clause set forth below is appropriate in (i) formally advertised construction contracts and (ii) formally advertised contracts for supplies or component parts thereof when it is not determined in advance of issuing the invitation for bids that such supplies or component parts (or such supplies or component parts apart from relatively minor modifications to be made thereto) normally are or have been sold or offered for sale by any supplier to the public in the commercial open market.

PATENT INDEMNITY (NOT PREDETERMINED) (JAN. 1955)

If the amount of this contract is in excess of $5,000, the Contractor shall indemnify the Government and its officers, agents, and employees against liability, including costs, for infringement of any United States letters patent (except letters patents issued upon an application which is now or may hereafter be kept secret or otherwise withheld from issue by order of the Government) arising out of the manufacture or delivery of supplies or component parts thereof, or out of construction, alteration, modification, or repair of real property (hereinafter referred to as "construction work") under this contract, or out of the use or disposal by or for the account of the Government, of such supplies, construction work, or component parts thereof, which supplies or component parts either normally are or have been sold or offered for sale to, and which construction work normally is of a type performed for, the public in the commercial open market by any supplier on or before the date set for opening of bids, or are such supplies, construction work, or component parts thereof, with relatively minor modifications made thereto. The foregoing indemnity shall not apply unless the Contractor shall have been informed as soon as practicable by the Government of the suit or action alleging such infringement, and shall have been given such opportunity as is afforded by applicable laws, rules, or regulations to participate in the defense thereof: and further, such indemnity shall not apply if: (i) the infringement results from compliance with specific written instructions of the Contracting Officer directing a change in the supplies to be delivered or in the materials or equipment to be used, or directing a manner of performance of the contract not normally used by the Contractor; or (ii) the infringement results from addition to, or change in, such supplies or components furnished or construction work performed which addition or change was made subsequent to delivery or performance by the Contractor; or (iii) the claimed infringement is settled without the consent of the Contractor, unless required by final decree of a court of competent jurisdiction.

9–103.3 *Patent Indemnification in Negotiated Contracts.* A patent indemnity clause is not required to be included in negotiated contracts, but may be included in negotiated construction contracts and, except as otherwise authorized in 9–103 (i) (B), may be included in negotiated contracts for supplies only where such supplies normally are or have been sold or offered for sale *by the contractor* to the public in the commercial open market, or are such supplies with relatively minor modifications made thereto. Ordinarily, it should be quite feasible for the contracting officer to determine, in consultation with the contractor, whether the supplies being purchased normally are on sale or have been sold or offered for sale *by the contractor* to the public in the commercial open market.

(a) Subject to the foregoing and to the prohibitions in 9–103, the clause set forth in 9–103.1 (a) is approved for use in negotiated contracts for construction work or supplies.

(b) Certain supply contracts call only in part for items which normally are or have been sold or offered for sale *by the contractor* to the public in the

commercial open market, or such items with relatively minor modifications. For the purpose of excluding from patent indemnification such specific items as normally are not or have not been sold or offered for sale *by the contractor* to the public in the commercial open market, the following sentence may be added to the end of the clause approved for use in (a) above:

"The foregoing shall not apply to the following contract items:
(List the items to be excluded)"

9–103.4 *Waiver of Indemnity by the Government.* In the event that it is desired to exempt one or more specified United States patents from the indemnification provisions of the preceding clauses, authority shall first be obtained from the Secretary concerned or his authorized representative, and the following clause shall be included in the contract, in addition to the patent indemnity clause:

WAIVER OF INDEMNITY (JAN. 1955)

Any provision of this contract to the contrary notwithstanding, the Government hereby authorizes and consents to the use and manufacture, solely in the performance of this contract, of any invention covered by the United States patents identified and listed below, and waives indemnification by the Contractor with respect to such patents:
(Identify the patents by number or by other means if more appropriate)

9–104 Notice and Assistance. The Government should be notified by the contractor of all claims of infringement in connection with the performance of a Government contract which come to the contractor's attention. The contractor should also assist the Government, to the extent of evidence and information in the possession of the contractor, in connection with any suit against the Government, or any claim against the Government made before suit has been instituted, on account of any alleged patent infringement arising out of or resulting from the performance of the contract. Accordingly, the clause set forth below shall be included in all contracts in excess of $10,000 for supplies, construction, or experimental, developmental, or research work; except where Standard Form 32 is prescribed for use (in which case the clause may in the discretion of the contracting officer be used in lieu of that included in Standard Form 32); *provided*, that the clause set forth below shall not be included in contracts—

(i) where both performance and delivery are to be outside the United States, its possessions, or Puerto Rico, unless the contract indicates that the supplies are ultimately to be shipped into the United States, its possessions, or Puerto Rico; or,

(ii) of $10,000 or less, except that as a matter of administrative convenience, the clause need not be deleted when it is a part of a standard form being used for such contracts, since it is self-deleting:

NOTICE AND ASSISTANCE REGARDING PATENT INFRINGEMENT (OCT. 1958)

The provisions of this clause shall be applicable only if the amount of this contract exceeds $10,000.

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent infringement based on the performance of this contract of which the Contractor has knowledge.

[Contract clause continued on next page]

(b) In the event of any suit against the Government, or any claim against the Government made before suit has been instituted, on account of any alleged patent infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed hereunder, the Contractor shall furnish to the Government, upon request, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except in those cases in which the Contractor has agreed to indemnify the Government against the claim being asserted.

9–105 Processing of Infringement Claims. The Military Departments shall process claims for alleged unauthorized use of inventions in accordance with instructions of each respective Military Department.

9–106 Classified Contracts. Unauthorized disclosure of classified subject matter, whether in patent applications or resulting from the issuance of a patent, may be a violation of 18 U.S.C. 791 et seq. (Espionage and Censorship) and related statutes and may be contrary to the interests of national security. Accordingly, except as otherwise provided in 9–106.1, the following clause shall be included in every classified contract and in every unclassified contract which covers or is likely to cover classified subject matter:

FILING OF PATENT APPLICATIONS (JAN. 1955)

(a) Before filing or causing to be filed a patent application disclosing any subject matter of this contract, which subject matter is classified "Secret" or higher, the Contractor shall, citing the thirty (30) day provision below, transmit the proposed application to the Contracting Officer for determination whether, for reasons of national security, such application should be placed under an order of secrecy or sealed in accordance with the provisions of 35 U.S. 181–188 or the issuance of a patent should be otherwise delayed under pertinent statutes or regulations; and the Contractor shall observe any instructions of the Contracting Officer with respect to the manner of delivery of the patent application to the U.S. Patent Office for filing, but the Contractor shall not be denied the right to file such patent application. If the Contracting Officer shall not have given any such instructions within thirty (30) days from the date of mailing or other transmittal of the proposed application, the Contractor may file the application.

(b) The Contractor shall furnish to the Contracting Officer, at the time of or prior to the time when the Contractor files or causes to be filed a patent application disclosing any subject matter of this contract, which subject matter is classified "Confidential," a copy of such application for determination whether, for reasons of national security, such application should be placed under an order of secrecy or the issuance of a patent should be otherwise delayed under pertinent statutes or regulations.

(c) In filing any patent application coming within the scope of this clause, the Contractor shall observe all applicable security regulations covering the transmission of classified subject matter.

9–106.1 *Classified Contracts To Be Performed Outside the United States.* The following clause shall be included in classified contracts and in every unclassified contract which covers or is likely to cover classified subject matter where the work is to be performed outside the United States, its possessions, or Puerto Rico, regardless of the place of delivery:

FILING OF PATENT APPLICATIONS (FOREIGN) (JAN. 1958)

While and so long as any subject matter of this contract is classified for reasons of security, the Contractor shall not file, or cause to be filed, in any country, an application or registration for a patent containing any of said subject matter without first obtaining written approval of the Contracting Officer.

PATENTS

9–107 Patent Rights.

9–107.1 *General.*

(a) *The License Policy.* In framing a policy on the division of property rights in inventions and discoveries resulting from research work performed under contract for the Department of Defense, the Department recognizes that the American patent system was established as an incentive to invention, disclosure, and commercial exploitation of new ideas. In order to take advantage of the incentives implicit in the patent system and to secure American industry's unreserved participation in military research and development under both contracts and subcontracts, while acquiring the rights necessary for the Government freely to carry out its programs, the Department of Defense generally obtains on behalf of the Government a comprehensive license of free use but does not require that full title to the new inventions be assigned to the Government.

(b) *The Comprehensive License.* The comprehensive license, which is irrevocable, nonexclusive, nontransferable, and world-wide in scope, permits, royalty-free, any use of the inventions by the Government by itself, any use by a Government contractor or subcontractor in connection with the performance of a Government contract, and any use by anyone in connection with projects funded by the Government, including the Mutual Security Program. The inventions covered are those which are conceived, or first actually reduced to practice, in the course of performing any contract or modification thereof, having experimental, developmental, or research work as one of its purposes, or in the course of performing such work on the understanding in writing that a contract would be awarded.

(c) *Government Acquisition of Title.* While it is the general policy not to acquire more than the comprehensive license described above, the Department of Defense recognizes that there may be some situations in which it will be desirable in the public interest to obtain full title to the inventions made under the contracts. In a new technological field, for example, where there is no significant nongovernmental experience to build upon, and inventions which may be made under the contract would be likely to dominate the field or be of critical significance in it, it may be desirable for the Government to hold title to such inventions. Again, where the services of the contractor are largely those of coordinating and directing the work of others, the Government may wish to acquire title to prevent the possibility or appearance of private advantage as to the ideas of others. Likewise, the Government may obtain title in recognition of the overriding public interest in inventions in fields directly relating to the health or safety of the public, if their availability for public use will not depend on patent incentives.

(d) *Contracting Officer's Duties.* When a contract or modification thereof having experimental, developmental, or research work as one of its purposes is proposed, the contracting officer, in consultation with his technical and patent advisors, shall consider whether the contemplated project should entail Government acquisition of title in keeping with (c) above or similar considerations. If in his opinion it should, he shall refer the matter, with supporting information (including identification of any inventions on which patent

applications are on file and which are expected to be actually reduced to practice under the proposed project), to higher authority, in accordance with the deviation procedures of 1–109. If a deviation is authorized, the contracting officer shall insert in the contract the clause specified in 9–107.2(c). In all cases not involving the acquisition of title in keeping with (c) above the contracting officer shall include in the contract the clause specified in 9–107.2(b), except as provided in 9–107.3, concerning foreign contracts (unless the clause specified in 9–107.2(c) has been authorized); 9–107.4, concerning contracts relating to Atomic Energy; 9–107.5, concerning contracts relating to Civil Defense; and 9–107.7, concerning contracts placed for the National Aeronautics and Space Administration. In cases falling within these exceptions, the contracting officer shall follow the instructions stated in the applicable paragraph.

(e) *Other Procurement of Patent Rights.* Except as provided in this 9–107, patent rights shall not be requested in the negotiation of contracts other than contracts where the primary item of procurement is a license under, or an assignment of, a patent. Such procurements are made to carry out the policy of the Department of Defense to pay a reasonable compensation for the use of a valid patent enforceable against the Government. The questions of infringement, validity, and enforceability of the patent shall be determined by personnel having cognizance of patent matters for the Department concerned.

9–107.2 *Patent Rights—Domestic Contracts.*

(a) *Exclusion of Inventions.* Upon request of the contractor, the contracting officer shall carefully consider and may exclude from the grant in the Patent Rights clause any invention which has not been actually reduced to practice, if it is covered by a United States patent issued or application for patent filed by or on behalf of the contractor prior to the award of a contract when he finds one or more of the following circumstances to be established:

(i) the contractor has expended sums in developing the invention (as represented by research and development costs and expenses for preparing and prosecuting the patent application) which are relatively large in comparison to the amount of the proposed contract or such portion of the proposed contract amount as can be allocated in advance for the development of such an invention (in determining the sums expended by the contractor there shall be included only amounts which can be allocated to the invention which is to be excluded; such sums shall not include the entire cost of a research department or program which cannot be allocated as above provided);

(ii) the practicability of such an invention has been established as by engineering design;

(iii) the invention covers a basic material and it is not the purpose of the contract to develop such material; or

(iv) the invention is useful only for military purposes and the contractor does not have facilities for furnishing the item to the Government in production quantities.

Any inventions to be excluded from the grant by reason of the foregoing circumstances shall be specifically identified and listed in the contract schedule.

(b) *Contract Clause (License).* The clause set forth below shall be included in every contract having as one of its purposes experimental, developmental, or research work which is to be performed within the United States, its possessions, or Puerto Rico, unless the clause set forth in 9-107.2(c) has been authorized in accordance with 9-107.1(d), or except as provided in 9-107.7 with respect to contracts on behalf of the National Aeronautics and Space Administration. See 16-809 for an approved form for optional use by contractors in reporting information required by paragraphs (c)(ii), (c)(iii), and (h) of the clause. In the administration of paragraph (e) of the clause, a request for conveyance of foreign rights to the Government is not required when the contractor does not file an application for patent in a foreign country under the conditions provided in that paragraph, unless the Government intends to apply for such patent.

PATENT RIGHTS (LICENSE) (JAN. 1961)

(a) As used in this clause, the following terms shall have the meanings set forth below:

(i) The term "Subject Invention" means any invention, improvement, or discovery (whether or not patentable) conceived or first actually reduced to practice either—

(A) in the performance of the experimental, developmental, or research work called for or required under this contract; or

(B) in the performance of any experimental, developmental, or research work relating to the subject matter of this contract which was done upon an understanding in writing that a contract would be awarded; *provided*, that the term "Subject Invention" shall not include any invention which is specifically identified and listed in the Schedule for the purpose of excluding it from the license granted by this clause.

(ii) The term "Technical Personnel" means any person employed by or working under contract with the Contractor (other than a subcontractor whose responsibilities with respect to rights accruing to the Government in inventions arising under subcontracts are set forth in (g), (h), and (i) below) who, by reason of the nature of his duties in connection with the performance of this contract, would reasonably be expected to make inventions.

(iii) The terms "subcontract" and "subcontractor" mean any subcontract or subcontractor of the Contractor, and any lower-tier subcontract or subcontractor under this contract.

(b) (1) The Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, nontransferable, and royalty-free license to practice, and cause to be practiced by or for the United States Government, throughout the world, each Subject Invention in the manufacture, use, and disposition according to law, of any article or material, and in the use of any method. Such license includes the practice of Subject Invention in the manufacture, use, and disposition of any article or material, in the use of any method, or in the performance of any service acquired by or for the Government or with funds derived through the Mutual Security Program of the Government or otherwise through the Government. No license granted herein shall convey any right to the Government to manufacture, have manufactured, or use any Subject Invention for the purpose of providing services or supplies to the general public in competition with the Contractor or the Contractor's commercial licensees in the licensed fields; but *provided*, however, that the restriction of this sentence shall not be applicable in respect to any services or supplies which the Government has heretofore or may hereafter provide as a governmental function pertaining to the general public health, safety, or welfare.

(2) With respect to:

(i) any Subject Invention made by other than Technical Personnel;

[Contract clause continued on next page]

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(ii) any Subject Invention conceived prior to, but first actually reduced to practice in the course of, any of the experimental, developmental, or research work specified in (a)(i) above; and

(iii) the practice of any Subject Invention in foreign countries;

the obligation of the Contractor to grant a license as provided in (b)(1) above, to convey title as provided in (d)(ii)(B) or (d)(iv) below, and to convey foreign rights as provided in (c) below, shall be limited to the extent of the Contractor's right to grant the same without incurring any obligation to pay royalties or other compensation to others solely on account of said grant. Nothing contained in this Patent Rights clause shall be deemed to grant any license under any invention other than a Subject Invention.

(c) The Contractor shall furnish to the Contracting Officer the following information and reports concerning Subject Inventions which reasonably appear to be patentable:

(i) a written disclosure promptly after conception or first actual reduction to practice of each such Invention together with a written statement specifying whether or not a United States patent application claiming the Invention has been or will be filed by or on behalf of the Contractor;

(ii) interim reports at least every twelve months, commencing with the date of this contract, each listing all such Inventions conceived or first actually reduced to practice more than three months prior to the date of the report, and not listed on a prior interim report, or certifying that there are no such unreported Inventions; and

(iii) prior to final settlement of this contract, a final report listing all such Inventions including all those previously listed in interim reports.

(d) In connection with each Subject Invention referred to in (c)(i) above, the Contractor shall do the following:

(i) if the Contractor specifies that a United States patent application claiming such Invention will be filed, the Contractor shall file or cause to be filed such application in due form and time; however, if the Contractor, after having specified that such an application would be filed, decides not to file or cause to be filed said application, the Contractor shall so notify the Contracting Officer at the earliest practicable date and in any event not later than eight months after first publication, public use or sale.

(ii) if the Contractor specifies that a United States patent application claiming such Invention has not been filed and will not be filed (or having specified that such an application will be filed thereafter notifies the Contracting Officer to the contrary), the Contractor shall:

(A) inform the Contracting Officer in writing at the earliest practicable date of any publication of such Invention made by or known to the Contractor or, where applicable, of any contemplated publication by the Contractor, stating the date and identity of such publication or contemplated publication; and

(B) convey to the Government the Contractor's entire right, title, and interest in such Invention by delivering to the Contracting Officer upon written request such duly executed instruments (prepared by the Government) of assignment and application, and such other papers as are deemed necessary to vest in the Government the Contractor's right, title, and interest aforesaid, and the right to apply for and prosecute patent applications covering such Invention throughout the world, subject, however, to the rights of the Contractor in foreign applications as provided in (e) below, and subject further to the reservation of a nonexclusive and royalty-free license to the Contractor (and to his existing and future associated and affiliated companies, if any, within the corporate structure of which the Contractor is a part) which license shall be assignable to the successor of that part of the Contractor's business to which such Invention pertains;

(iii) the Contractor shall furnish promptly to the Contracting Officer on request an irrevocable power of attorney to inspect and make copies of each United

[Contract clause continued on next page]

States patent application filed by or on behalf of the Contractor covering any such Invention;

(iv) in the event the Contractor, or those other than the Government deriving rights from the Contractor, elects not to continue prosecution of any such United States patent application filed by or on behalf of the Contractor, the Contractor shall so notify the Contracting Officer not less than sixty days before the expiration of the response period and, upon written request, deliver to the Contracting Officer such duly executed instruments (prepared by the Government) as are deemed necessary to vest in the Government the Contractor's entire right, title, and interest in such Invention and the application, subject to the reservation as specified in (d)(ii) above; and

(v) the Contractor shall deliver to the Contracting Officer duly executed instruments fully confirmatory of any license rights herein agreed to be granted to the Government.

(e) The Contractor, or those other than the Government deriving rights from the Contractor, shall, as between the parties hereto, have the exclusive right to file applications on Subject Inventions in each foreign country within:

(i) nine months from the date a corresponding United States application is filed;

(ii) six months from the date permission is granted to file foreign applications where such filing had been prohibited for security reasons; or

(iii) such longer period as may be approved by the Contracting Officer.

The Contractor shall, upon written request of the Contracting Officer convey to the Government the Contractor's entire right, title, and interest in each Subject Invention in each foreign country in which an application has not been filed within the time above specified, subject to the reservation of a nonexclusive and royalty-free license to the Contractor together with the right of the Contractor to grant sublicenses, which license and right shall be assignable to the successor of that part of the Contractor's business to which the Subject Invention pertains.

(f) If the Contractor fails to deliver to the Contracting Officer the interim reports required by (c)(ii) above, or fails to furnish the written disclosures for all Subject Inventions required by (c)(i) above shown to be due in accordance with any interim report delivered under (c)(ii) or otherwise known to be unreported, there shall be withheld from payment until the Contractor shall have corrected such failures either ten percent (10%) of the amount of this contract, as from time to time amended, or five thousand dollars ($5,000), whichever is less. After payment of eighty percent (80%) of the amount of this contract, as from time to time amended, payment shall be withheld until a reserve of either ten percent (10%) of such amount, or five thousand dollars ($5,000), whichever is less shall have been set aside, such reserve or balance thereof to be retained until the Contractor shall have furnished to the Contracting Officer:

(i) the final report required by (c)(iii) above;

(ii) written disclosures for all Subject Inventions required by (c)(i) above which are shown to be due in accordance with interim reports delivered under (c)(ii) above, or in accordance with such final reports, or are otherwise known to be unreported; and

(iii) the information as to any subcontractor required by (h) below.

The maximum amount which may be withheld under this paragraph (f) shall not exceed ten percent (10%) of the amount of this contract or five thousand dollars ($5,000), whichever is less, and no amount shall be withheld under this paragraph (f) when the amount specified by this paragraph (f) is being withheld under other provisions of this contract. The withholding of any amount or subsequent payment thereof to the Contractor shall not be construed as a waiver of any rights accruing to the Government under this contract. This paragraph (f) shall not be construed as requiring the Contractor to withhold any amounts from a subcontractor to enforce compliance with the patent provision of a subcontract.

(g) The Contractor shall exert all reasonable effort in negotiating for the inclusion of a patent rights clause containing all the provisions of this Patent Rights clause

[Contract clause continued on next page]

except provisions (f) and (i) in any subcontract hereunder of three thousand dollars ($3,000) or more having experimental, developmental, or research work as one of its purposes. In the event of refusal by a subcontractor to accept such a patent rights clause, the Contractor shall not proceed with the subcontract without written authorization of the Contracting Officer or unless there has been a waiver of the requirement as hereinafter provided. The Contractor, if unable to comply with the requirement that such a patent rights clause be included in a subcontract after exerting all reasonable effort to do so, may submit to the Contracting Officer a written request for waiver or modification of such requirement. If, within thirty-five (35) days after the receipt of such request, the Contracting Officer does not mail or otherwise furnish the Contractor written denial of such request or notification that the Government requests the Contractor's cooperation with the Government, which the Contractor agrees to provide, in negotiating with the subcontractor for the acceptance of a suitable patent rights clause, the requirement shall be deemed to have been waived by the Contracting Officer as to all patent rights provisions with respect to Subject Inventions, except such provisions, if any, relating to the production or utilization of special nuclear material or atomic energy. Such request shall specifically state that the Contractor has used all reasonable effort to comply with said requirement and shall cite the waiver provision herein above set forth. The Contractor is not required, when negotiating with a subcontractor, to obtain in behalf of the Government any rights in Subject Inventions other than as provided herein. However, the Contractor is not precluded from separately negotiating with a subcontractor for rights in Subject Inventions for the Contractor's own behalf, but any costs so incurred shall not be considered as an allowable charge or cost under this contract. Reports, instruments, and other information required to be furnished by a subcontractor to the Contracting Officer under the provisions of such a patent rights clause in a subcontract hereunder may, upon mutual consent of the Contractor and the subcontractor (or by direction of the Contracting Officer) be furnished to the Contractor for transmission to the Contracting Officer.

(h) The Contractor shall, at the earliest practicable date, notify the Contracting Officer in writing of any subcontract containing one or more patent rights clauses; furnish the Contracting Officer a copy of each of such clauses; and notify the Contracting Officer when such subcontract is completed. It is understood that with respect to any subcontract clause granting rights to the Government in Subject Inventions, the Government is a third party beneficiary; and the Contractor hereby assigns to the Government all the rights that the Contractor would have to enforce the subcontractor's obligations for the benefit of the Government with respect to Subject Inventions. If there are no subcontracts containing patent rights clauses, a negative report is required. The Contractor shall not be obligated to enforce the agreements of any subcontractor hereunder relating to the obligations of the subcontractor to the Government in regard to Subject Inventions.

(i) When the Contractor shows that he has been delayed in the performance of this contract by reason of the Contractor's inability to obtain, in accordance with the requirements of (g) above, the prescribed or other authorized suitable patent rights clause from a qualified subcontractor for any item or service required under this contract for which the Contractor himself does not have available facilities or qualified personnel, the Contractor's delivery dates shall be extended for a period of time equal to the duration of such delay. Upon request of the Contractor, the Contracting Officer shall determine to what extent, if any, an additional extension of the delivery dates and increase in contract prices based upon additional costs incurred by such delay are proper under the circumstances; and the contract shall be modified accordingly.

(j) The Contractor recognizes that the Government, or a foreign government with funds derived through the Mutual Security Program or otherwise through the United States Government, may contract for property or services with respect to which the vendor may be liable to the Contractor for royalties for the use of a Subject Invention on account of such a contract. The Contractor further recognizes that it is the policy of the Government not to pay in connection with its contracts, or to allow to be paid in

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connection with contracts made with funds derived through the Mutual Security Program or otherwise through the United States Government, charges for use of patents in which the Government holds a royalty-free license. In recognition of this policy, the Contractor agrees to participate in and make appropriate arrangements for the exclusion of such charges from such contracts or for the refund of amounts received by the Contractor with respect to any such charges not so excluded.

(c) *Contract Clause (Title).* The clause set forth below shall be included in contracts in which its use in place of the clause set forth in 9–107.2(b) has been authorized in accordance with 9–107.1(d). If it is so directed by higher authority, paragraph (c) of the clause set forth below, relating to subcontracts, may be replaced, or supplemented in regard to particular subcontracts, by provisions substantially similar to those provided in 9–107.2(b), or other provisions acquiring from the subcontractor for the benefit of the Government patent rights at least equivalent to those provided in 9–107.2(b). If paragraph (c) is not so replaced, and during the course of contract performance the contractor notifies the contracting officer that a subcontractor refuses to accept a clause containing the provisions of the clause set forth below, the contracting officer may, if he determines that Government acquisition of title under the particular subcontract is not essential for the purposes of the prime contract, authorize the contractor to insert in the particular subcontract, in lieu of the paragraph set forth below, provisions equivalent to those provided in 9–107.2(b). Optional paragraph (g) may be used if directed by higher authority to apply to specific inventions disclosed in a patent application filed prior to the award of the contract.

PATENT RIGHTS (TITLE) (JAN. 1961)

(a) The Contractor agrees to grant the Government all right, title and interest in and to any invention conceived or first actually reduced to practice either—

(i) in the performance of the experimental, developmental, or research work called for or required under this contract; or

(ii) in the performance of any experimental, developmental, or research work relating to the subject matter of this contract which was done upon an understanding in writing that a contract would be awarded;

by any employee of the Contractor who, by reason of the nature of his duties in connection with the performance of this contract, would reasonably be expected to make inventions.

(b) With respect to inventions referred to in (a) above, the Contractor shall furnish to the Contracting Officer the following information and reports:

(i) a written disclosure promptly after conception or first actual reduction to practice of each such invention;

(ii) interim reports at least every twelve months, commencing with the date of this contract, each listing all such inventions conceived or first actually reduced to practice more than three months prior to the date of the report, and not listed on a prior interim report, or certifying that there are no such unreported inventions;

(iii) prior to final settlement of this contract, a final report listing all such inventions including all those previously listed in interim reports; and

(iv) at the earliest practicable date, information concerning publication of each such invention made by or known to the Contractor or, where applicable, of any contemplated publication by the Contractor, stating the date and identity of such publication or contemplated publication.

(c) The Contractor shall, unless otherwise authorized by the Contracting Officer, include a patent rights clause containing all of the provisions of this Patent Rights

[Contract clause continued on next page]

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clause (including this paragraph (e)) in each subcontract hereunder of three thousand dollars ($3,000) or more having experimental, developmental, or research work as one of its purposes.

(d) The Contractor shall obtain the execution of and deliver to the Contracting Officer any documents relating to inventions referred to in (a) above as the Contracting Officer may require to enable the Government to file and prosecute patent applications therefor in any country.

(e) In the event that the Government determines not to file a patent application on any invention referred to in (a) above in any particular foreign country or fails to take such action (i) within six months of the filing of an application for United States patent on the invention, or (ii) within six months of the declassification of the invention if under a security classification, or (iii) within six months after disclosure of the invention to the Government pursuant to (b) (i) above, whichever is later, the Contracting Officer may authorize the Contractor to file a patent application in such foreign country and retain ownership thereof, subject to an irrevocable, nonexclusive, royalty-free license to the Government in any patent which may issue thereon in such foreign country, including the power to issue sublicenses for use in behalf of the Government and in furtherance of the foreign policies of the Government, including the right to grant nonexclusive, nontransferable, royalty-free licenses to United States citizens and to United States corporations when seventy-five percent (75%) or more of the voting interest is owned by United States citizens.

(f) If the Contractor fails to deliver to the Contracting Officer the interim reports required by (b) (ii) above, or fails to furnish the written disclosures for all inventions required by (b) (i) above shown to be due in accordance with any interim report delivered under (b) (ii) or otherwise known to be unreported, there shall be withheld from payment until the Contractor shall have corrected such failures either ten percent (10%) of the amount of this contract, as from time to time amended, or five thousand dollars ($5,000), whichever is less. After payment of eighty percent (80%) of the amount of this contract, as from time to time amended, payment shall be withheld until a reserve of either ten percent (10%) of such amount, or five thousand dollars ($5,000), whichever is less, shall have been set aside, such reserve or balance thereof to be retained until the Contractor shall have furnished to the Contracting Officer:

(i) the final report required by (b) (iii) above; and

(ii) written disclosures for all inventions required by (b) (i) above which are shown to be due in accordance with interim reports delivered under (b) (ii) above, or in accordance with such final reports, or are otherwise known to be unreported.

The maximum amount which may be withheld under this paragraph (f) shall not exceed ten percent (10%) of the amount of this contract or five thousand dollars ($5,000), whichever is less, and no amount shall be withheld under this paragraph (f) when the amount specified by this paragraph (f) is being withheld under other provisions of this contract. The withholding of any amount or subsequent payment thereof to the Contractor shall not be construed as a waiver of any rights accruing to the Government under this contract. This paragraph (f) shall not be construed as requiring the Contractor to withhold any amounts from a subcontractor to enforce compliance with the patent provisions of a subcontract.

(g) (1) Paragraph (a) of this Patent Rights clause shall not be applicable to the inventions covered in [*Insert serial numbers and filing dates of patent applications*], but the Contractor agrees to grant to the Government an irrevocable, nonexclusive, nontransferable, and royalty-free license to practice, and cause to be practiced by or for the United States Government, throughout the world, such inventions in the manufacture, use, and disposition according to law, of any article or material, and in the use of any method. Such license includes the practice of such inventions in the manufacture, use, and disposition of any article or material, in the use of any method, or in the performance of any service acquired by or for the Government or with funds derived through the

[Contract clause continued on next page]

Mutual Security Program of the Government or otherwise through the Government. No license granted in accordance with this paragraph (g) shall convey any right to the Government to manufacture, have manufactured, or use any such inventions for the purpose of providing services or supplies to the general public in competition with the Contractor or the Contractor's commercial licensees in the licensed field, but *provided*, however, that the restriction of this sentence shall not be applicable in respect to any services or supplies which the Government has heretofore or may hereafter provide as a governmental function pertaining to the general public health, safety, or welfare.

(2) The Contractor, or those other than the Government deriving rights from the Contractor, shall, as between the parties hereto, have the exclusive right to file applications on inventions identified in paragraph (g)(1) above in each foreign country within:

(i) nine months from the date a corresponding United States application is filed;

(ii) six months from the date permission is granted to file foreign applications where such filing had been prohibited for security reasons; or

(iii) such longer period as may be approved by the Contracting Officer.

The Contractor shall, upon written request of the Contracting Officer convey to the Government the Contractor's entire right, title, and interest in each such invention in each foreign country in which an application has not been filed within the time above specified, subject to the reservation of a nonexclusive and royalty-free license to the Contractor together with the right of the Contractor to grant sublicenses, which license and right shall be assignable to the successor of that part of the Contractor's business to which the invention pertains.

(3) The Contractor recognizes that the Government, or a foreign government with funds derived through the Mutual Security Program or otherwise through the United States Government, may contract for property or services with respect to which the vendor may be liable to the Contractor for royalties for the use of an invention identified in paragraph (g)(1) above on account of such a contract. The Contractor further recognizes that it is the policy of the Government not to pay in connection with its contracts, or to allow to be paid in connection with contracts made with funds derived through the Mutual Security Program or otherwise through the United States Government, charges for use of patents in which the Government holds a royalty-free license. In recognition of this policy, the Contractor agrees to participate in and make appropriate arrangements for the exclusion of such charges from such contracts or for the refund of amounts received by the Contractor with respect to any such charges not so excluded.

9–107.3 *Patent Rights—Foreign Contracts.* A patent rights clause shall be included in every contract having as one of its purposes experimental, developmental, or research work which is to be performed outside the United States, its possessions, or Puerto Rico. Except as provided in 9–107.7 with respect to contracts on behalf of the National Aeronautics and Space Administration, either the clause set forth below, or in lieu thereof, when authorized in accordance with 9–107.1(d), the clause set forth in 9–107.2(c), may be used; however, either clause may be replaced by any other clause tailored to meet requirements peculiar to foreign procurement *provided* the replacement clause incorporates the principles of the clause being replaced, except that the principles of paragraphs (c) and (d) of the clause below, or of paragraph (f) of the clause set forth in 9–107.2(c), as the case may be, may be omitted if, in the opinion of the contracting officer (on a case-by-case basis), the inclusion of withholding or other enforcement provisions is neither desirable nor necessary.

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PATENT RIGHTS (OCT. 1958)

(a) The Contractor agrees to and does hereby grant to the United States Government an irrevocable, nonexclusive, nontransferable, and royalty-free license to practice and cause to be practiced, by or for the United States Government, throughout the world, in the manufacture, use and disposition of any article or material, and in the use of any method, each invention (whether or not patentable) conceived or made in the performance of the experimental, developmental or research work called for or required under this contract.

(b) With respect to inventions referred to in (a) above, the Contractor:

(i) shall submit to the Contracting Officer, promptly after the conception or making of each such invention, a descriptive written disclosure thereof, and shall specify concurrently with the submission of each disclosure whether or not a patent application has been filed or will be filed by or on behalf of the Contractor and in which countries such application has been or will be filed;

(ii) shall upon request deliver to the Contracting Officer duly executed instruments fully confirmatory of the license rights granted in (a) above; but failure to execute such an instrument shall in no way detract from the license granted in (a) above;

(iii) shall inform the Contracting Officer in writing at the earliest practicable date of any publication thereof made by or known to the Contractor or, where applicable, of any contemplated publication by the Contractor, stating the date and identity of such publication or contemplated publication;

(iv) has, as between the parties hereto, the exclusive right except as hereinafter provided, to file a patent application thereon not later than nine (9) months after the date of submission to the Contracting Officer of the disclosure required in (i) above, or the date of first publication or public use or sale by or for the Contractor, whichever of such dates is earlier. Upon request of the Contractor, the nine-months period may be extended by the Contracting Officer. No patent application shall be filed by other than the United States Government, without the prior consent of the Contracting Officer, in any country and on any invention with respect to which the Contractor has either specified that he will not file an application or has not filed within the period set forth in this paragraph after having specified that he will file;

(v) shall inform the Contracting Officer immediately of the filing of a patent application in any country, identifying the country or countries in which such filing occurs and the date and serial number of the application, and shall furnish a copy of each such application;

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(vi) shall notify the Contracting Officer promptly of an election to abandon any patent application filed thereon, whether by discontinuing the prosecution of the application or otherwise, and shall not proceed with such abandonment for a period of sixty (60) days after the date of such notice unless otherwise authorized in writing by the Contracting Officer;

(vii) shall, upon written request of the Contracting Officer, execute and deliver an instrument conveying to the United States Government all right, title, and interest in each such invention in each country in which an application for patent either has not been filed within the time period specified in (iv) above or, if filed, is the subject of the notification referred to in (vi) above; *provided*, that such conveyance shall be subject to the reservation of a nonexclusive and royalty-free license to the Contractor in countries other than the Contractor's own country and the United States together with the right of the Contractor to grant sublicenses in such other countries;

(viii) shall enter into such arrangements, by contract or otherwise, with his employees and subcontractors as may be necessary to insure that the Contractor will be able to comply with this Patent Rights clause; and

(ix) shall, prior to final settlement of this contract, notify the Contracting Officer in writing in the event that no inventions are conceived or made in the performance of the experimental, developmental or research work called for or required under this contract.

(c) If the Contractor fails to deliver to the Contracting Officer the disclosures required by (b)(i) above, there shall be withheld from payment, until the Contractor shall have corrected such failure, either ten percent (10%) of the amount of this contract as from time to time amended or five thousand dollars ($5,000), whichever is less. After payment of eighty percent (80%) of the amount of this contract as from time to time amended, payment shall be withheld until a reserve of either ten percent (10%) of the amount of this contract or five thousand dollars ($5,000), whichever is less, shall have been set aside; such reserve or balance thereof to be retained until the Contractor shall have furnished to the Contracting Officer the written disclosures, information, notices, and instruments required by (b)(ii), (b)(iii), (b)(v), (b)(vi), (b)(vii) and (b)(ix), above.

(d) The maximum amount which may be withheld under (c) above shall not exceed ten percent (10%) of the amount of this contract or five thousand dollars ($5,000), whichever is less, and no amount shall be withheld under the provision of (c) above when the amount specified therein is being withheld under other provisions of this contract. The withholding of any amount or subsequent payment thereof to the Contractor shall not be construed as a waiver of any rights accruing to the United States Government under this contract.

9–107.4 *Contracts Relating to Atomic Energy.*

(a) Except as provided in (b) below, the following paragraph shall be inserted as a part of the Patent Rights clause set forth in 9–107.2 in all research or development contracts relating to atomic energy.

(j) With respect to any Subject Invention made by employees of the Contractor (except clerical and manual labor personnel who do not have access to technical data), and relating to the production or utilization of special nuclear material or atomic energy within the purview of the Atomic Energy Acts of 1946 (42 U.S.C. 1801–1819) and of 1954 (42 U.S.C. 2011–2296), the Contractor agrees:

(i) to furnish to the United States Atomic Energy Commission (hereinafter in this paragraph (j) referred to as "the Commission") through the Contracting Officer complete information regarding such Subject Invention, the Commission to have the sole and conclusive power to determine whether and where a patent application shall be filed, and to determine the disposition of the title to and rights under any such application or any patent that may issue thereon;

[Contract clause continued on next page]

(ii) to obtain the execution of and deliver to the Commission, all documents relating to each such Subject Invention and to do all things necessary or proper to carry out any determination of the Commission, made under (j)(i) above;

(iii) unless otherwise authorized in writing by the Commission to obtain patent agreements from all such employees to effectuate the purposes of this paragraph (j); and

(iv) unless otherwise authorized in writing by the Commission, to insert this paragraph (j) in all subcontracts.

No claim for pecuniary award or compensation under the provisions of the Atomic Energy Acts of 1946 and 1954 shall be asserted by the Contractor or his employees with respect to any Subject Invention covered by this paragraph. (DEC. 1955)

(b) Where the work to be performed or the material or equipment to be furnished by the contractor is of such character that any such Subject Inventions that may be made will probably (i) relate only incidentally (and not directly) to some phase of the basic research or development work which the Atomic Energy Commission conducts or sponsors, (ii) relate to a field or work in which the contractor has an established industrial and patent position, or (iii) result from routine development or production work by the contractor, a provision authorizing the contractor to retain license rights may be incorporated in the paragraph set forth in (a) above. Any such provision or any deviation from the paragraph set forth in (a) above, which the Military Department concerned proposes to authorize, shall be forwarded in accordance with Departmental procedures to the Atomic Energy Commission for recommendation and shall not be authorized except with the concurrence of the Atomic Energy Commission.

9–107.5 *Contracts Relating to Civil Defense.* In all contracts for experimental, developmental, or research work relating primarily to supplies or services intended for the general public for civil defense purposes, in lieu of paragraph (b)(1) of the Patent Rights clause prescribed in 9–107.2(b), the paragraph set forth below—

(i) shall be inserted in all such contracts entered into on behalf of and funded in whole by the Office of Defense and Civil Mobilization, unless such Office agrees to its exclusion; and

(ii) may be inserted in all such contracts other than those in (i) above.

(b)(1) The Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, nontransferable, and royalty-free license to practice, and cause to be practiced by or for the United States Government, throughout the world, each Subject Invention in the manufacture, use and disposition of any article or material, and in the use of any method; with the right in the Government to sublicense others to practice each Subject Invention in the manufacture, use and sale of any article or in the use of any method for the purpose of providing supplies or services to the general public in the furtherance of the nation's civil defense. (JAN. 1958)

9–107.6 *Patent License Rights Under Product Improvement Programs or Independent Research Programs.* Where a Military Department, under its established procedures, provides substantial financial support to a contractor's—

(i) specific product improvement program; or

(ii) specific projects within his independent research program;

the Military Department may obtain for the Government patent license rights to inventions, improvements, or discoveries conceived or first actually reduced to practice during or as a result of such support; *provided* the obtaining of such

[Contract clause continued on next page]

rights and the contractual arrangements for such rights are approved in the Army and the Navy by the Head of the Procuring Activity concerned, and in the Air Force by the Deputy Director/Procurement, Headquarters, Air Materiel Command or by the Director of Procurement, Headquarters, Air Research and Development Command.

9–107.7 *Contracts Placed for NASA.*

(a) *"Property Rights in Inventions" Clause.*

(1) The National Aeronautics and Space Administration (NASA) will from time to time request the Departments to perform work on behalf of NASA. Such requests will state whether or not the NASA "Property Rights in Inventions" clause is required in any contract let by the Departments on behalf of NASA for the performance of the work. The following rules explain the use of patent rights clauses in such contracts.

(i) If the request states that the NASA "Property Rights in Inventions" clause is required in any resulting contract and the work to be performed is not severable and is funded wholly or in part by NASA, then the NASA "Property Rights in Inventions" clause and no other patent rights clause shall be included in the contract.

(ii) If the request states that the NASA "Property Rights in Inventions" clause is required in any resulting contract and the work to be performed under the contract is severable and is only in part for NASA, then the work which is on behalf of NASA shall be identified in the contract and the NASA "Property Rights in Inventions" clause shall be made applicable thereto. That portion of the work for a Department shall likewise be identified and the clause contained in 9–107.2(b), or that in 9–107.3, as appropriate, shall be made applicable to such portion if a patent rights clause is required by this Regulation.

(iii) If the request states that the NASA "Property Rights in Inventions" clause is not required in any resulting contract and the work to be performed under the contract is not wholly on behalf of NASA, then the clause contained in 9–107.2(b) or that in 9–107.3, as appropriate, shall be used if a patent rights clause is required by this Regulation.

(iv) If the request states that the NASA "Property Rights in Inventions" clause is not required in any resulting contract and such contract is wholly on behalf of NASA, then no patent rights clause shall be included in such contract.

(v) If the NASA "Property Rights in Inventions" clause is stated as a requirement in any such contract, the then current "Property Rights in Inventions" clause will be furnished with the request for work and, if not furnished, it must be obtained from NASA and included in the contract.

(2) The price of any contract described in (1) above shall in no event be increased by reason of the inclusion of any patent rights clause in the contract.

(b) *Deviations.* No deviations shall be made under 1–109 in any NASA "Property Rights in Inventions" clause except in paragraph (g), (h)(ii),

(i), (j), and (k) thereof. Deviations from these paragraphs are hereby authorized if they parallel either variations authorized by the Regulation from the corresponding provisions of the Patent Rights clause of 9–107.2(b), or deviations from such corresponding provisions which have been approved under 1–109.3. Deviations other than those indicated above shall not be made without prior approval of NASA. Requests for such deviations, whether individual or blanket, shall be processed in accordance with 1–109.3.

9–108 Patent Rights Under Contracts for Personal Services. The following clause shall, except as otherwise provided in 7–503.9, be inserted in all personal services contracts for services to be performed by an individual as set forth in 7–502.

PATENTS (DEC. 1953)

(a) For the purpose of determining the rights of the Government and the Contractor in and to inventions, the Contractor agrees to be bound by all provisions of Executive Order 10096, dated 23 January 1950, and any orders, rules, regulations, or the like issued thereunder.

(b) The Contractor shall: (i) make written disclosure promptly to the Contracting Officer of all inventions of the Contractor which are conceived or first reduced to practice during the term of this contract, and sign and execute all papers necessary for conveying to the Government the right to which the Government is entitled in accordance with the determination made under the provisions of Executive Order 10096, or (ii) certify to the Contracting Officer that, to the best of the Contractor's knowledge and belief, no inventions have been conceived or first reduced to practice during the term of this contract.

9–109 Followup of Patent Rights. Appropriate systems of followup in connection with contracts for experimental, developmental, or research work shall be maintained by the Military Departments in order that inventions in which the Government may have an interest may be properly identified and formal agreements evidencing the Government's rights therein shall be obtained.

9–110 Reporting of Royalties.

(a)

(1) The Government has acquired license and other rights under a large number of inventions as the result of Government-sponsored research and development and in other ways. In order that the Government may determine whether the charging of royalties to the Government is inconsistent with the rights which the Government has acquired or is otherwise improper, and in order that negotiation for the reduction of excessive royalties may be undertaken, the Departments should be informed of royalties charged or to be charged in connection with the performance of Government contracts. DD Form 633, Cost and Price Analysis (see 16–206), and DD Form 784, Cost Analysis for Contract Price Redetermination (see 16–207), provide for reporting royalty information as required in (2). below. Royalty information generally should not be required in formally advertised procurements.

(2) *a.* Where it is expected that the work may be performed in the United States, its possessions, or Puerto Rico, any solicitation which may result in a negotiated contract estimated to exceed $10,000 shall contain a special provision substantially as follows:

ROYALTY INFORMATION (APR. 1959)

When the response to this solicitation contains costs or charges for royalties totaling more than $250, the following information shall be furnished with the offer, proposal, or quotation on each separate item of royalty or license fee:

(i) name and address of licensor;
(ii) date of license agreement;
(iii) patent numbers, patent application serial numbers or other basis on which the royalty is payable;
(iv) brief description, including any part or model numbers of each contract item or component on which the royalty is payable;
(v) percentage or dollar rate of royalty per unit;
(vi) unit price of contract item;
(vii) number of units; and
(viii) total dollar amount of royalties.

In addition, if specifically requested by the contracting officer prior to execution of the contract, a copy of the current license agreement and identification of applicable claims of specific patents shall be furnished.

b. Where the work is to be performed in the United States, its possessions, or Puerto Rico, the contracting officer, upon receipt of an offer, proposal, or quotation, which includes a charge for royalties, shall, prior to award of the contract, forward the information called for by *a* above to the office having cognizance of patent matters for the procuring activity concerned. The cognizant office shall promptly advise the contracting officer as to appropriate action. The contracting officer shall then take action in respect to such royalties, having due regard to all pertinent factors relating to the proposed procurement.

c. Where subcontract work is to be performed in the United States, its possessions, or Puerto Rico, the contracting officer, when considering approval of a subcontract, shall require the same information and take the same action with respect to such subcontracts in relation to royalties as required for prime contracts under *b* above.

(b) A reporting of royalties clause is not required in contracts where the work is to be performed in the United States, its possessions, or Puerto Rico. In negotiated contracts to be performed outside the United States, its possessions, or Puerto Rico, regardless of the place of delivery, the clause set forth below shall be included. See 16–806 for an approved form for optional use by contractors in submitting the required report.

REPORTING OF ROYALTIES (FOREIGN) (JAN. 1958)

If this contract is in an amount which exceeds $50,000, the Contractor shall report in writing to the Contracting Officer during the performance of this contract the amount of royalties paid or to be paid by the Contractor directly to others in the performance of this contract. The Contractor shall also (i) furnish in writing any additional information relating to such royalties as may be requested by the Contracting Officer and (ii) insert a provision similar to this clause in any subcontract hereunder which involves an amount in excess of the equivalent of fifty thousand United States dollars.

9–111 Adjustment of Royalties. If the contracting officer believes that any royalties paid, or to be paid, under a contract or prospective contract are unreasonable or otherwise improper, he should promptly report the matter to personnel having cognizance of patent matters for the procuring activity concerned. Such personnel shall review the royalties thus reported and such

royalties as are reported under 9–110. In coordination with the contracting officer, such personnel shall:

(i) take prompt action to protect the Government against payment of royalties on supplies or services (A) with respect to which the Government has a royalty-free license, or (B) at a rate in excess of the rate at which the Government is licensed, or (C) where the royalties in whole or in part constitute an improper charge;

(ii) in appropriate cases enter into negotiation for a voluntary reduction of royalties.

9–200 Scope of Part. This Part sets forth the Department of Defense policy, implementing instructions, and contract clauses with respect to acquisition and use of data and copyrights. The policy and procedures set forth in this Part apply to all data required to be delivered to the Government under a contract whether such data originates with the contractor or a subcontractor.

9–201 Definitions. For the purpose of this Part, the following terms have the meanings set forth below:

(a) *"Data"* means writings, sound recordings, pictorial reproductions, drawings, or other graphic representations and works of any similar nature whether or not copyrighted. The term does not include financial reports, cost analyses, and other information incidental to contract administration.

(b) *"Proprietary data"* means data providing information concerning the details of a contractor's secrets of manufacture, such as may be contained in but not limited to his manufacturing methods or processes, treatment and chemical composition of materials, plant layout and tooling, to the extent that such information is not disclosed by inspection or analysis of the product itself and to the extent that the contractor has protected such information from unrestricted use by others.

(c) *"Other data"* means all data other than "proprietary data" and includes:

(i) Operational data which provides information suitable among other things for instruction, operation, maintenance, evaluation or testing; and

(ii) Descriptive data which provides descriptive or design drawings or descriptive material in the nature of design specifications which, although not including any "proprietary data," may nevertheless be adequate to permit manufacture by other competent firms.

(d) *"Standard commercial items"* means supplies or services which normally are or have been sold or offered to the public commercially by any supplier.

9–202 Acquisition and Use of Data.

9–202.1 *Acquisition of Data.*

(a) *General.* It is the policy of the Department of Defense to encourage inventiveness and to provide incentive therefor by honoring the "proprietary data" resulting from private developments and hence to limit demands for data to that which is essential for Government purposes. The activity responsible for initiating a purchase request, after consultation with the procurement activity whenever feasible, will carefully determine the use contemplated for the data to be acquired and will specify only such data as is determined to be necessary to satisfy such use. All data received by the Government under a contract shall be identified with the number of the contract under which it is furnished. This may be accomplished by any appropriate means. Generally it should not be necessary to obtain "proprietary data" to satisfy Government requirements. The acquisition of data from a subcontractor shall be governed by the nature and circumstances of the subcontract, it being the intent of the Department of Defense that in obtaining data originating with subcontractors, the contractor shall, insofar as carrying out his obligations under a prime contract is concerned, be guided by the same policies and procedures as if the subcontractor were contracting directly with

the Government and should not request unlimited rights in "proprietary data" where such rights are not required by the Government under the prime contract.

(b) *Supply Contracts and Subcontracts Thereunder.* In advertised contracts and in contracts and subcontracts for standard commercial items, "proprietary data" shall not be requested. "Proprietary data" will be obtained for the Government under other supply contracts and subcontracts thereunder only when a clear Government need for such data is established and in such event the requirement for "proprietary data" will be specified in the contract Schedule (see the clause in 9-203.2). When "proprietary data" is obtained under supply contracts, there shall be a specific negotiation for such data and the contractual requirement shall be listed as a separate contract item.

(c) *Contracts for Experimental, Developmental, or Research Work and Subcontracts Thereunder.* In a contract which has as one of its principal purposes experimental, developmental, or research work and also calls for models of equipment or practical processes, the contractor shall be required to furnish to the Government for the price of the work all data resulting directly from performance of the contract, whether or not it would otherwise be "proprietary data." In addition, the contractor shall be required to furnish all data necessary to enable reproduction or, where appropriate, manufacture of the equipment or performance of the process which is developed, and the Schedule of the contract shall set forth the data required, subject to the exceptions set forth below:

(i) Such data shall not be required for standard commercial items to be furnished under the contract and to be incorporated as component parts in or to be used with the product or process being developed if in lieu thereof the contractor shall furnish identification of source and characteristics (including performance specifications, when necessary) sufficient to enable the Government to practice the process or to procure the part or an adequate substitute; and

(ii) "Proprietary data" shall not be required for other items, including minor modifications thereof, which were developed at private expense and previously sold or offered for sale and which are to be incorporated as component parts in or to be used with the product or process being developed, if in lieu thereof the contractor shall identify such other items and that "proprietary data" pertaining thereto which is necessary to enable reproduction or manufacture of the item or performance of the process.

Where the contractor asserts and it is determined in the negotiation preceding the execution of the contract that the contractor has previously developed "proprietary data," other than that described in (ii) above, that such data will be used in the product or process developed under the contract, and that such product cannot readily be manufactured or the process practiced without the use of such previously developed "proprietary data," a suitable price (or provision therefor) may be negotiated; *provided*, that the contractor requests payment for such data, and the Government does not have rights to such data (other than the "Limited Rights" provided for by the paragraph of 9-203.3).

9–202.2 *Use of Data.*

(a) *Other Data.* When data other than "proprietary data" is obtained, it shall be obtained without any limitation on its use by the Government.

(b) *"Proprietary Data."*

(1) *Supply Contracts.* When "proprietary data" is obtained by negotiation under a supply contract, in accordance with 9–202.1(b), the purposes for obtaining it will govern its use. If it is obtained for the purpose of enabling the Government to establish additional sources of supply, it shall be obtained without limitation as to its use; in such case the contract clause in 9–203.1 and 9–203.2 shall be included in the contract and the requirement for the "proprietary data" will be specified in the contract Schedule. However, where it has been determined to be necessary to obtain "proprietary data" for some limited purpose, such as emergency manufacture by the Government, such data may be obtained subject to limitation as to its use; in such case the contract clause in 9–203.1, 9–203.2 and 9–203.3 shall be included in the contract and the contract Schedule shall suitably identify the data which shall be subject to limited use.

(2) *Contracts for Experimental, Developmental, or Research Work.* When "proprietary data" is obtained under a contract having as one of its principal purposes experimental, developmental, or research work, in accordance with 9–202.1(c), it shall be obtained without limitation as to its use; in such case the contract clause in 9–203.1 and 9–203.4 shall be included in the contract.

9–202.3 *Multiple Sources of Supplies.* The Government's interest in establishing multiple sources for supplies and services arises when it is necessary to (i) insure fulfillment of its current and mobilization requirements or (ii) permit competition for defense procurement to avoid unreasonable prices. The policies in this Part provide one means for accomplishing this objective and are particularly effective where data, other than "proprietary data," acquired by the Government, is useable, without more, to obtain multiple sources. Where the use of "proprietary data" is necessary for the production of an item developed at private expense, it is the policy of the Department of Defense to honor the proprietary nature of such data since it is recognized that it is in the Government's interest to foster private development of items having military usefulness. Accordingly, "proprietary data," not otherwise obtained pursuant to the policy set out in 9–202.1 (c), will be obtained by the Government for the purpose of establishing multiple sources only where such sources cannot otherwise be established. This should occur only in isolated cases as necessary to achieve the objectives in (i) and (ii) above. In preference to having the Government obtain "proprietary data" for the purpose of creating multiple sources, it is the policy to achieve these objectives to the extent possible through one of the following procedures:

(i) The acquisition by the Government of "proprietary data" developed at private expense may be unnecessary where the primary source is willing to establish other sources by direct contractor licensing arrangements without Government participation. Where complex technical equipment is involved and the establishment of a satisfactory second source will require, in addition to data, technical assistance from the primary source or Government facilities or other

unusual assistance, Government participation in any licensing and technical assistance arrangements between contractors may be necessary to protect the Government's interest with respect to such factors, among others, as (A) investment in facilities, (B) competency of source, (C) timing of establishment of second sources, and (D) allocation of orders among sources.

(ii) The acquisition of "proprietary data" developed at private expense may be avoided in many cases by providing for the development of suitable substitutes for such sole source items through the use of performance specifications.

No single method can be prescribed for meeting the second source problem; each situation must be handled on its own merits.

9–202.4 *Delivery of Data for Use in Foreign Countries.* Where the Department of Defense proposes to make available any data in its possession for use in a foreign country, it shall, to the maximum extent practicable, give reasonable notice thereof to the contractor who furnished the data; *provided*, that the contractor has previously requested such notice in order to protect his foreign patent position.

9–202.5 *Copyrights.* It is the policy of the Department of Defense generally to reserve only a license under copyright on any copyrighted data, leaving the contractor free to copyright the material. With respect to certain data produced, written, or compiled for the Department of Defense, such as (i) motion pictures and works relating thereto, and (ii) histories and other works relating to operation of the Department of Defense, the Government may desire that no adverse claim of copyright be established in such data, and that the Government's right to reproduce and use such data shall be unlimited.

9–202.6 *Data Furnished on a Restricted Basis in Support of a Proposal.* When an offeror has submitted data on a restricted basis in accordance with 3–109 in response to a request for a proposal, and it is proposed to award the contract to such offeror, the contracting officer shall ascertain whether it is desired to acquire rights to use all or part of the data furnished with the proposal. If it is desired to acquire such rights, the contracting officer shall determine in accordance with 9–201 whether such data is proprietary in nature, and shall negotiate with the offeror in accordance with the policy prescribed in 9–202 for the acquisition and use of such data. If the offeror agrees to furnish such data under the contract, the appropriate clause of 9–203 shall be inserted in the contract, and the Schedule shall identify the data to be covered by such clause.

9–203 Contract Clauses—General. In every contract in which data is specified to be delivered, insert the clause of 9–203.1, except that this clause shall not be used in contracts (i) for the acquisition of existing works in accordance with 9–205, (ii) wherein the clause of 9–204 is used in accordance with the provisions of 9–204.2 and 9–204.3, (iii) utilizing DD Forms 1261 and 1270 or DD Form 1155, unless the contract is solely for the procurement of data, or (iv) to be performed outside the United States, its Territories, or possessions, or Puerto Rico where the clause of 9–206 applies. The additional paragraphs of 9–203.2, 9–203.3, and 9–203.4 will be added to the clause of 9–203.1 in

accordance with 9–202 and the instructions contained in 9–203.2, 9–203.3, and 9–203.4.

9–203.1 *Basic Data Clause.*

DATA (MAR. 1960)

(a) The term "Subject Data" as used herein includes writings, sound recordings, pictorial reproductions, drawings or other graphical representations, and works of any similar nature (whether or not copyrighted) which are specified to be delivered under this contract. The term does not include financial reports, cost analyses, and other information incidental to contract administration.

(b) The Contractor agrees to and does hereby grant to the Government, and to its officers, agents, and employees acting within the scope of their official duties, a royalty-free, nonexclusive and irrevocable license throughout the world for Government purposes to publish, translate, reproduce, deliver, perform, dispose of, and to authorize others so to do, all Subject Data now or hereafter covered by copyright; *provided*, that with respect to the Subject Data now or hereafter covered by copyright and not originated in the performance of this contract, such license shall be only to the extent that the Contractor, his employees, or any individual or concern specifically employed or assigned by the Contractor to originate and prepare such Data under this contract, now has, or prior to completion or final settlement of this contract may acquire, the right to grant such license without becoming liable to pay compensation to others solely because of such grant.

(c) The Contractor shall exert all reasonable effort to advise the Contracting Officer, at the time of delivery of the Subject Data furnished under this contract, (i) of all invasions of the right of privacy contained therein and (ii) of all portions of such Data copied from work not composed or produced in the performance of this contract and not licensed under this clause.

(d) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of copyright infringement received by the Contractor with respect to all Subject Data delivered under this contract.

(e) Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

(f) Subject to the proviso of (b) above and unless otherwise limited below, the Government may duplicate, use, and disclose in any manner and for any purpose whatsoever, and have others so do, all Subject Data delivered under this contract.

(g) The Contractor recognizes that the Government, or a foreign government with funds derived through the Mutual Security Program or otherwise through the United States Government, may contract for property or services with respect to which the vendor may be liable to the Contractor for charges for the use of Subject Data on account of such a contract. The Contractor further recognizes that it is the policy of the Government not to pay in connection with its contracts, or to allow to be paid in connection with contracts made with funds derived through the Mutual Security Program or otherwise through the United States Government, charges for data which the Government has a right to use and disclose to others, or which is in the public domain, or with respect to which the Government has been placed in possession without restrictions upon its use and disclosure to others. This policy does not apply to reasonable reproduction, handling, mailing, and similar administrative costs incident to the furnishing of such data. In recognition of this policy, the Contractor agrees to participate in and make appropriate arrangements for the exclusion of such charges from such contracts or for the refund of amounts received by the Contractor with respect to any such charges not so excluded.

(h) Notwithstanding any provisions of this contract concerning inspection and acceptance, the Government shall have the right at any time to modify, remove, obliterate or ignore any marking not authorized by the terms of this contract on any piece of Subject Data furnished under this contract.

9–203.2 *Provision for Addition to Basic Data Clause for Use in Supply Contracts.* The paragraph set forth below shall be added to the clause of 9–203.1 in all supply contracts in which data is specified to be delivered. This paragraph shall not, however, be included in a contract having as one of its principal purposes experimental, developmental, or research work.

(i) Notwithstanding any Tables or Specifications included or incorporated in the contract by reference, "proprietary data" need not be furnished unless suitably identified in the Schedule of the contract as being required. For the purpose of this clause, "proprietary data" means data providing information concerning the details of a Contractor's secrets of manufacture, such as may be contained in but not limited to his manufacturing methods or processes, treatment and chemical composition of materials, plant layout and tooling, to the extent that such information is not disclosed by inspection or analysis of the product itself and to the extent that the Contractor has protected such information from unrestricted use by others. (OCT. 1958)

When "proprietary data" is to be obtained in accordance with 9–202.1(b) and the above paragraph is included in the contract, the Schedule of the contract will state the extent of the proprietary data to be furnished.

9–203.3 *Limited Rights Provision for Addition to Basic Data Clause.* The paragraph set forth below shall be added to the clause set forth in 9–203.1 and 9–203.2 in negotiated contracts for supplies calling for "proprietary data" which is to be obtained subject to limitations on its use as provided for in 9–202.2(b)(1) and the Schedule of the contract will state the extent of the "proprietary data" to be furnished subject to such limitations. This paragraph shall not be included in a contract having as one of its principal purposes experimental, developmental, or research work.

(j) That portion of the Subject Data delivered under this contract which is identified in the Schedule as being subject to limitations shall not be released outside the Government, nor be duplicated, used, or disclosed in whole or in part for procurement or manufacturing purposes (other than for manufacture required in connection with repair or overhaul where an item is not procurable commercially so as to enable the timely performance of the overhaul or repair work; *provided,* when Data is released by the Government to a Contractor for such purposes, the release shall be made subject to the limitation of this clause; *provided further,* such Data shall not be used for manufacture or procurement of spare parts for stocks), without permission of the Contractor, if the following legend is marked on each piece of Data so limited either in its entirety or only partially as to its content:

Furnished under United States Government Contract No. _____ and only those portions hereof which are marked (for example, by circling, underscoring or otherwise) and indicated as being subject to this legend shall not be released outside the Government (except to foreign governments, subject to these same limitations), nor be disclosed, used, or duplicated, for procurement or manufacturing purposes, except as otherwise authorized by contract, without the permission of _____. This legend shall be marked on any reproduction hereof in whole or in part.

Provided, that such Data may be delivered to foreign governments as the national interest of the United States may require, subject to the limitations specified in this paragraph. The Contractor shall not impose limitations on the use of any piece of Data, or any portion thereof, which the Contractor has previously delivered to the Government without limitation. (JUN. 1959)

9–203.4 *Provision for Addition to Basic Data Clause for Use in Contracts for Experimental, Developmental, or Research Work.* The paragraph set forth below shall be added to the clause of 9–203.1 in every contract having as one of its principal purposes experimental, developmental, or research work and the

Schedule of the contract will specify the data to be required in accordance with 9-202.1(c).

(i) Data need not be furnished for standard commercial items or services which are normally or have been sold or offered to the public commercially by any supplier and which are incorporated as component parts in or to be used with the product or process being developed if in lieu thereof identification of source and characteristics (including performance specifications, when necessary) sufficient to enable the Government to procure the part or an adequate substitute, are furnished; and further, proprietary data need not be furnished for other items which were developed at private expense and previously sold or offered for sale, including minor modifications thereof, which are incorporated as component parts in or to be used with the product or process being developed, if in lieu thereof the Contractor shall identify such other items and that "proprietary data" pertaining thereto which is necessary to enable reproduction or manufacture of the item or performance of the process. For the purpose of this clause "proprietary data" means data providing information concerning the details of a Contractor's secrets of manufacture, such as may be contained in but not limited to its manufacturing methods or processes, treatment and chemical composition of materials, plant layout and tooling, to the extent that such information is not disclosed by inspection or analysis of the product itself and to the extent that the Contractor has protected such information from unrestricted use by others. (OCT. 1958)

9-204 Contract Clauses—Special.

9-204.1 *Limitation on Government's Right of Publication for Sale to the General Public.* The paragraph set forth below may be added to the clause of 9-203.1 when, in contracts for research, the contracting officer determines in accordance with Departmental procedures that public dissemination of the work or certain designated parts of the work specified to be delivered under contract is in the best interest of the Government and would be facilitated by the Government relinquishing its right to publish for sale or to have others publish for sale for it. This paragraph shall not be used otherwise.

( ) If, after final settlement of this contract, and within the period designated in the Schedule* for the purpose of this paragraph ( ) or otherwise approved by the Contracting Officer, but in any event within a period no greater than 24 months, the Contractor publishes for sale any Subject Data which are (i) designated in the Schedule* as being subject to this paragraph ( ) and (ii) delivered under this contract, the Government agrees not to publish such Data for sale or authorize others so to do. This limitation on the Government's right to publish for sale any such Data so published by the Contractor shall continue as long as the Data are protected by copyright. As to all such Data not so published by the Contractor, this paragraph shall be of no force or effect. (OCT. 1958)

*The word "Schedule" may be replaced by the words "Task Order," or other appropriate reference in accordance with Departmental procedures.

9-204.2 *Production of Motion Pictures.* The clause set forth below is approved for use in contracts for the production of motion pictures with or without accompanying sound, and in all contracts for the preparation of motion picture scripts, musical compositions, sound tracks, translations, adaptations, and the like:

RIGHTS IN DATA (JAN. 1958)

(a) The term "Subject Data" as used herein includes writings, sound recordings, pictorial reproductions, drawings or other graphical representations, and works of any similar nature (whether or not copyrighted) which are specified to be delivered under this contract. The term does not include financial reports, cost analyses, and other information incidental to contract administration.

[Contract clause continued on next page]

(b) All Subject Data first produced in the performance of this contract shall be the sole property of the Government. The Contractor agrees not to assert any rights at common law or equity and not to establish any claim to statutory copyright in such Data. The Contractor shall not publish or reproduce such Data in whole or in part or in any manner or form, nor authorize others so to do, without the written consent of the Government until such time as the Government may have released such Data to the public.

(c) The Contractor agrees to grant and does hereby grant to the Government and to its officers, agents and employees acting within the scope of their official duties, a royalty-free, nonexclusive, and irrevocable license throughout the world (i) to publish, translate, reproduce, deliver, perform, use, and dispose of, in any manner, any and all Data not first produced or composed in the performance of this contract but which is incorporated in the work furnished under this contract; and (ii) to authorize others so to do.

(d) The Contractor shall indemnify and save and hold harmless the Government, its officers, agents and employees acting within the scope of their official duties against any liability, including costs and expenses, (i) for violation of proprietary rights, copyright or right of privacy, arising out of the publication, translation, reproduction, delivery, performance, use or disposition of any Data furnished under this contract, or (ii) based upon any libelous or other unlawful matter contained in such Data.

(e) Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

(f) Paragraphs (c) and (d) above are not applicable to material furnished to the Contractor by the Government and incorporated in the work furnished under the contract; *provided*, such incorporated material is identified by the Contractor at the time of delivery of such work.

9–204.3 *Histories and Other Works.* The contract clause set forth in 9–204.2 is suggested for use in contracts for—

(i) histories of the respective Departments or services or units thereof;
(ii) works pertaining to recruiting, morale, training or career guidance;
(iii) surveys of Government establishments; and
(iv) works pertaining to the instruction or guidance of Government officers and employees in the discharge of their official duties.

9–205 Contracts for Acquisition of Existing Works.

9–205.1 *Off-the-Shelf Purchase of Books and Similar Items.* Notwithstanding the instructions of any other paragraphs in this Part, no contract clause contained in this Part need be included in contracts for the separate, sole procurement of data, other than motion pictures, in the exact form in which such material exists prior to the initiation of a request for purchase (such as the off-the-shelf purchases of existing products) unless the right to reproduce such data is an objective of the contract.

9–205.2 *Contracts for Existing Motion Pictures.* Contracts for the procurement of existing motion pictures or for the modification of existing motion pictures shall be made in accordance with Departmental procedures.

9–206 Contracts To Be Performed Outside the United States.

(a) Except as otherwise provided in 9–204.2, 9–204.3, or 9–205, the clause set forth below shall be included in all contracts under which (i) technical information including reports, drawings, blueprints or other data is specified to be delivered to the Government, and (ii) the work is to be performed outside the United States, its possessions, or Puerto Rico, regardless of the place of delivery.

1 July 1960

TECHNICAL INFORMATION (OCT. 1958)

The Government may duplicate, use, and disclose in any manner for its Government purposes, including delivery to other governments for the furtherance of mutual defense of the United States Government and such other governments, all or any part of the technical information including reports, drawings, blueprints, and other data specified to be delivered by the Contractor to the Government under this contract.

(b) The above clause may be modified by substituting "the United States Government" for "Government"; however, when the contractor is a foreign government, the above clause shall be modified by substituting "the United States Government" for "Government" and by substituting the name of the foreign government for "Contractor."

[Next page is 929]

1 July 1960

Part 3—Foreign License and Technical Assistance Agreements 929

9–301 General.

9–301.1 *Background.* In furtherance of the Mutual Security Program or for other national defense purposes, the Government may undertake to develop, or encourage the development of, foreign additional sources of supply. The development of such sources may be accomplished by an agreement, often called a foreign licensing agreement or technical assistance agreement, wherein a domestic concern, referred to in this Part as a "primary source," agrees to furnish to a foreign concern or government, herein referred to as a "second source," foreign patent rights; technical assistance in the form of data, know-how, trained personnel of the primary source, instruction and guidance of the personnel of the second source, jigs, dies, fixtures, or other manufacturing aids; and such other assistance, information, rights, or licenses as are needed to enable the second source to produce particular supplies or perform particular services. Agreements calling for one or more of the foregoing may be entered into between the primary source and (i) the Government, (ii) a foreign government, or (iii) a foreign concern. The consideration for providing such foreign licenses and technical assistance may be in the form of a lump sum payment, or payments for each item manufactured by the second source, or both, an agreement to exchange data and patent rights on improvements made to the article or service, capital stock transactions, or any combination of these. The primary source's bases for computing such consideration may include (i) actual costs, (ii) charges for the use of patents, data, or know-how reflecting the primary source's investment in development and engineering and production techniques, and (iii) the primary source's "price" for setting up a second source. Such agreements often refer to the compensation to be paid as a royalty or license fee whether or not patent rights are involved.

9–301.2 *Policy.* It is Government policy not to pay in connection with its contracts, and not to allow to be paid in connection with contracts made with funds derived through the Mutual Security Program or otherwise through the United States, charges for use of patents in which it holds a royalty-free license or charges for data which it has a right to use and disclose to others, or which is in the public domain, or which the Government has acquired without restriction upon its use and disclosure to others. This policy applies to foreign license and technical assistance agreements, first, in negotiating contract prices for foreign license and technical assistance contracts (9–302) or supply contracts with second sources (9–303), and second, in commenting on such agreements when they are referred to the Department of Defense by the Department of State pursuant to Section 414 of the Mutual Security Act of 1954 and the International Traffic in Arms Regulations (9–304).

9–302 Foreign License and Technical Assistance Contracts Between the Government and Domestic Concerns.

(a) Contracts between the Government and a primary source to provide technical assistance or patent rights to a second source for the manufacture of supplies or performance of services will, to the extent practicable, specify the rights in patents and data and any other rights to be supplied to the second source. Each contract shall provide in effect that, in connection with any separate agreement between the primary source (or any of his subcontractors)

and the second source for patent rights or technical assistance relating to the articles or services involved in the contract, that—

(i) the primary source (and his subcontractors) will not make, on account of any purchases by the Government or by others with funds derived through the Mutual Security Program or otherwise through the Government, any charge to the second source (A) for royalties or amortization for patents or inventions in which the Government holds a royalty-free license, or (B) for data which the Government has a right to possess, use, and disclose to others, or (C) for any technical assistance provided to the second source for which the Government has paid under a contract between the Government and the primary source; and

(ii) such separate agreement between the primary and second sources will conform to the requirements of the International Traffic in Arms Regulations (9–304).

(b) The following factors, among others, shall be considered in negotiating the price to be paid the primary source under contracts within (a) above:

(i) the actual cost of providing data, personnel, manufacturing aids, samples, spare parts, etc.;

(ii) the extent to which the Government has contributed to the development of the supplies or services, and to the methods of manufacture or performance, through past contracts for research and development or for manufacture of the supplies or performance of the services; and

(iii) the Government's patent rights and rights in data relating to the supplies or services and to the methods of manufacture or of performance.

9–303 Supply Contracts between the Government and Second Sources. In negotiating contract prices with a second source, including the redetermination of contract prices, or in determining the allowability of costs under a cost-reimbursement type contract with a second source, the contracting officer—

(i) shall obtain from the second source a detailed statement of royalties, license fees, or other compensation paid or to be paid to a primary source (or any of his subcontractors) for patent rights, rights in data, and other technical assistance provided to the second source, including identification and description of such patents, data and technical assistance; and

(ii) shall not accept or allow charges which in effect are (A) for royalties or amortization for patents or inventions in which the Government holds a royalty-free license, or (B) for data which the Government has a right to possess, use, and disclose to others, or (C) for any technical assistance provided to the second source for which the Government has paid under a contract between the Government and a primary source.

9–304 Foreign License and Technical Assistance Agreements Between Domestic Concern and Foreign Government or Concern.

9–304.1 *International Traffic in Arms Regulations.* Pursuant to Section 414 of the Mutual Security Act of 1954, as amended (22 U.S.C. 1934), the Department of State controls the exportation of data relating to articles designated in the United States Munitions List as arms, ammunition, or munitions of war. (The Munitions List and pertinent procedures are set forth in the International Traffic in Arms Regulations, 22 C.F.R. 121 *et seq.*). Before authorizing such exportation, the Department of State generally requests comments from the Department of Defense. Each Military Department will, on request of the Office of the Assistant Secretary of Defense (International Security Affairs), submit comments thereon as the basis for a Department of Defense reply to the Department of State. Such comments will be prepared in the light of the following excerpt from the International Traffic in Arms Regulations.

Sec. 124.3 REQUIRED PROVISIONS IN AGREEMENTS.

(a) Proposed technical assistance or manufacturing license agreements which may involve the transfer or interchange of technical data (see sections 121.8 and 121.9 of this chapter) should set out in detail the terms and conditions of such transfer or interchange and define in precise terms the following:

(1) The equipment and technology involved.
(2) The scope of the information to be furnished.
(3) The period of duration of the agreement.
(4) Statement of ownership.

(b) It is the general policy of the United States Government not to pay in connection with its purchases, or allow to be paid in connection with purchases made with Mutual Security Program funds, a charge for patent rights in which it holds a royalty-free license, or for technical data which it has a right to use and disclose to others for purposes of the Mutual Security Program, or which is in the public domain, or with respect to which it has been placed in possession without restriction upon its use and disclosure to others. Reasonable charges for reproduction, handling, mailing, and other similar administrative costs do not fall within this policy.

Pursuant to the above policy, agreements generally will not be approved unless written in such a way that (1) purchases of items by or for the United States Government, or with funds derived through the Mutual Security Program, will not include a charge (a) for technical data in the possession of the United States Government, or in which the United States Government has a right to possession, and regarding which there is no prohibition against use by the United States Government and disclosure to others and (b) for royalties or amortization for patents or inventions in which the United States Government holds a royalty-free license; and (2) the license rights transferred by such agreements will be subject to existing rights of the United States Government.

9–304.2 *Review of Agreements.*

(a) In reviewing foreign license and technical assistance agreements between domestic concerns and foreign governments or concerns, the Military Department concerned shall, insofar as its interests are involved, indicate whether the agreement meets the requirements of Section 124.3 of the International Traffic in Arms Regulations (9–304.1) or in what respects it is deficient. Paragraphs (b) through (g) below provide general guidance for such review.

(b) Where it is not reasonably anticipated that the Government will purchase from the second source the supplies or services involved in the agreement or that Mutual Security Program funds will be provided for the purchase of the supplies or services:

(1) It may suffice to fulfill the requirements of Section 124.3(b), quoted above, insofar as the Department of Defense is concerned, if:

(i) the agreement is so written that:

(A) the second source is required to advise the primary source when he has knowledge of any purchase made by or to be made from him by or for the Government or with funds derived through the Mutual Security Program or otherwise through the Government; and

(B) the second source agrees in the event of any such purchase to reflect in the purchase price of the article or service any reduction in the charges specified in the agreement, which is made by the primary source in respect to such purchases; and

(ii) the primary source agrees with the Government that upon advice to him from the second source, or from the Government or otherwise, as to any such purchase or prospective purchase, he will negotiate with the Department concerned an appropriate reduction in his charges to the second source in recognition of any Government rights in patents or data.

(2) If the agreement provides that no charge is being made to the second source for data or patent rights in which the Government has rights, or that no charge is being made to the extent of the Government's rights, the Department should:

(i) before indicating its approval, evaluate the acceptability of such provision, or

(ii) explicitly condition its approval on the right to evaluate the acceptability of such provision at a later appropriate time.

(c) Where it is reasonably anticipated that the Department will procure from the second source supplies or services involved in the agreement, or that Mutual Security Program funds will be provided for the procurement of the supplies or services:

(1) If the agreement specifies a reduction in charges thereunder, with respect to purchases by or for the Government or by others with funds derived through the Mutual Security Program or otherwise through the Government, in recognition of the Government's rights in patents and data, the Department should, before indicating its approval, evaluate the amount of the reduction to determine whether it is fair and reasonable in the circumstances.

(2) If the agreement does not specify any such reduction in charges or otherwise fails to give recognition to the Government's rights in the patents or data involved, a recommendation should be made, as a condition to approval, that the agreement be amended to reflect a reduction acceptable to the Government in any charge thereunder with respect to purchases made by or for the Government or by others with funds derived through the Mutual Security Program or otherwise through the Government, in accordance with Section 124.3(b), quoted above.

(3) If the agreement provides that no charge is being made to the second source for data or patent rights in which the Government has rights, or that no charge is being made to the extent of the United States' rights, the

Department should, before indicating its approval, evaluate the acceptability of such provision.

(4) If time or circumstances do not permit the evaluation of the reduction in charges provided for in the agreement as called for in (1) above, or the specifying of such a reduction as called for in (2) above, or the evaluation of the provision that no charge is made as called for in (3) above, the guidance in (b) above may be followed.

(d) Where there is a technical assistance contract between the primary source and the Government related to the separate agreement between the primary and second sources that is under review, such separate agreement should reflect the arrangements contemplated with respect thereto by the Government's technical assistance contract.

(e) Every agreement should provide that any license rights transferred by the agreement are subject to existing rights of the Government.

(f) In connection with every agreement within (c) above, a request should be made to the primary source to identify the patents, data, and other technical assistance to be provided to the second source by the primary source or any of his subcontractors; to identify any such patents and data in which, to the knowledge of the primary source, the Government may have rights; and to segregate the charges made to the second source for each such category or item of patents, data, and other technical assistance. Reviewing personnel will verify or obtain such information from Governmental sources so far as practicable.

(g) The Department concerned should make clear that its approval of any agreement does not necessarily recognize the propriety of the charge or the amount thereof or constitute approval of any of the business arrangements in the agreement, unless the Department intends by its approval to commit itself to the fairness and reasonableness of a particular charge or charges. In any event, such a disclaimer should be made to charges or business terms not affecting either the Government or any purchase made with funds derived through the Mutual Security Program or otherwise through the Government.

APPENDIX B

Net value of military prime contract awards of $10,000 or more to 112 selected companies for experimental, developmental, test, and research work,[1] fiscal years 1954–59

[Amounts in thousands]

Company [2]	1954 [3]	1955	1956	1957	1958	1959
ACF Industries, Inc	$8,515	$7,344	$3,366	$2,851	$8,642	$7,554
Acoustica Associates, Inc	(—)	(—)	(—)	250	1,836	4,595
Aerojet-General Corp	7,266	17,107	90,701	64,552	121,594	161,955
Aeronca Manufacturing Corp	(—)	(—)	(—)	(—)	(—)	1,188
Aeronutronic Systems, Inc	(—)	(—)	(—)	1,001	10,262	10,004
Air Logistics Corp	(—)	(—)	(—)	885	714	1,632
Air Products, Inc	289	624	1,149	791	4,349	6,056
Airborne Instruments Laboratory, Inc	2,581	2,194	2,624	4,507	3,606	18,725
American Bosch Arma Corp	4,135	1,978	3,705	32,225	44,338	54,230
American Machine & Foundry Co	7,717	3,332	8,239	12,856	12,850	17,997
American Optical Co	(—)	(—)	(—)	(—)	233	2,642
American Radiator & Standard Sanitary Corp.	(—)	8,744	1,605	3,017	2,701	4,746
Astrodyne, Inc	(—)	(—)	(—)	(—)	2,112	4,316
Atlantic Research Corp	851	164	1,087	1,631	2,046	5,079
Avco Corp	5,182	7,684	24,340	75,735	43,827	54,266
Baird Atomic, Inc	100	306	276	189	287	577
Beech Aircraft Corp	628	1,484	1,994	1,399	1,024	3,196
Bell Aircraft Corp	40,191	34,157	59,375	61,170	34,261	17,885
Bell Helicopter Corp	(—)	(—)	(—)	(—)	3,110	3,535
Bendix Aviation Corp	8,801	14,108	11,380	28,028	31,238	47,410
Boeing Airplane Co	75,239	54,029	81,964	150,094	245,323	155,781
Borg-Warner Corp	261	248	266	1,294	1,993	2,575
Brown Engineering Co., Inc	(—)	(—)	(—)	928	2,456	3,445
Burroughs Corp	698	2,715	4,578	20,616	25,224	37,796
Callery Chemical Co	814	2,200	8,352	5,245	6,280	14,943
Chrysler Corp	15,594	2,712	16,411	17,827	1,102	4,733
Clevite Corp	531	154	3,147	1,945	1,837	3,691
Collins Radio Co	894	1,706	11,675	13,471	17,013	24,929
Computer Control Co., Inc	278	(—)	478	608	591	1,014
Continental Aviation & Engineering Corp	5,498	4,759	2,353	3,692	2,553	2,494
Continental Electronics Manufacturing Co	(—)	249	3,268	672	2,392	8,861
Control Corp. of Minneapolis	(—)	(—)	(—)	(—)	(—)	4,965
Cook Electric Co	3,324	2,891	6,198	6,608	6,596	4,380
Cubic Corp	277	817	4,877	727	2,883	3,301
Curtiss-Wright Corp	20,899	43,770	33,757	24,655	4,241	8,261
Douglas Aircraft Co	5,482	5,469	28,498	116,091	136,849	208,266
Dumont (Allen B.) Laboratories, Inc	3,796	(—)	234	857	1,855	2,136
Eastman Kodak Co	6,478	1,360	5,323	6,028	12,136	3,188
Emerson Electric Manufacturing Co	540	434	1,675	(—)	3,307	3,344
Fairchild Camera & Instrument Corp	380	541	437	(—)	1,435	3,323
Fairchild Engine & Airplane Corp	2,155	3,935	18,720	29,052	41,456	17,047
Food Machinery & Chemical Corp	1,758	1,343	1,514	5,017	3,910	3,409
Garrett Corp	571	1,482	4,761	2,113	3,164	2,964
General Dynamics	[5] 1,775	51,914	94,966	211,191	256,093	313,061
General Electric Co	57,810	82,657	197,469	265,674	302,045	395,057
General Mills, Inc	1,172	1,625	4,285	7,279	5,240	9,421
General Motors Corp	7,719	13,880	20,655	56,656	54,352	85,828
Goodyear Aircraft Corp	(—)	(—)	16,414	13,727	20,118	24,919
Grumman Aircraft Engineering Corp	(—)	138	8,120	3,621	29,763	8,469
Hallicrafters Co	452	2,276	3,570	4,951	8,646	6,138
Harvey Aluminum, Inc	1,051	501	863	793	1,214	2,507
Hayes Aircraft Corp	(—)	(—)	218	958	15,270	11,333
Hazeltine Corp	462	1,591	1,836	2,317	3,701	7,808
Hercules Powder Co	5,469	4,813	5,742	5,021	10,552	21,184
Hoffman Electronics Corp	(—)	629	1,484	832	6,176	9,486
Hughes Aircraft Co	57,434	52,504	93,071	101,172	132,186	49,480
International Business Machines Corp	7,654	9,206	22,901	31,954	28,519	47,809
International Telephone & Telegraph Corp	4,939	7,592	10,271	15,879	16,040	42,563
Interstate Electronics Corp	(—)	(—)	(—)	2,105	1,962	4,982
Laboratory for Electronics, Inc	1,726	602	1,596	623	246	732
Land Air, Inc	504	987	3,385	5,034	6,589	8,323
LeTourneau (R.G.), Inc	327	503	633	176	490	2,426
Lear, Inc	747	414	1,745	1,466	921	686
Librascope, Inc	2,042	593	1,951	1,971	5,881	4,930
Link Aviation, Inc	1,417	1,014	2,297	(—)	(—)	897
Little (Arthur D.), Inc	661	1,405	1,657	2,124	3,539	3,404
Litton Industries, Inc	745	660	1,780	3,668	9,400	12,251
Litton Industries of Maryland, Inc	(—)	150	187	958	1,941	2,043
Lockheed Aircraft Corp	4,565	29,872	49,816	91,602	181,145	511,430
Magnavox Co	80	1,579	2,590	1,196	4,556	4,944
Marquardt Corp	2,110	3,136	9,083	26,130	11,082	9,389
Martin Co. (The)	22,655	18,222	95,348	150,086	168,904	284,039
McDonnell Aircraft Corp	14,901	6,584	10,911	30,055	15,666	32,441
Melpar, Inc	2,631	1,942	8,951	8,424	13,560	6,816
Minneapolis-Honeywell Regulator Co	4,187	6,933	12,786	18,930	17,283	19,285
Motorola, Inc	1,055	2,787	7,666	12,861	14,659	8,377

See footnotes at end of tables.

Net value of military prime contract awards of $10,000 or more to 112 selected companies for experimental, developmental, test, and research work,[1] *fiscal years 1954–59*—Continued

[Amounts in thousands]

Company [2]	1954 [3]	1955	1956	1957	1958	1959
National Co., Inc.	(—)	(—)	1,027	2,701	2,739	1,040
North American Aviation, Inc.	78,574	138,669	203,469	262,402	288,302	567,744
Northern Ordnance, Inc.	2,524	1,391	4,543	4,427	2,865	5,500
Northrop Corp.	22,533	21,653	60,988	68,749	118,164	23,086
Olin Mathiesen Chemical Corp.	4,291	5,690	11,818	7,709	12,425	13,738
Pan-American Air Ways, Inc.	(—)	(—)	(—)	(—)	54,816	71,380
Philco Corp.	5,604	4,889	9,460	6,954	13,829	13,025
Polytechnic Research & Development Co., Inc.	(—)	203	369	(—)	771	2,982
Radiation, Inc.	805	1,660	4,385	3,607	3,694	3,464
Radio Corp. of America	8,983	30,043	48,613	43,779	60,817	40,589
Raytheon Co.	5,371	15,487	49,986	53,421	65,576	62,180
Republic Aviation Corp.	7,223	2,831	19,476	23,265	2,334	27,962
Rheem Manufacturing Co.	3,018	1,932	7,192	4,170	4,032	7,569
Robertshaw-Fulton Controls Co.	(—)	(—)	(—)	(—)	424	614
Rohm & Haas Co.	1,400	1,734	1,799	1,978	1,917	3,024
Ryan Aeronautical Co.	3,095	6,575	7,274	4,310	6,995	5,044
Sanders Associates, Inc.	1,025	1,378	1,981	974	1,963	6,642
Sangamo Electric Co.	(—)	(—)	428	(—)	(—)	10,740
Solar Aircraft Co.	(—)	831	1,455	1,846	2,266	3,223
Space Technology Laboratories	(—)	(—)	(—)	(—)	(—)	61,030
Sperry Rand Corp.	24,544	30,201	30,745	87,389	139,288	208,951
Stavid Engineering, Inc.	1,538	3,182	2,442	5,059	4,271	4,259
Sundstrand Corp.	(—)	(—)	(—)	(—)	3,818	9,712
Sylvania Electric Products, Inc.	4,210	3,475	13,630	16,243	19,801	27,401
Telecomputing Corp.	96	(—)	1,208	1,983	3,814	3,373
Telemeter Magnetics, Inc.	(—)	(—)	153	684	531	635
Temco Aircraft Corp.	(—)	1,193	(—)	14,862	12,803	14,541
Texas Instruments, Inc.	(—)	525	1,405	361	2,645	3,052
Thiokol Chemical Corp.	3,548	8,118	9,598	20,191	33,386	73,871
Thompson Ramo Wooldridge, Inc.	857	1,120	13,549	36,008	46,457	17,403
United Aircraft Corp.	20,558	30,969	15,846	63,179	22,949	78,651
Universal Match Corp.	999	1,039	1,377	623	1,219	3,585
Vertol Aircraft Corp.	11,858	2,377	1,555	2,546	1,481	7,471
Vitro Corp. of America	3,331	4,702	5,084	6,360	10,444	9,835
Western Electric Co., Inc.	28,253	103,949	131,993	76,829	116,736	226,037
Westinghouse Electric Corp.	25,953	24,856	54,674	58,469	163,447	120,916

[1] Includes the 100 business firms receiving the largest dollar volume of awards for such work in fiscal year 1959, and 12 companies designated in letter dated July 18, 1960, from U.S. Senate Committee on the Judiciary, Subcommittee on Patents, Trademarks, and Copyrights.

[2] Company name is one in effect on June 30, 1959.

[3] Based on awards of $50,000 or more each. Data for subsequent years are based on awards of $10,000 or more.

[4] Data for fiscal years 1955–57 are for the Detroit Controls Co., a wholly owned subsidiary, which was merged in fiscal year 1958.

[5] Excludes awards to Consolidated-Vultee which was acquired in fiscal year 1955.

NOTE.—A dash (—) indicates that the company did not appear among the 500 companies receiving the largest dollar volume of experimental, developmental, test, and research awards in the year indicated.

APPENDIX C

Licenses granted by the military departments for the use of patents owned by the Government, Jan. 1, 1946, to June 30, 1960

ADMINISTERED BY THE ARMY

Patent No.	Product involved	Names of licensees	License date
2,164,330	Fully molded gas mask facepiece	Ray-O-Vac Co	June 15, 1956
2,165,123	Contact microphone	Victoria Radio & Appliance Co	Apr. 23, 1954
2,175,743	Priming system for internal combustion engines.	Olin Mathieson Chemical Corp	Aug. 31. 1956
2,283,185	Diesel engine starter	do	Do.
2,284,640	Breech mechanism for power generating units.	do	Do.
2,299,464	Power generating unit	do	Do.
2,344,669	Dust respirator	Ray-O-Vac Co	June 15, 1956
2,368,678	Test probe	Vemaline Products Co	Oct. 19, 1954
2,379,459	Temperature indicators	Thermo Products Co., Inc	Sept. 28, 1956
2,386,878	Apparatus for determining blood volume.	American Instrument Co., Inc	July 18, 1950
2,390,848	Rodenticides	E.I. du Pont deNemours & Co	Jan. 3, 1946
		General Chemical Co	Apr. 23, 1946
		Pittsburgh Coke & Chemical Co	May 31, 1946
		Lawrence Laboratories	Aug. 11, 1947
		Fine Organics, Inc	May 19, 1947
		Remsen Chemical Co., Inc	Dec. 16, 1947
		Southside Chemical Co., Inc	Feb. 5, 1948
		Robert B. Stotts	Aug. 20, 1954
2,393,005	Ear protectors	Mine Safety Appliances Co	Dec. 5, 1946
		Thomas C. Harris	Sept. 10, 1957
		Ray-O-Vac Co	Apr. 26, 1956
2,393,340	Applicators for ear protectors	Ray-O-Vac Co	Apr. 24, 1956
2,411,338	Wave guides	Western Electric Co., Inc	May 6, 1949
2,416,939	Speech transmitters for masks	Ray-O-Vac Co	Apr. 26, 1956
2,422,957	1-Bromo-4-(N-Alkylamino)-Hexanes and processes of making them.	E.R. Squibb & Sons	July 18, 1947
		Eli Lilly & Co	Aug. 5, 1947
2,423,306	Transmission lines	Bliley Electric Co	July 9, 1958
2,426,194	Inks	Vernon Johnson Enterprises	Mar. 6, 1956
2,436,145	Nephelometer for assaying penicillin.	Schenley Laboratories, Inc	June 11, 1948
2,446,835	Compression-wave delay devices	Bliley Electric Co	July 9, 1958
2,451,893	Stagger tuned amplifiers	The Turner Co	Oct. 30, 1950
2,454,676	Adhesive compositions	Norkay Products Co	June 18, 1954
2,458,884	Ear protector valves	Ray-O-Vac Co	Apr. 26, 1956
2,464,198	Processes for preparing a chemical composition for water purification.	Fine organics, Inc	Feb. 6, 1952
2,464,199	Alkylamino alkyl bromides	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947
		Abbott Laboratories	[1] Do.
2,465,437	High-G centrifuge	Flitton & Kissinger Engineering Corp.	Dec. 17, 1957
2,466,127	Outlet valve diaphragm assembly	Ray-O-VAC Co	June 15, 1956
2,468,721	Earphone sockets and noise shields	William J. Murdock Co	Aug. 16, 1946
		Sponge Rubber Products Co	Sept. 6, 1946
2,477,479	Antimalarials and processes of making them.	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947
2,477,480	Antimalarial compounds and processes of making them.	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947
		Abbott Laboratories	[1] Do.
2,480,205	Stagger damped tuned amplifiers	The Turner Co	Oct. 30, 1950
2,485,162	7-Chloro-4-(1-Ethyl-4-Piperidyl-amino)-Quinoline.	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947
		Abbott Laboratories	Do.[1]
2,485,174	Basic side chain substituted quinoline derivatives.	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947
2,488,361	Hydraulic control means for internal-combustion engines.	Packard Motor Car Co	[1]Aug. 14, 1948
2,492,467	Quinoline compounds having antimalarial properties.	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947
		Abbott Laboratories	Do.[1]
2,492,487	Quinoline derivatives having antimalarial properties.	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947
2,494,851	Methods for producing 5, 6-Dimethoxy-8-Nitroquinoline.	E. R. Squibb & Sons	[1]July 18, 1947
		Eli Lilly & Co	[1]Aug. 5, 1947

See footnotes at end of table.

Licenses granted by the military departments for the use of patents owned by the Government, Jan. 1, 1946, to June 30, 1960—Continued

ADMINISTERED BY THE ARMY

Patent No.	Product involved	Names of licensees	License date
2,495,276	Processes for making multipiece molds.	Jersey Carpet Cleaners	Jan. 8, 1954
2,498,165	Processes for producing Bacitracin.	Commercial Solvents Corp.	[1] Apr. 19, 1948
		Eli Lilly & Co.	[1] Do.
		Merck & Co., Inc.	[1] Do.
		Schenley Laboratories, Inc.	[1] Do.
		E. R. Squibb & Sons	[1] Do.
		S. B. Penick & Co.	[1] May 13, 1948
		Pabst Brewing Co.	Oct. 19, 1951
		The Upjohn Co.	[1] Aug. 23, 1948
		Chas. Pfizer & Co., Inc.	[1] Aug. 3, 1949
2,498,174	Aluminum Hexacarbamide Periodide as water disinfectant.	Fine Organics, Inc.	May 28, 1952
2,502,264	Quinoline derivatives having antimalarial properties.	E. R. Squibb & Sons	[1] July 18, 1947
		Eli Lilly & Co.	[1] Aug. 5, 1947
2,504,875	Methods for producing 4-Hydroxyquinolines.	General Aniline & Film Corp.	Mar. 14, 1951
		E. R. Squibb & Sons	[1] July 18, 1947
		Eli Lilly & Co.	[1] Aug. 5, 1947
		Abbott Laboratories	[1] Do.
2,504,895	Methods for preparation of intermediate compounds suitable for conversion into nuclear substituted heterocyclic compounds.	General Aniline & Film Corp.	Mar. 14, 1951
		E. R. Squibb & Sons	[1] July 18, 1947
		Eli Lilly & Co.	[1] Aug. 5, 1947
2,504,896	Methods of preparing intermediates suitable for conversion into nuclear substituted heterocyclic compounds.	E. R. Squibb & Sons	[1] July 18, 1947
		Eli Lilly & Co.	[1] Aug. 5, 1947
2,505,515	Compressional wave delay means.	Bliley Electric Co.	July 9, 1958
2,508,584	Differential bellows control devices.	Rotron Mfg. Co., Inc.	May 20, 1952
2,508,937	4-methyl-8-(dialkyl aminoalkylamino) quinolines and methods for their production.	E. R. Squibb & Sons	[1] July 18, 1947
		Eli Lilly & Co.	[1] Aug. 5, 1947
2,512,130	Delay means	Bliley Electric Co.	July 9, 1958
2,512,156	do	do	Do.
2,512,551	Methods for the recovery of 7-substituted-4-hydroxyquinolines.	E. R. Squibb & Sons	[1] July 18, 1947
		Eli Lilly & Co.	[1] Aug. 5, 1947
2,521,824	Electronic switches	Victoria Radio & Appliance Co.	May 14, 1954
2,532,546	Moving target indicating systems.	Bliley Electric Co.	July 9, 1958
2,537,021	Insect repellents	Morris A. Cohen	Aug. 19, 1955
	do	Joseph J. Jones	Aug. 23, 1957
2,537,022	do	Morris A. Cohen	Aug. 19, 1955
2,537,023	do	do	Do.
	do	Joseph J. Jones	Aug. 23, 1957
2,540,720	Transmission lines	Bliley Electric Co.	July 9, 1958
2,543,439	Methods of manufacturing coated elements for electron tubes.	Semicon Associates, Inc.	June 2, 1958
2,546,150	Method for securing adhesion of electroplated coatings to a metal base.	Hughes Plating Co.	July 13, 1955
		The Schaible Co.	Aug. 19, 1955
2,557,096	Radiation detecting device	The Perkin-Elmer Corp.	[2] Jan. 27, 1955
2,567,199	Insect repellants	Morris A. Cohen	Aug. 19, 1955
2,567,200	do	do	Do.
2,568,576	Counterbalanced crankshafts for internal-combustion engines.	Packard Motor Car Co.	[1] Aug. 14, 1948
2,575,360	Magnetic fluid torque and force transmitting device.	Eaton Manufacturing Co.	Mar. 11, 1952
		The Clark Manufacturing Co.	Apr. 23, 1952
		The Empire Motor Sales	May 8, 1952
		Lynch-Jamentz Co.	Aug. 25, 1952
		Lear, Inc.	Dec. 10, 1952
		Paul Whitfield	Jan. 20, 1960
		Buckeye Tools Corp.	Apr. 13, 1954
		Arcata Machine & Engineering Co.	Jan. 19, 1959
2,577,540	Wave guide T bridge detecting apparatus.	Western Electric Co., Inc.	May 20, 1952
2,577,500	Absorbing means for delay lines	Bliley Electric Co.	July 9, 1958
2,581,840	Insect repellants	Morris A. Cohen	Aug. 19, 1955
2,581,841	do	do	Do.

See footnotes at end of table.

Licenses granted by the military departments for the use of patents owned by the Government, Jan. 1, 1946, to June 30, 1960—Continued

ADMINISTERED BY THE ARMY

Patent No.	Product involved	Names of licensees	License date
2,581,842	Insect repellants	Morris A. Cohen	Aug. 19, 1955
2,584,105	do	do	Do.
2,585,916	Crystal analysis apparatus	P. A. Dana, Inc	Jan. 18, 1955
2,589,861	Microwave frequency modulated transmitters.	Western Electric Co., Inc	Mar. 25, 1958
2,590,110	Systems for producing an encoding device.	The Baldwin Piano Co	May 21, 1954
2,606,107	Incendiary compositions and methods of making same.	The Noxzema Chemical Co. of Canada, Ltd.	Oct. 10, 1952
		Metasap Chemical Co	Oct. 30, 1952
2,614,992	Paint stripping compositions	Norkay Products Co	June 18, 1954
		Fine Organics, Inc	Feb. 4, 1955
2,617,380	Signaling apparatus	Victoria Radio & Appliance Co	Apr. 23, 1954
2,617,925	Receiver transmitter	do	Do.
2,619,078	Cylinder head assembly for internal-combustion engines.	Packard Motor Car Co	[1] Aug. 14, 1948
2,619,189	Lubricating system for internal-combustion engines.	do	[1] Do.
2,622,713	High-speed magnetic fluid clutch	Buckeye Tools Corp	Apr. 13, 1954
2,624,804	Solid delay line	Bliley Electric Co	July 9, 1958
2,624,852	Backing for delay line crystals	do	Do.
2,627,487	Insect repellants	Morris A. Cohen	Aug. 19, 1955
2,627,489	do	do	Do.
2,629,471	Radial flux magnetic clutch	Buckeye Tools Corp	Apr. 13, 1954
2,636,060	Primary battery and method of making the same.	RAY-O-VAC Co	Feb. 9, 1955
2,639,306	Pile battery fabrication	do	Do.
2,640,987	Armored garment	Stein Bros. Manufacturing Co	Aug. 5, 1954
2,643,221	Electrodeposition of alloys	Hughes Plating Co	July 13, 1955
2,646,585	Washing apparatus	Bloomfield Industries, Inc	[1] Nov. 28, 1951
		Commercial Appliance Co	[1] Sept. 8, 1952
		Market Forge Co	[1] Sept. 24, 1952
		The Salvajor Co	[1] Apr. 6, 1953
2,656,355	Purification of cyclonite	E. I. du Pont de Nemours & Co	Jan. 6, 1956
2,658,846	Soldering flux	Metachem Laboratories, Inc	Aug. 24, 1955
2,659,080	Self-synchronous moving target indication system.	Bliley Electric Co	July 9, 1958
2,664,370	Soldering flux	Marlyn Chemical Co., Inc	June 10, 1955
		Metachem Laboratories, Inc	July 13, 1955
		L. G. Immonen	Sept. 16, 1955
2,664,371	do	Metachem Laboratories, Inc	Aug. 24, 1955
		L. G. Immonen	Sept. 16, 1955
2,669,700	Cup-core assembly for inductors	Caddell-Burns Manufacturing Co., Inc.	Feb. 19, 1957
2,712,864	Magnetic fluid torque and force transmitting device.	Dynatech Manufacturing Co	June 1, 1960
2,675,256	Telescopic structure	Hiawatha Equipment Co	Jan. 30, 1956
2,676,268	Radiation measuring instrument	Rayalarm, Inc	May 12, 1955
2,683,326	Rodent exterminating device	Service Ideas, Inc	Apr. 25, 1956
		Southern Plastics Engineering Corp.	June 15, 1956
2,683,667	Heat insulating coating	R. F. Woychick Co	Dec. 6, 1955
		Chas. S. Wood & Co	Do.
2,686,969	Container band severing tool	Gartner Mechanical Engineering Co.	June 15, 1956
2,689,876	Solid ion electrolyte battery	Catalyst Research Corp	Mar. 24, 1958
2,690,913	Magnetic memory device	Remington Rand, Inc	Feb. 4, 1955
2,700,695	Plastic battery case	Southern Plastics Engineering Corp.	June 15, 1956
2,702,072	Folding dental operating chair	The Weber Dental Manufacturing Co.	[1] Apr. 23, 1954
2,705,249	Primary alkaline cell	Burgess Battery Co	July 13, 1955
2,708,244	Piezoelectric transducers using lead titanate and lead zirconate.	Brush Crystal Co., Ltd	Dec. 18, 1956
		Electrovox Co., Inc	June 5, 1958
2,715,616	Organic coating for wire	Southwestern Manufacturing Co	Apr. 23, 1956
2,720,992	Drum handling mechanism for lift trucks.	Little Giant Products, Inc	Dec. 5, 1956
2,758,936	Investment casting of metals	Alexander Saunders & Co	Dec. 14, 1956
2,771,121	Method and machine for adhesively lap seaming fabric.	Novelty Bias Binding Co	Mar. 22, 1957
2,787,767	Filter structure	Alladin Electronics, Division of Alladin Industries, Inc.	Aug. 2, 1957
2,796,364	Method of forming an adherent film of magnesium oxide.	General Electric Co	May 7, 1958
2,809,004	Holders for electronic components	Atlas E-E Corp	Jan. 9, 1958
2,816,113	Alkyl pyridinium salt	Campbell Pharmaceuticals, Inc	Feb. 24, 1959
	2-carboxaldehyde oximes and process of preparation.	Aldrich Chemical Company, Inc	Do.
2,818,852	Spring-pressed surgical instrument.	United Surgical Supplies Co., Inc	Feb. 7, 1958

See footnotes at end of table.

Licenses granted by the military departments for the use of patents owned by the Government, Jan. 1, 1946, to June 30, 1960—Continued

ADMINISTERED BY THE ARMY

Patent No.	Product involved	Names of licensees	License date
2,844,217	Spring motor apparatus	Utility Tool & Body Co., Inc.	July 16, 1959
2,845,348	Electro-photographic means and method.	Readex Microprint Corp	Sept. 24, 1959
2,856,869	Bread dough molding machine	Delta Machine & Manufacturing	Oct. 6, 1959
2,857,249	Method of purifying silicon tetrachloride.	Allegheny Electronic Chemicals Co.	Mar. 12, 1959
		International Metalloids, Inc. (Puerto Rico).	Jan. 6, 1959
2,890,395	Semiconductor construction	Gerald Kay	June 1, 1960
Reissue 23,883	Cuprous chloride electrodes	Ray-O-Vac Co	Feb. 9, 1955
Reissue 24,191	Piezoelectric transducers using lead titanate and lead zirconate.	Sprague Electric Co	June 18, 1959
Reissue 24,408	Solid electrolyte battery	The Beacon Co	July 9, 1958

ADMINISTERED BY THE NAVY

2,363,029 2,363,030 2,363,031 2,363,104 2,393,008	Flotation of magnesite ores	Basic Refractories, Inc	Aug. 19, 1949
2,437,482	High-frequency electrical transmission line.	Communication Products Co., Inc.	Feb. 2, 1949
2,448,993	Method of producing magnesium base alloys.	The Dow Chemical Co	Sept. 1, 1951
2,474,463	Wire dispenser	Charles M. Whelan	May 1, 1953
2,363,029 2,363,030 2,363,032 2,363,104	Flotation of magnesite ores	Southern Minerals, Inc	Jan. 4, 1954
2,578,623	Concentration of thorium	do	Feb. 26, 1954
2,525,107 2,574,190	Coating composition for metals	Vemaline Products Co	Feb. 15, 1954
2,676,942	Apparatus for heat-sealing films	National Pipe Coatings, Inc	Nov. 8, 1954
2,676,942	do	Chemical Coatings & Engineering Co.	Aug. 16, 1954
2,606,966	Phase shifting network	Western Electric Co	Dec. 31, 1954
2,629,004	Electrical micrometer	Self Winding Clock Co., Inc	Nov. 23, 1955
2,629,004	do	The Kybernetes Corp	Do.
2,756,165	Electrically conducting coating	The Haloid Co	June 23, 1958
466,406 (serial number).	Helicopter stability and control	Kellett Aircraft Corp	Feb. 10, 1958
2,451,876	Radio-frequency mixer	Western Electric Co., Inc	Sept. 26, 1958
2,664,502	High-frequency wide band amplifier.		
2,606,966	Visual gain and delay sets for use on carrier current communication systems.		
2,700,891	Direct-reading viscometer	G. F. Bush Associates	Jan. 8, 1959
2,750,588	Wave guide terminating device	Airtron, Inc	Do.
2,595,791	Helixtype of magnetostriction core construction.	Roberts Electric Co	Do.
2,816,232	Germanium for infrared detector	The Perkin-Elmer Corp	Do.
2,820,930	Transistor holders	Ideal-Aerosmith, Inc	Do.
2,697,736	Rechargeable lead dry cell	Ayco Products	Do.
2,720,470	Allylaroxydichlorosilane and method of its preparation and application to glass.	S. B. Penick & Co	Do.
2,589,403	Transducer constriction and method.	Bliley Electric Co	Do.
2,596,460	Multichannel filter		
2,702,885	Supersonic delay line		
2,703,867	Delay line		
2,731,573	Ultrasonic coupling means for piezoelectric crystals.		
2,773,996	Transducer for producing sound at microwave frequencies.		
633,807 (serial number).	Wind tunnel device	CONVAIR (a division of General Dynamics Corp.).	Jan. 15, 1959
2,595,791	Transducer	Humble Oil & Refining	Feb. 27, 1959
2,731,320	Sliding hinge	General Devices Co., Inc	Nov. 12, 1959
2,827,968	Control of helicopter stability by inertia device.		
2,813,460	Sinusoidal light chopper	W. Wallin Associates	Do.
2,820,930	Transistor holders	Gerald Kay	Do.
2,894,971	Polyfluoroalkyl p-toluenesulfonates.	E. I. du Pont de Nemours & Co.	Do.
2,881,043	Shock spectrum instrument	Pittsburgh Engineering Labs	Dec. 2, 1959

See footnotes at end of table.

Licenses granted by the military departments for the use of patents owned by the Government, Jan. 1, 1946, to June 30, 1960—Continued

ADMINISTERED BY THE NAVY

Patent No.	Product involved	Names of licensees	License date
2,771,663	Method of making modular electronic assemblies.	Illinois Tool Works	Mar. 17, 1960
2,774,014	Modular electronic assembly	do	Do.
2,892,129	Electronic module mounting device.	do	Do.
2,894,909	Synthetic lubricant	Beacon Chemical Industries, Inc.	Apr. 1, 1960
2,910,251	Plastics winding machine	Johnson & Bassett, Inc.	Do.
2,902,630	Hermetically sealed package for electronic components.	Gerald Kay	July 26, 1960
2,834,922	Circular method of electronic assembly.	do	Do.
2,895,061	Piezoelectric sandwich transducer.	International Ultrasonics, Inc.	Aug. 25, 1960

ADMINISTERED BY THE AIR FORCE

2,496,564	Low melting point silver solders.	Vemaline Products Co	Apr. 2, 1956
2,475,469	High temperature ceramic coating for metals.	do	Do.
2,475,470	High temperature ceramic coating material.	do	Do.
2,731,847	Nonclash gear shifting mechanism.	Industrial Products, Inc	May 22, 9156
2,770,139	Hermetically sealed torque transmission system.	Vemaline Products Co	Feb. 23, 1957
2,781,416	Automatic audiometer to produce a printed record of a patient's hearing response.	Sound Control, Inc	May 31, 1957
2,810,839	Container for radioactive material.	Picker X-Ray Corp	Jan. 23, 1958
2,803,327	Automatic locks for roller conveyor gates.	Alvey-Ferguson Co	Apr. 1, 1958
2,820,469	Compensated inhalation and exhalation valve for high altitude mask.	General Tire & Rubber Co	Feb. 17, 1960

[1] License granted before patent issued.
[2] Only claim 16.

APPENDIX D

SUMMARIES OF RESPONSES BY DEPARTMENT OF DEFENSE CONTRACTORS TO THE QUESTIONNAIRE OF THE SUBCOMMITTEE

The subcommittee, in an effort to obtain information as to the patent aspects of Department of Defense research and development activity, sent a questionnaire to most of the leading prime contractors and to representative small prime contractors. The data contained in the following summaries were obtained either directly from the firm or from other sources. The subcommittee has not attempted so far to conduct an independent verification of the information supplied in response to its questionnaire. It will be observed that there are some significant variations as to the dollar volume of DOD R. & D. contracts between the figures supplied by the Department of Defense and those furnished by the defense contractors.

The summaries are arranged in alphabetical order by the name of the firm and unless otherwise indicated cover the 1949–59 period.

A.C.F. INDUSTRIES

Number of R. & D. contracts: Approximately 350.
Dollar volume of R. & D. contracts: $41,466,000.
Expenditure of company funds for research: $12,478,000.
Percentage of sales to the Government: 31.
Number of patent applications filed by the contractor: 43.

Number of these applications which have resulted in patents: 6.
Number of these applications still pending: 37.
Total number of patent applications filed by this firm: 483.
Number of these applications which have resulted in patents: 257.
Number of these applications still pending: 177.
Commercial use: None.

ACOUSTICA ASSOCIATES INC.

Number of R. & D. contracts: Acoustica was incorporated in April 1954 and from that date until June 30, 1959, received five contracts.
Dollar volume of R. & D. contracts: $3,520,600.
Expenditure of company funds for research: From its incorporation in 1954 to June 30, 1959, Acoustica spent approximately $500,000 of private funds for research.
Percentage of sales to the Government: 90.
Number of patent applications filed by the contractor: five.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: five.
Total number of patent applications filed by this firm: 22.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: 22.
Commercial use: Although no patents have been issued as a result of Acoustica's Government research and development contracts, commercial sales totaling under $10,000 in value have been made of some of those items for which patent applications have been submitted. These devices include principally Acoustica's ultrasonic liquid level point sensors, the basic patent application for which was filed prior to any governmental research and development contract. However, these devices as presently fabricated are based on improved designs which resulted from Government research and development contracts and for which subsequent patent applications have been made. Over 95 percent of the sales of these devices have been for ultimate Department of Defense use. The total dollar value of these sales has been approximately $1 million. No companies other than Acoustica make and sell exactly the same devices.

AEROJET GENERAL

(A subsidiary of the General Tire & Rubber Co.)

Number of R. & D. contracts: Between the period of July 1, 1949, and June 30, 1959, Aerojet was awarded 247 prime and 74 subcontracts.
Dollar value of R. & D. contracts: The dollar value of the 247 prime contracts was $541,494,402. The dollar value of the 74 subcontracts was $148,251,315. The total value of the 321 prime and subcontracts was $689,745,717.
Expenditure of company funds for research: $3,596,833.
Percentage of sales to the Government: 98.9.
Number of patent applications filed by the contractor: 328.
Number of these applications which have resulted in patents: 25.
Number of these applications still pending: 203.

Total number of patent applications filed by this firm: 440.
Number of these applications which have resulted in patents: 52.
Number of these applications still pending: 271.

Commercial use: Aerojet has not realized any commercial use from patents issued as a result of Department of Defense research and development contracts awarded Aerojet during the period of July 1, 1949, to June 30, 1959. Any commercial benefits realized by Aerojet arising out of patents issued as the result of Department of Defense research and development contracts, resulted from contracts issued prior to July 1, 1949. These benefits primarily relate to solid propellant jet assisted takeoff (JATO) units and the number of these units sold commercially are incidental to the sales of these same type units to the Government. Since the inception of the company, less than 1,000 solid propellant JATO units have been sold commercially while more than 530,000 such units have been sold to the Government under prime and subcontracts.

Aerojet has granted no license to third parties for patents issued as a result of R. & D. contracts awarded since 1949. However, Aerojet has granted a license to a third party to manufacture and sell a pressure sensing transducer which is the subject of a patent resulting from a contract awarded prior to July 1, 1949. The total income to date from this license is less than $4,000.

AERONCA MANUFACTURING CORP.

Number of R. & D. contracts: Nine.
Dollar value of R. & D. contracts: $258,992.
Expenditure of company funds for research: $884,916.
Percentage of sales to the Government: 98.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: Six.
Number of these applications which have resulted in patents: Four.
Number of these applications still pending: Two.
Commercial use: None.

AERONUTRONIC SYSTEMS, INC.

(This company commenced operations in July 1956 and is now a division of the Ford Motor Co.)

Number of R. & D. contracts: 46 contracts were awarded to Aeronutronic Systems, Inc., from the date of its founding on July 1, 1956.
Dollar volume of R. & D. contracts: $23,900,000.
Expenditure of company funds for research: Total expenditures $700,000.
Percentage of sales to the Government: 99.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: Nine.
Number of these applications which have resulted in patents: One.
Number of these applications still pending: Eight.
Commercial use: None.

AIRBORNE INSTRUMENTS LABORATORY

Number of R. & D. contracts: 400 (estimation of DOD cost-plus-fixed-fee contracts).

Dollar volume of R. & D. contracts: $67,800,000 (estimation of DOD cost-plus-fixed-fee contracts).

Expenditure of company funds for research: Research and development expenditures were either paid for in their entirety by a customer or charged to the initial run of proprietary products offered as shelf items.

Percentage of sales to the Government: 90.

Number of patent applications filed by the contractor: 13.

Number of these applications which have resulted in patents: 10.

Number of these applications still pending: Three.

Total number of patent applications filed by this firm: 35.

Number of these applications which have resulted in patents: 20.

Number of these applications still pending: 15.

Commercial use: Of the 10 patents issued to Airborne Instruments Laboratory as a result of R. & D. DOD contracts, only 1 has enjoyed an appreciable commercial market. This patent covers a coaxial noise generator, with approximate sales of $200,000.

AIR LOGISTICS CORP.

(Air Logistics Corp. was established in March 1955)

Number of R. & D. contracts: 2.

Dollar volume of R. & D. contracts: $100,000.

Expenditure of company funds for research: $2,500,000.

Percentage of sales to the Government: 90.

Number of patent applications filed by the contractor: None. The contracts awarded Air Logistics have been for the purpose of studying applications of existing company proprietary products.

Number of these applications which have resulted in patents: None.

Number of these applications still pending: None.

Total number of patent applications filed by this firm: 40.

Number of these applications which have resulted in patents: 18.

Number of these applications still pending: 15.

Commercial use: None.

ALL AMERICAN ENGINEERING CO.

Number of R. & D. contracts: Information not available.

Dollar volume of R. & D. contracts: $25,600,000.

Expenditure of company funds for research: $148,000.

Percentage of sales to the Government: 96.4.

Number of patent applications filed by the contractor: 65.

Number of these applications which have resulted in patents: 44.

Number of these applications still pending: 21.

Total number of patent applications filed by this firm: Information not available.

Number of these applications which have resulted in patents: Information not available.

Number of these applications still pending: Information not available.

Commercial use: None. However, the AEE catapult and runway arresting barriers show considerable promise of commercial applications.

AMERICAN BOSCH ARMA CORP.

Number of R. & D. contracts: 57.
Dollar value of R. & D. contracts: $198,302,000.
Expenditure of company funds for research: $1,854,000.
Percentage of sales to the Government: 66.
Number of patent applications filed by the contractor: 55.
Number of these applications which have resulted in patents: 20.
Number of these applications still pending: 31.
Total number of patent applications filed by this firm: 262.
Number of these applications which have resulted in patents: 105.
Number of these applications still pending: 103.

Commercial use: The only commercial product on which patents obtained through Government contracts has any effect is the subminiature gyro compass. While some of the knowledge was obtained during R. & D. contracts, the company spent over $1 million in its development. It is licensed to S. G. Brown, Ltd., of Watford, England, and A.O.I.P. of Paris, France. Less than $100,000 of sales resulted from R. & D. contracts.

AMERICAN MACHINE & FOUNDRY CO.

Number of R. & D. contracts: 243.
Dollar volume of R. & D. contracts: $86,300,000.
Expenditure of company funds for Research: $44 million.
Percentage of sales to the Government: Sales to the Government have ranged from a high of 55 percent to a low of 18 percent.
Number of patent applications filed by the contractor: 22.
Number of these applications which have resulted in patents: 10.
Number of these applications still pending: 12.
Total number of patent applications filed by this firm: 496.
Number of these applications which have resulted in patents: 307.
Number of these applications still pending: 138.
Commercial use: None.

AMERICAN-STANDARD

(This data does not include the Military Products Division, which was sold in 1959 to Northrop)

Number of R. & D. contracts: 17.
Dollar volume of R. & D. contracts: $4,800,000.
Expenditure of company funds for research: $30,400,000.
Percentage of sales to the Government: 5.
Number of patent applications filed by the contractor: 5.
Number of these applications which have resulted in patents: 4.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: 420.
Number of these applications which have resulted in patents: 195.
Number of these applications still pending: 124.

Commercial use: In the past, but not at the present time, cylinders and tubes have been manufactured under processes developed in part through R. & D. work. The approximate annual sales from these contracts during the fiscal years 1949–58 were $5,700,000.

ATLANTIC RESEARCH CORP.

Number of R. & D. contracts: 189.
Dollar value of R. & D. contracts: $13,681,244.
Expenditure of company funds for research: $1,710,315.
Percentage of sales to the Government: 80.
Number of patent applications filed by the contractor: 34.
Number of these applications which have resulted in patents: 13.
Number of these applications still pending: 19.
Total number of patent applications filed by this firm: 12.
Number of these applications which have resulted in patents: One.
Number of these applications still pending: 10.
Commercial use: None.

AVCO CORP.

Number of R. & D. contracts: 102.
Dollar volume of R. & D. contracts: $336,590,866.
Expenditure of company funds for research: $25 million.
Percentage of sales to the Government: 45.
Number of patent applications filed by the contractor: 71.
Number of these applications which have resulted in patents: 25.
Number of these applications still pending: 46.
Total number of patent applications filed by this firm: 299.
Number of these applications which have resulted in patents: 169.
Number of these applications still pending: 94.
Commercial use: None.

BELL AIRCRAFT CORP.

Number of R. & D. contracts: 102.
Dollar value of R. & D. contracts: $69,960,148.
Expenditure of company funds for research: $5,594,989.
Percentage of sales to the Government: 96.3.
Number of patent applications filed by the contractor: 18.
Number of these applications which have resulted in patents: 12.
Number of these applications still pending: Of the 18 applications filed by Bell and the 39 filed by the Government, 41 are still pending.
Total number of patent applications filed by this firm: 99.
Number of these applications which have resulted in patents: 45.
Number of these applications still pending: 47.
Commercial use: Commercial use has been made of only one patent. This patent is for a metal helicopter roto blade which is used in Bell's commercial model helicopter as well as the military model. It is also being made and sold under license in Italy. The only sales, except to the Government, have resulted from the patent for the metal helicopter rotor blade. These sales have been made as part of the price of complete helicopters and no sales figures are available for the blade alone. Licenses have been granted to other aircraft manufacturers for the use of the 12 patents which resulted from DOD

contracts. No royalty income has been received, except in connection with the helicopter blade.

BENDIX CORP.

Number of R. & D. contracts: The various divisions of the Bendix Corp. do not maintain records indicating the number or dollar volume of Department of Defense R. & D. contracts. However, some indication of such contracts is provided by the dollar volume of cost plus fixed fee contracts and their percentage of total sales. The cost plus fixed fee expenditures include prototype and development sample products in addition to pure R. & D.

Year	Cost plus fixed fee contracts	Percent of sales
1957	$91,521,659	12.95
1958	91,613,222	14.80
1959	117,071,352	17.12
1960 (6 months)	73,362,939	18.52

Expenditure of company funds for research: The Bendix Corp. is unable to provide an accurate answer as to the expenditure of private funds for research. The following table indicates gross engineering expenditures, and the percentage of those expenditures which represents reimbursed engineering expenditures. The reimbursed engineering percentages include all engineering contract reimbursements received from sources outside Bendix, whether public or private, and includes indirect as well as direct Government expenditures. It is assumed that the portion of reimbursed engineering which does not involve either direct or indirect Government contracts is quite small. The reimbursed engineering percentages include the total contract amounts, which often involve hardware and other items over and above pure engineering costs.

Bendix fiscal year	Gross engineering expenditures	Reimbursed engineering expenditures (approximate percentages)	Bendix fiscal year	Gross engineering expenditures	Reimbursed engineering expenditures (approximate percentages)
1949	$21,000,000	48	1955	82,000,000	51
1950	24,000,000	53	1956	90,000,000	51
1951	36,600,000	51	1957	97,000,000	45
1952	50,000,000	50	1958	97,000,000	50
1953	70,000,000	59	1959	120,000,000	54
1954	81,000,000	56			

Percentage of sales to the Government: In recent years the percentage of sales to the Government has ranged from a high of 43 percent to a low of 32 percent.

Number of patent applications filed by the contractor: 287.

Number of these applications which have resulted in patents: Bendix estimates that a very high percentage (probably over 80 percent) have resulted in patents.

Total number of patent applications filed by this firm: 2,725.

Number of these applications which have resulted in patents: 2,439.

Commercial use: The Scintilla Division of Bendix reports some commercial use of the following patents, but has no information as to annual sales.

Patent No.	*Product*
2,564,832	Circuit breaker.
2,571,774	S type magneto (this product is dominated by patent No. 2,648,791, which is not licensed to the Government).
2,552,609	Magneto and ignition distributor for Pratt & Whitney 28-cylinder engines.
2,552,610	Same as for No. 2,552,609.
2,651,298	Igniter plugs (commercial sales doubtful).
2,630,462	Magneto.

No licenses have been granted to third parties.

The Eclipse-Pioneer Division reports that several companies are manufacturing altimeters which appear to embody the invention of Bendix-owned patent No. 2,657,350 for altitude controller units. The invention was made under a R. & D. contract. One of the companies manufacturing altimeters is Bulova Research & Development, Inc. When Bendix approached Bulova as to taking a license under the patent, Bulova indicated that their commercial sales were negligible and that they had no need of a license.

BOEING AIRPLANE CO.

Number of R. & D. contracts: 76.

Dollar volume of R. & D. contracts: $76,635,361.

Expenditure of company funds for research: $68,057,238.

Percentage of sales to Government: 94.5.

Number of patent applications filed by the contractor: 27.

Number of these applications which have resulted in patents: 23.

Number of these applications still pending: Three.

Total number of patent applications filed by this firm: In excess of 324. This total does not include applications filed but abandoned.

Number of these applications which have resulted in patents: 229.

Number of these applications still pending: 95.

Commercial use: No identifiable product arising out of patents resulting from R. & D. contracts has obtained commercial use. However, it is possible that some of the inventions have been incorporated in commercial aircraft. Boeing recently formed a special division to make use of research discoveries which have potential commercial application. Boeing said it already has listed more than 250 products or processes for the new division. Boeing also plans to broaden the scope of its oversea sales activities in commercial and military fields.

Of the above-mentioned 250 products and processes, Boeing has supplied the subcommittee with information as to the origin of 194 of these products and processes. Boeing states that information as to the origin of the remaining products and processes is not readily available. The 194 products and processes may be grouped into the following four categories as to origin:

(*a*) There were five products or processes that resulted from DOD R. & D. contracts.

(*b*) There were 27 products or processes that resulted from DOD contracts, not labeled as R. & D., but which did involve R. & D. work.

(*c*) There were 15 products or processes that resulted from DOD contracts, which did not involve R. & D. work.

(*d*) There were 147 products or processes that resulted from "privately financed research." Much of Boeing's general research is allocated as overhead to Boeing's military and commercial business.

The 194 products or processes break down into the following categories:

Electronics	32
Electrical equipment	20
Sensing devices	20
Engines	10
Mechanical and structural equipment	24
Tools	25
Small hardware	7
Hydraulic and pneumatic systems	13
Wind tunnel apparatus	7
Processes	17
Miscellaneous	19

BROWN ENGINEERING CO.

Dollar volume of R. & D. contracts: $8,789,213.
Expenditure of company funds for research: None.
Percentage of sales to Government: 87.5.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Commercial use: None.

CHRYSLER CORP.

Number of R. & D. contracts: 71.
Dollar volume of R. & D. contracts: $97 million.
Expenditure of company funds for research: $447 million.
Percentage of sales to the Government: 8.5.
Number of patent applications filed by the contractor: 19.
Number of these applications which have resulted in patents: 12.
Number of these applications still pending: three.
Total number of patent applications filed by this firm: 594.
Number of these applications which have resulted in patents: 330.
Number of these applications still pending: 169.
Commercial use: Of the 12 patents resulting from DOD contracts, only two have enjoyed commercial use. Both of these patents relate to welding machines and methods. Air Reduction Co. acquired certain rights under one of the patents for a total payment of $1,500 and Sciaky Bros, Inc., acquired license rights under the other patent. Sciaky Bros. have paid approximately $2,500 in royalties. These patents are being used in both defense and commercial work of these companies.

CLEVITE CORP.

Number of R. & D. contracts: 82.
Dollar volume of R. & D. contracts: $15,454,000.
Expenditure of company funds for research: $27,033,000.
Percentage of sales to the Government: Insofar as R. & D. sales are concerned the percentage is 2.4 percent.
Number of patent applications filed by the contractor: 42.
Number of these applications which have resulted in patents: 28.
Number of these applications still pending: 14.
Total number of patent applications filed by this firm: 309.
Number of these applications which have resulted in patents: 127.
Number of these applications still pending: 112.
Commercial use: Commercial use was had of a patent relating to a magnetic transducer head. The expense of this use by Clevite was not very great and it presently is not being used. Another patent deals with a piezoelectric ceramic material which Clevite is selling at the rate of about $30,000 per year to non-Government customers. It is believed that there is considerable potential in the use of piezoelectric materials for accoustical devices. A patent for nickel-cobalt magnetic plating for magnetic recorders was used during World War II by Clevite and this patent is licensed to several companies who are making limited use of the invention. The patent covering the plating for magnetic recorders has been licensed to third parties and Clevite has received approximately $28,000 in royalty income. Clevite is in the process of licensing a company to grow quartz crystals commercially under processes developed during R. & D. contracts.

COLLINS RADIO CO.

Number of R. & D. contracts: 192.
Dollar volume of R. & D. contracts: $110 million.
Expenditure of company funds for research: $35 million.
Percentage of sales to the Government: 84.
Number of patent applications filed by the contractor: 215.
Number of these applications which have resulted in patents: 131.
Number of these applications still pending: 65.
Total number of patent applications filed by this firm: From 1949 to 1959 Collins Co. filed 488 patent applications which resulted from the company's independent research.
Number of these applications which have resulted in patents: 296.
Number of these applications still pending: 87.
Commercial use: The Collins Co. is not able to make any exact analysis as to the incorporation of inventions resulting from R. & D. contracts in commercial equipment. Since a substantial portion of its R. & D. work for the Government was to modify or adopt previous designs or incorporate principles already developed into equipment suitable for military use, it is believed that the extent to which commercial use has been made of the resulting patents is nominal.

COMPUTER CONTROL CO., INC.

Number of R. & D. contracts: Information not available.
Dollar volume of R. & D. contracts: $2,074,589.
Expenditure of company funds for research: $362,383.
Percentage of sales to the Government: 95.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: Six.
Number of these applications which have resulted in patents: One.
Number of these applications still pending: None.
Commercial use: None.

CONTINENTAL AVIATION & ENGINEERING CORP.

Number of R. & D. contracts: 65.
Dollar volume of R. & D. contracts: $51,781,838.
Expenditure of company funds for research: $3,143,766.
Percentage of sales to the Government: 100.
Number of patent applications filed by the contractor: 38.
Number of these applications which have resulted in patents: 19.
Number of these applications still pending: 16.
Total number of patent applications filed by this firm: 38.
Number of these applications which have resulted in patents: 19.
Number of these applications still pending: 15.
Commercial use: None.

CONTINENTAL ELECTRONICS

(A subsidiary of Ling Temco Electronics, Inc.)

Number of R. & D. contracts: 50.
Dollar volume of R. & D. contracts: $30 million.
Expenditure of company funds for research: $500,000.
Percentage of sales to the Government: 90.
Number of patent applications filed by the contractor: One.
Number of these applications which have resulted in patents: One.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: 11.
Number of these applications which have resulted in patents: Six.
Number of these applications still pending: Three.
Commercial use: None.

COOK ELECTRIC CO.

Number of R. & D. contracts: 299.
Dollar volume of R. & D. contracts: $44 million.
Expenditure of company funds for research: $500,000.
Percentage of sales to the Government: 60 percent.
Number of patent applications filed by the contractor: From 1954 through 1959, 40 applications were filed.
Number of these applications which have resulted in patents: 14.
Number of these applications still pending: Information not available.

Total number of patent applications filed by this firm: From 1954 through 1959, 100 patent applications were filed.

Number of these applications which have resulted in patents: 35.

Number of these applications still pending: Information not available.

Commercial use: None.

CURTISS-WRIGHT CORP.

Number of R. & D. contracts: From July 1, 1954, to June 30, 1959, 163.

Dollar volume of R. & D. contracts: $135,935,250.

Expenditure of company funds for research: During the 5-year period the expenditure of private funds amounted to $33,591,260.

Percentage of sales to the Government: 71.3 percent.

Number of patent applications filed by the contractor: 73.

Number of these applications which have resulted in patents: 20.

Number of these applications still pending: 38.

Total number of patent applications filed by this firm: 404.

Number of these applications which have resulted in patents: 132.

Number of these applications still pending: 202.

Commercial use: None.

DOUGLAS AIRCRAFT CO.

Number of R. & D. contracts: 81.

Dollar volume of R. & D. contracts: $31,468,253. This total does not take into consideration a large dollar volume of design work accomplished under production contracts for aircraft and weapons systems.

Expenditure of company funds for research: $31,742,990. This total does not include large sums spent for development of Douglas commercial airplanes.

Percentage of sales to the Government: During recent years the percentage of sales to the Government has ranged from a high of 88 percent to a low of 68 percent.

Number of patent applications filed by the contractor: 19.

Number of these applications which have resulted in patents: 12.

Number of these applications still pending: Six.

Total number of patent applications filed by this firm: 232.

Number of these applications which have resulted in patents: 99.

Number of these applications still pending: 66.

Commercial use: None. The following licenses were granted:

Product	Licensee	Licensee's sales volume	Royalty to Douglas
Scoring camera	Chicago Aerial Industries	$87,500	$4,375
Windshield wiper blade	Marquette Metals Products	23,116	693

NOTE.—Douglas recently organized Astropower, Inc., in which it owns a controlling interest to conduct research on propulsion systems for space vehicles. Projects will include research and development of ultra-high energy propulsion systems in the nuclear, chemical, and electrical fields. Douglas is the prime contractor for the Thor and Sky Bolt ballistic missiles.

EASTMAN KODAK

Number of R. & D. contracts: 99.
Dollar volume of R. & D. contracts: $69,496,301.
Expenditure of company funds for research: $324,023,000.
Percentage of sales to the Government: 4.5.
Number of patent applications filed by the contractor: 40.
Number of these applications which have resulted in patents: 14.
Number of these applications still pending: 25.
Total number of patent applications filed by this firm: 2,773.
Number of these applications which have resulted in patents: 1,700.
Number of these applications still pending: 788.
Commercial use: Eastman Kodak has made no significant commercial use of any of the patents resulting from DOD contracts. Commercial sales under two of the patents amounted to $20,000 in 1959. Eight of the patents have been licensed to others, but no royalty income has been received.

EMERSON ELECTRIC MANUFACTURING CO.

Number of R. & D. contracts: 51.
Dollar volume of R. & D. contracts: $13,500,000.
Expenditure of company funds for research: $5,100,000.
Percentage of sales to the Government: 36.
Number of patent applications filed by the contractor: 11.
Number of these applications which have resulted in patents: Three.
Number of these applications still pending: Two.
Total number of patent applications filed by this firm: 29 applications were filed by the Electrical Division.
Number of these applications which have resulted in patents: 15.
Number of these applications still pending: Eight.
Commercial use: None.

FAIRCHILD CAMERA & INSTRUMENT CORP.

Number of R. & D. contracts: Information not available.
Percentage of sales to the Government: Fairchild's business is predominantly with the Government with the exception of recent ventures into the retail camera field and in the semiconductor and graphic arts field.
Number of patent applications filed by the contractor: 27.
Number of these applications which have resulted in patents: Five.
Number of these applications still pending: 11.
Total number of patent applications filed by this firm: 138.
Number of these applications which have resulted in patents: 82.
Number of these applications still pending: 52.
Commercial use: Information is not available because the commercial apparatus manufactured by Fairchild is quite different from items subject to R. & D. contracts for the Government.

FAIRCHILD ENGINE & AIRPLANE CORP.

Number of R. & D. contracts: 29.
Dollar volume of R. & D. contracts: $86,653,039.
Expenditure of company funds for research: $13,308,508.

Percentage of sales to the Government: Government sales have ranged from 100 percent of sales between 1949 and 1954 to 65 percent of sales in 1959.

Number of patent applications filed by the contractor: 17.

Number of these applications which have resulted in patents: 11.

Number of these applications still pending: Five.

Total number of patent applications filed by this firm: 43.

Number of these applications which have resulted in patents: 25.

Number of these applications still pending: 17.

Commercial use: None.

NOTE.—Fairchild has been losing substantial sums on its F–27 turboprop commercial transport and has been hurt by cancellation of military projects such as the Goose missile and a program for a lightweight small jet engine. Efforts to diversify into aluminum rifles, highway bridges and boats have not restored earning power.

THE GARRETT CORP.

Number of R. & D. contracts: 52.

Dollar volume of R. & D. contracts: $12,886,618.

Expenditure of company funds for research: $10,776,040.

Percentage of sales to the Government: 79.

Number of patent applications filed by the contractor: 25. An additional three applications were filed as the result of subcontracts.

Number of these applications which have resulted in patents: 18.

Number of these applications still pending: Eight.

Total number of patent applications filed by this firm: 337. Most of the R. & D. funds provided by the Government were awarded for the development of a single product line, gas turbines. Most of Garrett's private funds were expended in furthering the state of the art in other fields where it has an established commercial position, such as cabin pressure controls, air-conditioning equipment, heat exchangers, electro-mechanical actuators, etc.

Number of these applications which have resulted in patents: 149.

Number of these applications still pending: 166.

Commercial use: Three of the 18 patents which resulted from R. & D. cover inventions related to products which are now in commercial use. The inventions claimed in the three patents relate to improvements in gas turbine compressors and all of the inventions are used simultaneously on similar products currently being produced by the Garret Corp. for commercial use. Specifically, the patents relate to improvements in the ducting and the drive shaft of the gas turbine compressors, to an improved inlet scroll, and to an improved exducer structure on the turbine wheel. No new product per se arose out of these patents. No license has been granted to third parties on any of the patents which resulted from Government research and development contracts.

As of June 30, 1959, the inventions covered by the above-noted three patents have been used on 169 gas turbine compressors which were sold for commercial use. Two of the 169 units were sold during the fiscal year ending June 30, 1958, while the other 167 units were sold during the fiscal year ending June 30, 1959. The improved elements covered by the patents were not sold as individual items and there is, therefore, no sales record for these elements.

GENERAL ELECTRIC

Number of R. & D. contracts: 823 contracts and subcontracts, in excess of $100,000.

Dollar volume of R. & D. contracts: Many of these 823 contracts were primarily production, with only a minor research and development aspect. It is estimated that the R. & D. content of the procurement involved $1.5 billion for the period January 1, 1950, through December 31, 1959. The aggregate sales value of the contracts and subcontracts (including both production and R. & D. aspects) total approximately $6,200 million.

Expenditure of company funds for research: $1,370 million.

Percentage of sales to the Government: 25.

Number of patent applications filed by the contractor: 804.

Number of these applications which have resulted in patents: 471.

Number of these applications still pending: 258.

Total number of patent applications filed by this firm: 8,957.

Number of these applications which have resulted in patents: 5,660.

Number of these applications still pending: 1,900.

Commercial use: Commercial use is known to have been made by General Electric of 40 of the 471 patents which resulted from R. & D. contracts. In addition, there are a few patents, particularly patents pertaining to electronic circuitry, which have been commercially used but which it has been unable to identify. Military use is known to have been made of 222 of the 471 patents.

The GE Co. has cross-license agreements in certain electronics fields with RCA, Westinghouse, Sylvania, Western Electric, Raytheon, and Philco, and it is estimated that about 188 of the 471 patents fall under one or more of these agreements. In general, the patents affected by these agreements have been placed on the register of the U.S. Patent Office as available for licensing to others upon reasonable terms. One patent has been licensed individually without royalty as a result of an interference settlement. The GE Co. is not aware of any royalty income received by them from licenses granted with respect to any of the 471 patents.

Extent of commercial use of U.S. patents granted upon applications filed by General Electric Co. and resulting from Department of Defense research and development contracts

Patented items	U.S. patent No.	Years from first sale to date	Approximate average annual volume [1] of patented items sold commercially	Approximate average annual dollars [1] of patented items sold commercially
I. Industrial equipment:				
Circuit breakers:				
1. Contact assembly for K-173 circuit breaker	2,596,506	8	150	5,000
2. Reverse current trip for AH-23 circuit breaker	2,575,127	11	100	25,000
Capacitors (electrolytic):				
3. Method of forming oxide film	2,739,110	4	[2] 173,434	177,564
4. Method of etching tantalum	2,863,811	2	[2] 157,900	206,523
Miscellaneous:				
5. Stem-sealed trip throttle for turbines	2,663,318	11	125	75,000
6. Armature construction for alternator exciter	2,652,507	9	20	15,000
7. Additive for silicone oil	2,937,994	3	[3] 1,400	7,500
Total, industrial apparatus				511,587
II. Jet-engine equipment:				
CJ-805 engine:				
8. Compressor stator assembly	2,842,305	2	[4] 97	166,000
9. Variable stator mechanism	2,858,062	2	[4] 97	84,600
10. Locking pipe coupling	2,894,768	2	[4] 97	30,400
11. Turbomachine blading	2,912,222	2	[5] 98,500	945,000
CT-58 engine:				
12. Compressor deicer	2,718,350	1	[4] 28	113,094
13. Compressor stator assembly	2,718,156	1	[4] 28	431,000
14. Power turbine and takeoff construction	2,912,823	1	[4] 28	41,175
15. Locking arrangement for compressor rotor blades	2,931,625	1	[4] 28	79,200
16. Combustion chamber	2,933,895	1	[4] 28	12,060
17. Variable stator compressor assembly	2,936,108	1	[4] 28	4,400
CJ-805 and CT-58 engines:				
18. High-temperature nickel base alloy	2,747,993	2	[3] 23,500	79,000
19. Variable stator engine construction	2,931,168	2	[4] 125	1,235,000
Miscellaneous jet-engine parts:				
20. Nickel brazing alloy	2,923,621	2	[3] 250	2,500
21. Supercharger turbine wheels	2,629,923	11	400	770,800
Total, jet-engine equipment				3,994,229
III. Electronic tubes:				
GL-6299 type:				
22. Cathode assembly	2,680,824			
23. Bonding method	2,792,271			
24. Gettering method	2,838,708	3	3,530	147,000
25. Construction details	2,859,371			
26. Tube assembly	2,910,338			
Lighthouse type:				
27. Filament tester	[6] 2,756,588	3	6,140	166,000
Voltage tuned magnetron type:				
28. Injection electrode	2,810,096	3	1	75
29. Metallic bonding	2,857,663			
Klystron type:				
30. Spacer joint	2,792,241	3	320	20,000
Electron beam type:				
31. Resonator for synchrotron	2,579,315	11	0.1	2,500
32. Electrodes for synchrotron	2,640,923	7	0.14	2,000
33. Ion pump cathode structure	2,755,014	3	17	85
Total electronic tubes				337,660

See footnotes at end of table.

Extent of commercial use of U.S. patents granted upon applications filed by General Electric Co. and resulting from Department of Defense research and development contracts—Continued

Patented items	U.S. patent No.	Years from first sale to date	Approximate average annual volume [1] of patented items sold commercially	Approximate average annual dollars [1] of patented items sold commercially
IV. Semiconductor devices: [7]				
Unijunction transistor:				
34. Constructional arrangement	2,769,926	4	157,000	466,000
35. Electrode structure and arrangement	2,907,934			
Semiconductor rectifier:				
36. Mounting arrangement	2,861,226	4	42,300	329,000
Total semiconductor devices				795,000
V. Miscellaneous electronic equipment:				
37. Gained coaxial switch for T-R system	2,516,616	10	2	500
38. Dual frequency radar antenna	2,719,230	4	10	4,000
39. Leveling pickoff for directional gyro	2,662,411	1	35	900
40. Portable X-ray power supply	2,756,368	9	2	1,171
Total				6,571
Grand total				5,645,047

[1] Average annual volume and dollars computed by dividing total sales by the number of years from the date of first sale to present date.
[2] Square feet.
[3] Pounds.
[4] Engines.
[5] Blades.
[6] This patent 2,756,588 also used in GC-6299 type tubes.
[7] One other semiconductor patent 2,882,462, Zierdt, arising out of a DOD contract, relates to a detail of the mounting arrangement of alloy junction transistors which are also covered by basic patent applications S.N. 596,943-Hall and S.N. 603,532-Saby arising out of GE sponsored research. This Zierdt patent 2,882,462 has been placed in interference with a patent application of the Sylvania Electric Products Division of General Telephone Corp., which is the senior party. In view of uncertainty as to outcome, the patent has not been included in the present tabulation.

GENERAL MOTORS

Number of R. & D. contracts: GM received 291 prime contracts and 146 subcontracts.

Dollar volume of R. & D. contracts: The value of the prime contracts was $290,985,307 and the value of the subcontracts was $43,108,714.

Expenditure of company funds for research: $1,646,946,000.

Percentage of sales to the Government: The percentage of sales to the Government has ranged from a high of 16 percent to a low of 2 percent. The average percentage of sales to the Government for the 10-year period is 7.9 percent.

Number of patent applications filed by the contractor: 447.

Number of these applications which have resulted in patents: 265.

Number of these applications still pending: 140.

Total number of patent applications filed by this firm: 6,610.

Number of these applications which have resulted in patents: 4,077.

Number of these applications still pending: 1,810.

Commercial use: The following table lists the patents used in commercial production which had issued as of May 1, 1960, on the patent applications filed by General Motors Corp. during the period July 1, 1949, to June 30, 1959, on inventions made in performing Department of Defense contracts containing a "Patent rights" article. It should be noted that the patents cover but a relatively small part of the product sold.

Patent	*Using product*
(1) 2,609,799—System for lubrication of slipper type connecting rod and piston pin bearings and for jet cooling of pistons.	Gas engines.
(2) 2,681,838—Removable bearing insert for a slipper type connecting rod bearing.	Do.
(3) 2,786,538—Hollow propeller blade having rib provided with contoured fillets terminating in knife edges.	Aircraft propellers.
(4) 2,550,529—Hydraulic control system for varying pitch of propeller blades.	Do.
(5) 2,626,668—Auxiliary power system for turning propeller blades into and out of feather position.	Do.
(6) 2,626,669—Hydraulic control system for varying pitch of propeller blades using relatively low pressure to control high pressure source.	Do.
(7) 2,699,304—Fluid pressure control system for varying blade pitch of a plurality of counterrotating propellers.	Do.
(8) 2,745,500—Fluid pressure control system for varying pitch of propeller blades using relatively low pressure to control high pressure source.	Do.
(9) 2,761,519—Improved rotary feedback mechanism in propeller control for greater feedback travel per degree blade angle movement.	Do.
(10) 2,798,563—Dual low pitch stop mechanism for propellers.	Do.
(11) 2,630,136—Control valve for high frequency operation and varying port size.	Do.
(12) 2,669,312—Speed control mechanism for rapid and sensitive propeller pitch regulation to minimize engine overspeed and underspeed.	Do.
(13) 2,891,627—Heat exchange reservoir formed in the propeller hub for cooling regulator oil.	Do.
(14) 2,734,587—Improved torque unit for varying blade pitch.	Do.
(15) 2,640,679—Improved stator ring and seal construction for gas turbine engines.	Aircraft gas turbine engines.
(16) 2,675,174—Mechanism for locking together and sealing the rotor wheels of an axial flow gas turbine engine.	Do.
(17) 2,737,018—Propeller brake system for use with gas turbine engines.	Do.
(18) 2,763,462—Casing construction for gas turbine engines.	Do.
(19) 2,766,963—Mechanism for forming a locked stator assembly for gas turbine engines.	Do.

	Patent	*Using product*
(20)	2,778,241—Mechanism for selectively interconnecting an output shaft with either 1 of 2 input shafts.	Aircraft gas turbine engines.
(21)	2,786,667—Speed responsive control device for actuating series of switches.	Do.
(22)	2,796,139—Mechanism for locking a thrust nut on a rotating shaft.	Do.
(23)	2,797,812—Self-cleaning fuel filter.	Do.
(24)	2,856,674—Electrical connectors for separable interconnection in wiring harness.	Do.
(25)	2,860,712—Pilot control linkage for engine and propeller.	Do.
(26)	2,860,713—Power transmission system using overrunning clutch.	Do.
(27)	2,870,633—Heated pressure-probe for compressor air inlet.	Do.
(28)	2,893,495—Mechanism to uncouple failed engine from propeller.	Do.
(29)	2,806,075—Thermocouple for gas turbine engines.	Do.
(30)	2,836,987—Mechanism for selectively interconnecting a control shaft with 1 of 2 input shafts.	Do.
(31)	2,862,355—Starting fuel system for gas turbine engines.	Do.
(32)	2,718,756—Mounting and supporting structure for aircraft gas turbine powerplants having reduction gearing.	Do.
(33)	2,761,387—Fuel pumping system for gas turbine engines.	Do.
(34)	2,898,442—Assembly of compressor vanes in stator rings.	Do.
(35)	2,627,188—Adjustable crank arm for engine power control.	Do.
(36)	8,800,273—De-icing system for compressor air inlet.	Do.
(37)	2,826,255—Propeller braking system.	Do.
(38)	2,876,116—Electroless nickel plating.	Do.
(39)	2,433,052—Compound power automatic transmission.	Transmission.
(40)	2,699,074—Improved automatic control system for transmissions.	Do.
(41)	2,899,846—Automatic transmission.	Do.

The approximate annual sales by volume and dollars of each patented item which resulted from Government research and development contracts: The following table lists the annual sales by General Motors Corp. of each "Using product" containing one or more of the patented features covered by the patents listed. The sales listed are not of the patented items by themselves but are of the "Using product" of which the patented items are only small parts, such as gas engines containing the bearing insert of patent 2,681,838. The following table lists the total annual sales by number of units and by total dollar value:

Annual sales of each using product

Period	Gas engines		Aircraft propellers		Aircraft gas turbine engines		Transmissions	
	Number of units	Value	Number of units	Value	Number of units	Value	Number of units	Value
1949 (last half)	None	None	None	None	None	None	None	None
1950	None	None	None	None	None	None	None	None
1951	None	None	None	None	None	None	None	None
1952	41	$4,363,492	None	None	None	None	None	None
1953	None	None	None	None	None	None	None	None
1954	1	106,427	None	None	None	None	40	$94,000.00
1955	None	None	None	None	None	None	541	1,201,752.00
1956	5	618,419	None	None	None	None	2,453	3,247,816.80
1957	None	None	None	None	4	$345,598	2,770	3,305,273.25
1958	1	123,684	207	$5,186,717	236	20,803,254	3,383	5,210,405.65
1959 (1st half)	None	None	218	5,403,882	293	26,195,945	2,754	5,309,280.95

Four of the patents which had issued as of May 1, 1960, on the patent applications filed by General Motors Corp. during the period July 1, 1949, to June 30, 1959, on inventions made in performing Department of Defense contracts containing a "Patent rights" article have been licensed to third parties. Each license is on a royalty-free basis and no royalty income has been received.

GENERAL PRECISION EQUIPMENT CORP.

(General Precision is the parent of Librascope, Inc., and Link Aviation Inc.)

Number of R. & D. contracts: The various subsidiaries of General Precision are unable to provide information as to the number and dollar volume of R. & D. contracts.

Percentage of sales to the Government: The percentage of sales for Government end-use, whether under prime contracts or subcontracts, has fluctuated during the period 1949–59. From 1949 to 1952, total sales of all subsidiaries were in the area of $27 to $30 million and a very small percentage was for Government end-use. By reason of the acquisition of Kearfott Co. in 1952, Link Aviation in 1954, Griscom-Russell in 1955, Shand & Jurs in 1956, and Graflex in 1957, plus growth of existing business, total sales of the subsidiaries of this corporation increased from $54 million for 1952 to $215 million for 1959. During this period sales of products for Government end-use fluctuated between approximately 65 and 75 percent.

Number of patent applications filed by the contractor: Information not supplied.

Total number of patent applications filed by this firm: Several hundred.

Commercial use: No information supplied.

GOODYEAR AIRCRAFT CORP.

Number of R. & D. contracts: 88.
Dollar volume of R. & D. contracts: $116,750,000.
Expenditure of company funds for research: $6,594,000.
Percentage of sales to the Government: 50.
Number of patent applications filed by the contractor: 41.
Number of these applications which have resulted in patents: 16.
Number of these applications still pending: 20.
Total number of patent applications filed by this firm: 68.
Number of these applications which have resulted in patents: 33.
Number of these applications still pending: 24.
Commercial use: None.

GRUMMAN AIRCRAFT ENGINEERING CORP.

Number of R. & D. contracts: 33.
Dollar volume of R. & D. contracts: $80,225,572.
Expenditure of company funds for research: $38,960,360.
Percentage of sales to the Government: 98.6.
Number of patent applications filed by the contractor: Five.
Number of these applications which have resulted in patents: Five.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: 13.
Number of these applications which have resulted in patents: Six.
Number of these applications still pending: Six.

Commercial use: Of the five patents covering inventions resulting from Government research and development contracts, commercial use has been made of the following:

(*a*) A pilot-operated shutoff valve, covered by U.S. Patent No. 2,811,167 and manufactured and sold by the Parker Appliance Co., Cleveland, Ohio, is used on commercial transport aircraft, the extent of which use is not known to Grumman.

(*b*) A self-locking control device covered by U.S. Patent No. 2,867,133 is manufactured and sold by the Aero Supply Manufacturing Corp., Corry, Pa., the extent of which is not known to Grumman.

(*c*) A fastening device covered by U.S. Patent No. 2,936,501 is manufactured and sold by the Elastic Stop Nut Corp. of America, Union, N.J., the extent of which is not known to Grumman.

HAYES AIRCRAFT CORP.

Number of R. & D. contracts: 10.
Dollar volume of R. & D. contracts. $14,664,748.
Expenditure of company funds for research: $944,090.
Percentage of sales to the Government: 93.6.
Number of patent applications filed by the contractor: One.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: One.
Total number of patent applications filed by this firm: Three.
Number of these applications which have resulted in patents: One.
Number of these applications still pending: Two.
Commercial use: None.

HAZELTINE CORP.

Number of R. & D. contracts: 49.
Dollar volume of R. & D. contracts: $50,894,000.
Expenditure of company funds for research: $5,442,000.
Percentage of sales to Government: 95, including subcontracts for Government equipment.
Number of patent applications filed by the contractor: 87.
Number of these applications which have resulted in patents: 77.
Number of these applications still pending: Information not available.
Total number of patent applications filed by this firm: 378.
Number of these applications which have resulted in patents: 259.
Number of these applications still pending: 104.
Commercial use: This information is not available since Hazeltine does not itself manufacture commerical apparatus and the Hazeltine Research, Inc., which owns the patents and grants licenses in general, grants licenses under all of its patents as a group and receives no reports showing the extent of use of any individual patent.

HERCULES POWDER CO.

Number of R. & D. contracts: 27.
Dollar volume of R. & D. contracts: $19,610,686.
Expenditure of company funds for research: $82,877,000.
Percentage of sales to the Government: 3.7.
Number of patent applications filed by the contractor: 24.
Number of these applications which have resulted in patents: Five.
Number of these applications still pending: Information not available.
Total number of patent applications filed by this firm: 947.
Number of these applications which have resulted in patents: 467.
Number of these applications still pending: 238.
Commercial use: None.

HUGHES AIRCRAFT CO.

Number of R. & D. contracts: 300.
Dollar volume of R. & D. contracts: $800 million.
Expenditure of company funds for research: $28,400,000.
Percentage of sales to the Government: 96.6.
Number of patent applications filed by the contractor: 458.
Number of these applications which have resulted in patents: 174.
Number of these applications still pending: 225.
Total number of patent applications filed by this firm: 943.
Number of these applications which have resulted in patents: 306.
Number of these applications still pending: 434.
Commercial use: Hughes has used commercially four patents which resulted from R. & D. contracts. Three of these are for cathode ray storage tubes, and one is for fused-junction silicon diodes. The sales volume of products incorporating the cathode tubes is 7,424 units, with a dollar value of $10,623,872. The sales volume of products incorporating diodes is 22,487,517 units, with a dollar value of $46,823,847.

The Hughes Co. has granted licenses to third parties under 210 patents, which resulted from R. & D. contracts and has received royalty income in the amount of $1,210.

INTERNATIONAL BUSINESS MACHINES, INC.

Number of R. & D. contracts: 79.

Dollar value of R. & D. contracts: Actual expenditures under these contracts for the 10-year period amounted to $253,653,929. These contracts authorize total expenditures of $396,657,977.

Expenditure of company funds for research: $184,055,064.

Percentage of sales to the Government: 27.3, incldung subcontracts.

Number of patent applications filed by the contractor: 406.

Number of these applications which have resulted in patents: 68 matured into patents.

Number of these applications still pending: 312.

Total number of patent applications filed by this firm: 2,496.

Number of these applications which have resulted in patents: 885 matured.

Number of these applications still pending: 1,469.

Commercial use: Commercial use has been made of patent No. 2,801,-805 which relates to a method and apparatus for winding precision potentiometers. Beckman Instruments, Inc., manufactures and sells potentiometers under this patent.

IBM has received royalty income from Beckman in the sum of $682.09. A majority of the patents resulting from R. & D. contracts are included in cross-license agreements. However, no royalty income has been derived from the agreement.

INTERNATIONAL TELEPHONE & TELEGRAPH CORP.

Number of R. & D. contracts: Somewhat more than 1,200 contracts.

Dollar volume of R. & D. contracts: $265,129,696.

Expenditure of company funds for research: $120,137,000.

Percentage of sales to the Government: 23 percent of ITT's worldwide sales and 63 percent of ITT's U.S. sales.

Number of patent applications filed by the contractor: 321.

Number of these applications which have resulted in patents: 218.

Number of these applications still pending: 92.

Total number of patent applications filed by this firm: 2,710.

Number of these applications which have resulted in patents: 1,258.

Number of these applications still pending: 966.

Commercial use: During the past 5 years (including 1960) approximately $1,004,000 worth of tacan aerial navigation equipment was and will be sold. Prior to 1956 no significant commercial sales of equipment were made involving such patents.

ITT has, through its subsidiary, International Standard Electric Corp., license agreements with foreign subsidiaries and with other foreign companies in connection with which 877 patent applications have been filed abroad, based on 343 applications for patent first filed in the U.S.A. based on inventions arising from Government R. & D. contracts. As part of the consideration for the foreign rights granted, ITT is given U.S. rights to inventions of the licensee companies.

INTERSTATE ELECTRONICS CORP.

Number of R. & D. contracts: 24.
Dollar volume of R. & D. contracts: $14,402,000.
Expenditure of company funds for research: No private funds expended.
Percentage of sales to the Government: 98.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Commercial use: None.

LAND-AIR, INC.

Number of R. & D. contracts: Six.
Dollar volume of R. & D. contracts: $5,522,461.
Expenditure of company funds for research: $3 million.
Percentage of sales to the Government: 85.
Number of patent applications filed by the contractor: One.
Number of these applications which have resulted in patents: One.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: Nine.
Number of these applications which have resulted in patents: Six.
Number of these applications still pending: Two.
Commercial use: None.

R. G. LE TOURNEAU, INC.

Number of R. & D. contracts: 16 (1953–59).
Dollar volume of R. & D. contracts: $4,768,908 (1953–59).
Expenditure of company funds for research: $20 million.
Percentage of sales to the Government: 35.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: 130.
Number of these applications which have resulted in patents: 78.
Number of these applications still pending: 14.
Commercial use: None.

ARTHUR D. LITTLE, INC.

Number of R. & D. contracts: 214.
Dollar volume of R. & D. contracts: $21,920,000.
Expenditure of company funds for research: $68,260,000.
Percentage of sales to the Government: 24.3.
Number of patent applications filed by the contractor: 45.
Number of these applications which have resulted in patents: 14.
Number of these applications still pending: 26.
Total number of patent applications filed by this firm: 280.
Number of these applications which have resulted in patents: 117.
Number of these applications still pending: 163.

Commercial use: Arthur D. Little reports that the patents resulting from R. & D. research have had only a limited commercial application. The firm believes that a small portion of its cryogenic activity and liquid oxygen technology results in part from Government contracts. However, it is pointed out that these contracts were received by Little because of previous developments in these fields made by Little at its own expense.

LITTON INDUSTRIES, INC.

(Litton Industries commenced operations late in 1953)

Number of R. & D. contracts: 95 (1954–59).
Dollar volume of R. & D. contracts: $32,300,000 (1954–59).
Expenditure of company funds for research: $7 million (1954–59).
Percentage of sales to the Government: 16.6.
Number of patent applications filed by the contractor: 51 (this includes applications filed by present subsidiaries of Litton, some of which were in existence prior to 1953).
Number of these applications which have resulted in patents: 29.
Number of these applications still pending: 20.
Total number of patent applications filed by this firm: 435.
Number of these applications which have resulted in patents: 282.
Number of these applications still pending: 112.
Commercial use: A commercial use has been found for a patent which is utilized in the Monrobot IX, which is an electronic invoicing machine. Approximately 34 of these machines have been made and the prorated portion of the total cost of the machine allocatable to the circuit incorporating the feature of the invention is approximately $9,500.

LOCKHEED AIRCRAFT CORP.

Number of R. & D. contracts: 112.
Dollar volume: $282,851,000.
Expenditure of company funds for research: $145 million.
Percentage of sales to the Government: 84.
Number of patent applications filed by the contractor: Seven.
Number of these applications which have resulted in patents: Seven.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: 363.
Number of these applications which have resulted in patents: 214.
Number of these applications still pending: 116.
Commercial use: No recorded commercial use has been made of the patented items as separate products. This, however, does not mean that the company has not utilized the patented items as components in the manufacture and sale of commercial systems.

NOTE.—Missile and spacecraft business accounted for $500 million of sales in the first 9 months of 1960. The company's profitable C–130 turboprop transport program is expected to continue for 10 more years with sales both to the United States and foreign governments. The program for licensing the construction of F–104 Starfighters abroad is growing. A total of $2,250 million is involved, most of it accounted for by foreign production. From this, and income from foreign licensing, Lockheed expects to gross more than $600 million.

The F–104 may also be purchased for the U.S. mutual aid program for European defense. In addition to extensive electronics work in connection with missiles and aircraft, Lockheed has established a wholly-owned subsidiary, Lockheed Electronics Co., which is built around Stavid Engineering, which Lockheed acquired in 1959. Among current Lockheed programs is a Navy contract for a ship-board air search radar system. Its sales for 1960 are estimated at $16 million, of which 90 percent are military. Areas of research include ceramic ferrites, missile tracing devices, radar, checkout simulators, navigation and bombing equipment, guidance, telemetering, data recording, test instrumentation, and antennas.

THE MARQUARDT CORP.

Number of R. & D. contracts: 48.
Dollar volume of R. & D. contracts: $99,524,611.
Expenditure of company funds for research: $103,277.
Percentage of sales to the Government: Approximately 100, exclusive of overhead application.
Number of patent applications filed by the contractor: 26.
Number of these applications which have resulted in patents: Five.
Number of these applications still pending: 15.
Total number of patent applications filed by this firm: 49.
Number of these applications which have resulted in patents: 14.
Number of these applications still pending: 23.
Commercial use: None.

MARTIN CO.

Number of R. & D. contracts: Information not available.
Dollar volume of R. & D. contracts: Total awards for fiscal year 1954–59, $739,254,000 (Department of Defense records).
Expenditure of company funds for research: $9,064,000.
Percentage of sales to the Government: 97.4, for the total 10-year period. But due to Martin's withdrawal from the commercial field, the percentage of Government sales from 1953 to July 30, 1959 exceeded 99.
Number of patent applications filed by the contractor: 120.
Number of these applications which have resulted in patents: 79.
Number of these applications still pending: 41.
Total number of patent applications filed by this firm: 219.
Number of these applications which have resulted in patents: As of September 15, 1960: 121.
Number of these applications still pending: As of September 15, 1960: 98.
Commercial use: Martin withdrew from the commercial field in 1953. Of the 79 patents resulting from Government R. & D. contracts, 42 licenses have been granted to the members of the Manufacturers Aircraft Association pursuant to the amended cross license agreement of 1928. No royalty income has been received from the MAA for their use. Martin also licensed a brazing compound patent to a nonmember of the MAA and has received to date $2,613,000 in royalties for commercial usage. A patent on electronics chassis locking handles was

licensed to a nonmember company, but no royalty income has been derived as its sales have all been for governmental purposes.

NOTE.—In 1959 Martin enjoyed a 13-percent increase in net income and an 8-percent increase in sales over 1958. It was the ninth consecutive year that the company's sales had increased over the year before.

MELPAR, INC.

(A subsidiary of Westinghouse Air Brake Co.)

Number of R. & D. contracts: 291.
Dollar volume of R. & D. contracts: $124,475,000.
Expenditure of company funds for research: None.
Percentage of sales to the Government: Approximately 99 (including sales under Government prime contracts and subcontracts to Government prime contractors).
Number of patent applications filed by the contractor: 30.
Number of these applications which have resulted in patents: 10.
Number of these applications still pending: 18.
Total number of patent applications filed by this firm: 68.
Number of these applications which have resulted in patents: 30.
Number of these applications still pending: 33.
Commercial use: None. No known commercial demand for the type of products covered by the patents. Some of the patent applications are still under secrecy orders and cannot be considered for commercial use. Possible commercial uses of inventions are being explored.

MOTOROLA, INC.

Number of R. & D. contracts: 425.
Dollar volume of R. & D. contracts: $73,100,000.
Expenditure of company funds for research: $53,500,000.
Percentage of sales to the Government: 21.8.
Number of patent applications filed by the contractor: 31.
Number of these applications which have resulted in patents: 12.
Number of these applications still pending: 18.
Total number of patent applications filed by this firm: 572.
Number of these applications which have resulted in patents: 377.
Number of these applications still pending: 141.
Commercial use: No commercial sales. No specific license has been granted under any patent resulting from Government R. & D. contracts. Motorola has broad cross-licensing arrangements with RCA and Western Electric for the Bell System. These licenses include all Motorola-owned patents in existence during the period of the license. In this respect the 12 patents resulting from DOD R. & D. work are included. To Motorola's knowledge there has been no use made of the items of the patents, the patents were never referred to during negotiations, and Motorola has no knowledge that these patents are even known to the licensees.

NORTH AMERICAN AVIATION, INC.

Number of R. & D. contracts: Approximately 325 cost-type contracts.

Dollar volume of R. & D. contracts: Approximately $1,975 million. The total is based on cost-type contracts which exclude expenditures for the construction of facilities but does include research and development and in some instances, production of aircraft, missiles, rocket engines, and other equipment.

Expenditure of company funds for research: Approximately $15 million, excluding company expenditures for research and development facilities, such as approximately $6 million for the trisonic wind tunnel completed in 1957.

Percentage of sales to the Government: Approximately 99.

Number of patent applications filed by the contractor: 391 applications filed, but some of these patent applications resulted from inventions made under similar contracts awarded prior to 1949, and it is expected more applications will be filed subsequent to 1959 on inventions made during the 1949–59 period.

Number of these applications which have resulted in patents: 172.

Number of these applications still pending: 191.

Total number of patent applications filed by this firm: 853.

Number of these applications which have resulted in patents: 366.

Number of these applications still pending: 371.

Commercial use: Commercial use has been made of four of the patents which resulted from DOD research and development contracts.

Patent No.	Product	Manufacturer	Sales
2,898,557	Transistorized voltage controlled oscillator.	The Bendix Corp.	Licensed to the Bendix Corp. Amount of sales by licensee not known.
2,925,013	Rocket engine flame deflector.	MacCallum Steel Corp	Formerly licensed to the MacCallum Steel Corp. Amount of sales by licensee not known.
2,899,260	Magnetic disk recorder	North American Aviation, Inc.	Incorporated into RECOMP digital computer developed and sold by North American. Sales commenced subsequent to June 1948 and as of June 30, 1959, amounted to $1,326,000, with a company investment of approximately $4,000,000.
2,846,517	Magnetic head	do	Do.

Two patents which resulted from DOD R. & D. work have been licensed to third parties. A total of $37,500 has been received under these agreements, covering payments for technical information and assistance, as well as royalties. North American is a member of the Manufacturers Aircraft Association, Inc., under which usable aircraft patents are cross-licensed under royalty-free agreements.

NOTE.—From January 1958 to September 1959, Astrodyne, Inc., was a 50 percent owned subsidiary of North American, the other 50 percent being owned by Phillips Petroleum Co. In September 1959, Astrodyne was merged into North American. From January 1958 to September 1959, Astrodyne's direct and indirect sales to the Government under 10 cost-type contracts, excluding contracts for facilities, totaled approximately $10 million. This includes both R. & D. and

production of solid propellant devices and other equipment. During this same period Astrodyne expended approximately $475,000 of its own funds for R. & D. Approximately 99 percent of Astrodyne's sales were made directly or indirectly to the Government. No patent applications were filed by Astrodyne during this period.

The total sales of North American grew from $635 million in 1933 to more than a billion dollars in 1959. At the start of this period, the aircraft share of dollar volume accounted for 85 percent; at the end of the period, aircraft sales were only 54 percent of the total, yet they had increased by $24 million. During this same 7-year period nonaircraft product sales rose from 15 to 46 percent. North American has diversified into such fields as nuclear reactors, liquid and solid rocket engines, manned and unmanned flight in aerospace, metallurgy, computers and data processing, and electronics.

In 1955 North American organized the Autonetics Division in the field of electronics. North American credits this division with the first successful airborne all-inertial navigation system, the first navigation system accurate enough to guide submarines beneath the polar ice, the first successful automatic star tracking by an inertial navigation system during daytime flight, the first completely maneuverable and inertially stabilized gyro platform, the first successful automatic landing system for supersonic missiles and aircraft, and the first compact all-transistorized digital computer.

Through Autonetics Industrial Products, this division is now marketing a line of compact digital computers for commercial use, and is expanding into the international market with computers, advanced radar systems, and other electronic equipment. In fiscal 1960, net sales for Autonetics amounted to $264,162,496. Autonetics in 1961 entered into a contract with a British firm to sell them $1,500,000 of airborne computers. Though the Autonetics Division of North American has been in existence for only 6 years, today, based on net sales, this division of North American alone would rank among the leading 200 corporations in the United States.

NORTHERN ORDNANCE, INC.

Number of R. & D. contracts: 20.

Dollar volume of R. & D. contracts: $26,365,000 including cost of manufacturing of prototype and experimental units.

Expenditure of company funds for research: $46,897.06.

Percentage of sales to the Government: 97.

Number of patent applications filed by the contractor: Six applications were filed by the Government.

Number of these applications which have resulted in patents: None.

Number of these applications still pending: Six. The company estimates approximately 40-50 additional applications will be filed by the Government resulting from the contracts reported during this period.

Total number of patent applications filed by this firm: Five.

Number of these applications which have resulted in patents: Five.

Number of these applications still pending: None.

Commercial use: None.

NORTHROP CORP.

Number of R. & D. contracts: 158.

Dollar volume of R. & D. contracts: $414,178,814.59.

Expenditure of company funds for research: $10,241,105.06. Figures for the years 1949-50 on expenditures are not available and therefore not included.

Percentage of sales to the Government: Approximately 90.

Number of patent applications filed by the contractor: 361.

Number of these applications which have resulted in patents: 328.

Number of these applications still pending: 33.

Total number of patent applications filed by this firm: 435.

Number of these applications which have resulted in patents: 379.

Number of these applications still pending: 56.

Commercial use: Northrop Corp. made no commercial use of the patents and inventions which resulted from Government R. & D. contracts, other than issuing licenses to others to manufacture and sell. To the extent that sales by the licensee were to the Government, no royalty was charged by Northrop. (In a few isolated instances royalty was charged but was credited to the Government.) The following table shows the products licensed and the royalty income received by Northrop for commercial use on 67 patents resulting from Government research and development contracts during the period 1951–60.

Item No.	Product description	Number of patents	Licensee	Royalty income to May 31, 1960
1	Trionode tube	11	Walkirt Co	$18.75
2	Maddida computer	24	Bendix Aviation Corp	0
3	Incremental motors	15	Stepper Motors Corp	3,574.00
4	Auto memory clutch	2	do	0
5	Jet engine starter system	2	Air Logistics Corp	2,000.00
6	Glass surface generator	1	Keystone Engineering Co	0
7	Counter mechanism	1	Photocon Research Products	5,882.19
8	Breakaway clamp	1	Turbo Products, Inc	2.10
9	Electro hydraulic vibration machine	1	Wyle Manufacturing Corp	0
10	Digital plotter	1	Tally Register Corp	866.25
11	Optical device	1	Luxorb Research & Dev	1,094.80
12	Captive fastener	1	Moran Co	150.18
13	Stepping switch	1	United Electrodynamics, Inc	0
14	Load switching contactor	1	Cole Electric Co	0
15	Trace blocker	1	Northridge Research, Inc	0
16	Component lead former	2	A. G. Barstow Co	120.66
17	Cabinet structure	1	Bonsair Fabricators, Inc	3,000.00
	Total	67		16,708.00

NOTE.—Northrop's financial position has been improved as a result of its conversion from an airframe manufacturer to an organization doing work in 72 different defense programs. Northrop is the sole supplier of the T–38 supersonic trainer, is the only company which has successfully developed a recovery system for the Mercury and Samos satellites, has a major position in the Polaris missile program, and is supplying the guidance system for the Skybolt missile. The company's biggest single program, the Skybolt airborne ballistic missile, accounts for less than 20 percent of sales. Northrop's organization is built around the technical capabilities in such fields as aeronautics, optics, electronics, and guidance rather than around specific projects.

The knowledge Northrop gained from testing various components of the Snark missile and F–89 interceptors enabled it to develop Datico, a "locker" of electronic gear that controls valves, switches, and other components for various weapon systems. Northrop has sold over 40 Daticos to date at basic prices of nearly $500,000 each. Northrop produces Q Ball, the flight angle sensor for safe reentry of X–15 and other aerospace vehicles. Northrop's laminar flow control technique is designed to greatly increase aircraft range, flexibility, cargo and passenger capacity. Northrop supplies complete technical and industrial management to activate the T–a Titan missile base.

Northrop produces airframe components, ground handling and launching equipment for the Hawk air defense missile. Northrop designed the trans-Pacific scatter communications network and other worldwide communication systems for the United States and free world governments. Northrop has produced more than 50,000 electronically controlled aerial targets and surveillance drones.

Northrop is currently developing the guidance system for the Air Force Skybolt missile. Northrop was assigned this project as the result of the capability it developed in the field of stellar monitored guidance systems in the course of its work on the guidance system for the Snark missile. From the present work on the Skybolt missile, the company expects to extend its technical capabilities in the field of space navigation.

Northrop is developing advanced and miniaturized versions of its Datico system, which may have space and commercial applications. The company is acquiring an advanced position in the field of optics-electronics, as the result of its production of navigation periscopes, radiometric sextants, and high-precisioned gyroscopes for the Polaris submarine.

Northrop has developed an astroinertial system, which involves star reference guidance. In the area of rocket propulsion for deep space penetration, Northrop is currently developing two systems, Profac and Heliodyne. Profac is a space refueling station; it collects and stores molecules of air for propulsion of space vehicles in orbit. Heliodyne employs the energy of the sun to heat hydrogen as a lightweight, economical method of propulsion. Concerning plasma dynamics, the company is developing extremely high-temperature plasmas. The company is working on computers, gyroscopes, and accelerometers to control navigation in space.

OLIN MATHIESON CHEMICAL CORP.

(Period Jan. 1, 1955, through Dec. 31, 1959, because 1955 is the first calendar year of existence of Olin Mathieson)

Number of R. & D. contracts: 158.
Dollar volume of R. & D. contracts: $35,767,000.
Expenditure of company funds for research: $65,931,000.
Percentage of sales to the Government: 6.3.
Number of patent applications filed by the contractor: 298.
Number of these applications which have resulted in patents: 44.
Number of these applications still pending: 224.
Total number of patent applications filed by this firm: 1,340.
Number of these applications which have resulted in patents: 436.
Number of these applications still pending: 694.
Commercial use: None.

PAN AMERICAN WORLD AIRWAYS

Number of R. & D. contracts: Eight.
Dollar volume of R. & D. contracts: $206,229,962.
Expenditure of company funds for research: None.
Percentage of sales to the Government: Not applicable.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: Five.
Number of these applications which have resulted in patents: Three.
Number of these applications still pending: One.
Commercial use: None.

PRD ELECTRONICS, INC.

(A subsidiary of Harris-Intertype Corp.)

Number of R. & D. contracts: No information available.
Dollar volume of R. & D. contracts: $10 million.
Expenditure of company funds for research: $650,000.
Percentage of sales to the Government: 50.
Number of patent applications filed by the contractor: 28.
Number of these applications which have resulted in patents: 17.
Number of these applications still pending: Seven.
Total number of patent applications filed by this firm: 28.
Number of these applications which have resulted in patents: 17.
Number of these applications still pending: Seven.
Commercial use: Approximately one-third of gross sales embodies features or equipment covered by the above patents. PRD has granted no licenses to third parties on these patents.

RADIATION, INC.

(Period from inception of this corporation is August 18, 1950, through June 30, 1959)

Number of R. & D. contracts: 150.
Dollar volume of R. & D. contracts: $31,749,000.
Expenditure of company funds for research: $690,000.
Percentage of sales to the Government: 97.
Number of patent applications filed by the contractor: Seven.
Number of these applications which have resulted in patents: Three.
Number of these applications still pending: Four.
Total number of patent applications filed by this firm: 35.
Number of these applications which have resulted in patents: 14.
Number of these applications still pending: 21.
Commercial use: None.

RADIO CORP. OF AMERICA

Number of R. & D. contracts: 566.
Dollar volume of R. & D. contracts: $275,486,000.
Expenditure of company funds for research: $324,406,000.
Percentage of sales to the Government: 20.2.

Number of patent applications filed by the contractor: 244.
Number of these applications which have resulted in patents: 43.
Number of these applications still pending: 119.
Total number of patent applications filed by this firm: 5,513.
Number of these applications which have resulted in patents: 2,635.
Number of these applications still pending: 1,390.
Commercial use: RCA knows of no commercial use which was made of the patents resulting from DOD research and development contracts.

RAYTHEON CO.

Number of R. & D. contracts: 355.
Dollar volume of R. & D. contracts: $325 million.
Expenditure of company funds for research: $38 million.
Percentage of sales to the Government: 59.
Number of patent applications filed by the contractor: 376.
Number of these applications which have resulted in patents: 212.
Number of these applications still pending: 112.
Total number of applications filed by this firm: 1,349.
Number of these application which have resulted in patents: 780.
Number of these applications still pending: 406.
Commercial use: There appear to be four patents which resulted from Government sponsored research and development contracts and which, to any extent, cover some feature of products currently sold by Raytheon for commercial purposes. The only products thus covered are magnetrons. During the 10-year period involved, Raytheon's sales of magnetrons containing features covered by such patents have been approximately $750,000 per year. It should be borne in mind that Raytheon has many other patents covering features of magnetrons sold by it which did not result from Government research and development contracts.

During the 10-year period, Raytheon had in existence license agreements with General Electric, I.T. & T., Western Electric, English Electric Valve Co., Westinghouse, and R.C.A. under which Raytheon collected no royalties with respect to any patent coverage of Raytheon in the United States. During the same period Raytheon received $20,000 from Motorola for a paid-up license. These licenses were under all of Raytheon's patents in certain broadly defined fields and undoubtedly would have included within their scope patents issued to Raytheon on inventions generated under Government research and development contracts. The extent if any, to which each of these companies may have made devices and equipments incorporating features covered by such patents is information which Raytheon does not possess and believes it is unable to obtain. At the present time, the license to General Electric has terminated, and therefore is no longer in existence. None of Raytheon's royalty receiving licenses are to any extent based upon patents on inventions arising out of Government research and development contracts.

ROHM & HAAS CO.

Number of R. & D. contracts: 12.
Dollar volume of R. & D. contracts: $16,444,900.
Expenditure of company funds for research: $56,686,726.
Percentage of sales to the Government: 1.118.
Number of patent applications filed by the contractor: 23.
Number of these applications which have resulted in patents: Two.
Number of these applications still pending: 17.
Total number of patent applications filed by this firm: 1,138 (calendar year).
Number of these applications which have resulted in patents: 667.
Number of these applications still pending: 364.
Commercial use: None.

RYAN AERONAUTICAL CO.

Number of R. & D. contracts: 54.
Dollar volume of R. & D. contracts: $52,680,000.
Expenditure of company funds for research: Impossible to determine.
Percentage of sales to the Government: 82.8.
Number of patent applications filed by the contractor: 18.
Number of these applications which have resulted in patents: Six.
Number of these applications still pending: 10.
Total number of patent applications filed by this firm: 77.
Number of these applications which have resulted in patents: 25.
Number of these applications still pending: 35.
Commercial use: None. No specific commercial use has been made by any patents obtained by Ryan which resulted from Government R. & D. contracts. Most of these patents are concerned with recent advances in the electronics field where Ryan's sales have been substantially all to the Government.

NOTE.—Ryan produced the world's first jet-plus-propeller airplane; the first Air Force air-to-air missile; and the first Navy turboprop airplane. In electronics RYANAV system in use by the Army and Navy guide aircraft and helicopters. Ryan is prime contractor for the Firebee, a high speed jet target missile. Ryan introduced 18–10 and 19–DL stainless steels into the aircraft industry and has done considerable research in the area of lightweight, high strength, heat-resistant structures. Important in the sales of the company are components for the Douglas DC–8 jet transport and Doppler navigation systems.

Ryan's Electronics Division sales climbed ninefold during the company's last fiscal year. Doppler navigation systems for the U.S. Army and Navy and the British Navy account for the major part of the sales. The company foresees favorable prospects for its flexible wing and vertical takeoff and landing aircraft activities. The flexible wing aircraft is being test-flown under terms of an Army Transportation Research Command contract.

SANDERS ASSOCIATES, INC.

(Period from organization of company on July 24, 1951, through June 30, 1959)

Number of R. & D. contracts: Figure not available.
Dollar volume of R. & D. contracts: $25,900,000.
Expenditure of company funds for research: Approximately $1 million to $1,500,000.
Percentage of sales to the Government: 98.
Number of patent applications filed by the contractor: 20.
Number of these applications which have resulted in patents: 12.
Number of these applications still pending: 8.
Total number of patent applications filed by this firm: 136.
Number of these applications which have resulted in patents: 61.
Number of these applications still pending: 55.
Commercial use: Sanders commercially used patents emerging from a Government contract for transmission line development. The amount of commercial business involved is only a minor fraction of 1 percent of company business. Otherwise Sanders has not commercially used patents arising from Government R. & D. contracts.

SANGAMO ELECTRIC CO.

Number of R. & D. contracts: 10.
Dollar volume of R. & D. contracts: $3,123,977.
Expenditure of company funds for research: Approximately $5 million.
Percentage of sales to the Government: Approximately 35.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: 24.
Number of these applications which have resulted in patents: 13.
Number of these applications still pending: 11.
Commercial use: Since there were no patents resulting from Government R. & D. contracts during this period, there has been no commercial use.

SPACE TECHNOLOGY LABORATORIES, INC.

(A subsidiary of Thompson Ramo Wooldridge, Inc.)

(STL commenced operations as a separate corporation on November 1, 1958. The information furnished below covers the period November 1, 1958, to June 30, 1959)

Number of R. & D. contracts: Five.
Dollar volume of R. & D. contracts: $109,297,000, and under assignment from Thompson Ramo Wooldridge, Inc., its predecessor in business, the performance of work under five Department of Defense research and development contracts with a volume of approximately $92,967,000.

Expenditure of company funds for research: $76,000, of which a portion will be included in STL's overhead reimbursement as allowable general research expenditures.

Percentage of sales to the Government: Substantially all.

Number of patent applications filed by the contractor: One.

Number of these applications which have resulted in patents: None.

Number of these applications still pending: One.

Total number of patent applications filed by this firm: One.

Number of these applications which have resulted in patents: None.

Number of these applications still pending: One.

Commercial use: None. Space Technology Laboratories has recently announced the formation of a products division, which will market commercially the scientific and technical devices developed for space and ballistic missile programs. The division will market such new products as a fast electronic camera and a portable device for measuring atomic frequency.

NOTE.—Space Technology has received a 3-year $2,700,000 engineering contract from the Army to design the Advent communications satellite. The Advent satellites will relay microwave radio communications from three earthbound stations.

SPERRY-RAND CORP.

Number of R. & D. contracts: 737.

Dollar value of R. & D. contracts: $854,272,580.

Expenditure of company funds for research: $132,522,231.

Percentage of sales to the Government: 42.

Number of patent applications filed by the contractor: 488.

Number of these applications which have resulted in patents: 252.

Number of these applications still pending: 225.

Total number of patent applications filed by this firm: 2,016.

Number of these applications which have resulted in patents: 1,176.

Number of these applications still pending: 657.

Commercial use: The following commercial products embody inventions, or include components that embody inventions, which resulted from U.S. Government research and development contracts:

(*a*) Coaxial directional couplers.
(*b*) C–10 and C–11 gyrosyn compasses.
(*c*) Aircraft autopilots A–12, SP–20, SP–30, SP–40.
(*d*) Mark 23 gyro compass.
(*e*) Simplified loran.
(*f*) Selt-saturating magnetic amplifiers with pulsed D.C. control current.
(*g*) 80 to 90 column punched-card alpha-numeric translator.
(*h*) Tangentially-adjusted head for magnetic drum.
(*i*) Electronic head-setting device.
(*j*) Magnetic core pulse-forming switch.

Products (*a*), (*b*), (*c*), (*d*), and (*e*) are made and sold by divisions in the Sperry gyro group; product (*f*) is made and sold by Vickers Inc., a subsidiary; products (*g*), (*h*), (*i*), and (*j*) are made and sold by Remington Rand Division.

The products made and sold by divisions in the Sperry gyro group are complex equipments made up, in most cases, of interrelated assemblies, subassemblies and components. The patented inventions of the Sperry gyro group are used in such assemblies, subassemblies, or components, and are not sold or priced separately. It is therefore impossible to state the number and dollar volume of the sales of such patented inventions. The approximate annual sales by Vickers Inc. of product (*f*) are 200 amplifiers with a total value of $100,000. There were no sales of products (*g*), (*h*), (*i*), and (*j*) in item 8 during the years 1949 through 1952; during the years 1953 through 1959 approximate annual rental income of $14,000 was received from product (*g*), of which only 7 units were manufactured; approximate sales of product (*j*) were $95,000 in 1958, and $14,000 in 1959; there have been only negligible sales of products (*h*) and (*i*), and such products have no present use.

Licenses have been granted under 19 patents resulting from U.S. Government research and development contracts. The total amount of royalty income received from July 1, 1949 to June 30, 1959 under such licenses is $52,190.23.

STAVID ENGINEERING, INC.

(Stavid was acquired by the Lockheed Aircraft Corp. in September 1959 as a wholly owned subsidiary)

Number of R. & D. contracts: 100.
Dollar volume of R. & D. contracts: $34,094,840.
Expenditure of company funds for research: $20,000.
Percentage of sales to the Government: 96.
Number of patent applications filed by the contractor: Three.
Number of these applications which have resulted in patents: Three.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: Five.
Number of these applications which have resulted in patents: Five.
Number of these applications still pending: None.
Commercial use: None.

SYLVANIA ELECTRIC PRODUCTS

Number of R. & D. contracts: 150.
Dollar volume of R. & D. contracts: $222 million.
Expenditure of company funds for research: The total expenditure of private funds for R. & D. has averaged 6 percent of nonmilitary income during the past few years.
Percentage of sales to the Government: 24.
Number of patent applications filed by the contractor: 145.
Number of these applications which have resulted in patents: 65.
Number of these applications still pending: 67.
Total number of patent applications filed by this firm: 1,624.
Number of these applications which have resulted in patents: 560.
Number of these applications still pending: 825.
Commercial use: Sylvania's general policy with regard to granting licenses under its patents to others and the acceptance of licenses under other patents has generally been to consider a general field of

activity rather than specific patents. Therefore, Sylvania knows of no patents being involved which arose out of Government-sponsored R. & D. contracts. Also, Sylvania has cross licenses in a number of broad fields such as the lighting field, the radio purpose field, and so forth, under which all of its patents in these fields are licensed to various licensees in return for licenses under their patents to Sylvania in the same field. In these agreements, Sylvania has no knowledge as to whether licensees may be incidentally using Government R. & D. contracts origin Sylvania inventions, or whether Sylvania may be using some of theirs. However, in no case was a patent so originating a factor in the negotiation of any such agreement.

Sylvania makes no attempt to specifically mark each product with patents under which it is made or which covers it, so Sylvania knows of no patents originating in Government-sponsored R. & D. programs being used in our commercial products to the exclusion of other Sylvania-owned patents such that Sylvania could allocate any particular sales either by volume or dollars to such Government licensed patents.

TELEMETER MAGNETICS, INC.

(From January 1956 (date of company's founding) to June 30, 1959)

Number of R. & D. contracts: Eight.
Dollar volume of R. & D. contracts: $2,222,000.
Expenditure of company funds for research: $431,000.
Percentage of sales to the Government: 23.4.
Number of patent applications filed by the contractor: None.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: 10.
Number of these applications which have resulted in patents: One.
Number of these applications still pending: Eight.
Commercial use: None.

TEXAS INSTRUMENTS

Number of R. & D. contracts: 40.
Dollar volume of R. & D. contracts: $11,900,000.
Expenditure of company funds for research: $18 million.
Percentage of sales to the Government: 52.
Number of patent applications filed by the contractor: 19.
Number of these applications which have resulted in patents: Five.
Number of these applications still pending: Eight.
Total number of patent applications filed by this firm: 318.
Number of these applications which have resulted in patents: 112.
Number of these applications still pending: 140.
Commercial use: The patents resulting from Government research and development contracts which have been used commercially are:

1. Patent No. 2,871,110, Etching of Semiconductor Materials. This method used by Texas Instruments to etch transistors of a certain class (grown junction silicon) of transistors in commercial production (1957–59).
2. Patent No. 2,888,310, Recorder (with magnetic fluid-clutch drive).

In addition, Texas Instruments has granted a license to third parties under three of the patents resulting from Government research and development contracts. These three patents were licensed along with other patents of Texas Instruments developed at private expense and relating to the same subject matter.

THIOKOL CHEMICAL CORP.

Number of R. & D. contracts: 226.
Dollar volume of R. & D. contracts: $254,030,808.
Expenditure of company funds for research: $3,527,122.
Percentage of sales to the Government: 81.
Number of patent applications filed by the contractor: 39.
Number of these applications which have resulted in patents: None.
Number of these applications still pending: 38.
Total number of patent applications filed by this firm: 79.
Number of these applications which have resulted in patents: 15.
Number of these applications still pending: 55.
Commercial use: None.

NOTE.—Thiokol makes the first stage of the solid-fuel Minuteman missile and the solid-propellant motor for the Pershing ballistic missile. It has a part in other programs, such as the Nike-Zeus. Thiokol is engaged with other concerns in feasibility studies of solid-fueled engines as space boosters.

THOMPSON RAMO WOOLDRIDGE, INC.

(These totals do not include Space Technology Laboratories, Inc., after November 1, 1958, when as a division of the Ramo Wooldridge Corp. it became a subsidiary of Thompson Ramo Wooldridge, Inc.)
Number of R. & D. contracts: Information not available.
Dollar volume of R. & D. contracts: $139,731,000 (this figure covers work done both as prime contractor and as subcontractor for the period from January 1, 1951, through December 31, 1959).
Expenditure of company funds for research: $78,822,000 (this figure covers the period from January 1, 1951, through December 31, 1959).
Percentage of sales to the Government: 70.4.
Number of patent applications filed by the contractor: 80.
Number of these applications which have resulted in patents: 15.
Number of these applications still pending: 63.
Total number of patent applications filed by this firm: 993.
Number of these applications which have resulted in patents: 427.
Number of these applications still pending: 497.
Commercial use: None.

UNITED AIRCRAFT CORP.

(This report includes the various operating divisions of United Aircraft, such as Sikorsky Aircraft, Pratt & Whitney Aircraft, etc.)
Number of R. & D. contracts: 211.
Dollar volume of R. & D. contracts: $502 million.
Expenditure of company funds for research: $616 million. A recent report shows increased expenditures on development projects for which the company is paying the bill without contractual support from

the Government. The Government hopes to sell these projects eventually to the Government.

Percentage of sales to the Government: 86.33.

Number of patent applications filed by the contractor: 278.

Number of these applications which have resulted in patents: 171.

Number of these applications still pending: 85.

Total number of patent applications filed by this firm: 802.

Number of these applications which have resulted in patents: 442.

Number of these applications still pending: 288.

Commercial use: The corporation manufactures a variety of product lines—aircraft engines, helicopters, propellers, aircraft fuel controls, aircraft air-conditioning systems, radar systems, electronic components, and others. In general, these products are not, in themselves, patented items; nearly always, however, a product will incorporate one or more patented features. In typical instances, some of these patented features resulted from Government R. & D. contracts, while others were conceived and reduced to practice under company R. & D. projects. Furthermore, few if any of the patents held by the corporation could be considered basic patents, although all patents applicable to a particular product, when considered together, may give a considerable degree of patent protection.

The following tabulation shows the number of patents, resulting from Government R. & D. contracts during the 10-year period, which have application to products sold commercially by the corporation.

Product	*Number of patents*
JT–3 gas turbine engine	30
JT–4 gas turbine engine	29
JT–12 gas turbine engine	17
54H60 propeller	1
JFC–12 and JFC–25 fuel controls	1
S–58 helicopter	1

NOTE.—Although a total of 79 patents are listed in the foregoing tabulation, the aggregate number of different patents involved actually is only 38, because in many cases the same patent applies to more than one engine type.

All of the foregoing products are manufactured by United Aircraft Corp.; in addition, the S–58 helicopter is manufactured by Westland Aircraft, Ltd., in England and Sud Aviation, S.A., in France.

UAC feels it is not practicable to furnish data with regard to the annual sales by volume and dollars of patented items which resulted from Government R. & D. contracts because their products are generally not in themselves patented items, but rather incorporate one or more parts, subassemblies or features protected resulting either from Government R. & D. contracts or company R. & D. projects. The selling price of the complete products cannot be used as a measure of sales of patented items.

The corporation's licenses granted to third parties take several forms:

(*a*) As a member of the Manufacturers' Aircraft Association, the corporation communicates all of its patents relative to aircraft (as distinguished from engines, propellers and other products of the company) to the association for use by other member companies. If such patents are actually put to use by other members, the corporation may receive royalty payments.

The corporation has communicated to the association 22 patents issued from patent applications filed during the 10-year period, which resulted from Department of Defense R. & D. contracts. However, no royalties have been received relating to any of these patents.

(*b*) In a few instances the corporation has licensed specific patented inventions directly to others, in cases where the licensee does not intend to manufacture the corporation's products under license, but merely to use the patented feature in a product of his own design. None of the patents arising out of applications filed during the 10-year period as a result of Department of Defense R. & D. contracts have been licensed in this manner, however.

(*c*) The corporation has a number of license agreements with foreign companies, permitting the licensees to manufacture the corporation's products. These agreements provide not only for license rights to the patents involved, but more importantly for a number of other benefits to the licensee: transfer of engineering drawings and manufacturing data; on-the-spot advice and assistance by the corporation's technical representatives regarding plant layouts, manufacturing methods and other matters; and the passing along to the licensee of current developments in the art of manufacture of the licensed products. Under this type of license agreement, patent rights are incidental to the other benefits to the licensee.

Of the patents issued as a result of applications during the 10-year period, arising out of Government R. & D. contracts, 22 have been licensed to others under license agreements of this type. These license agreements also include many more patents arising out of company projects. The fees received by the corporation under these agreements during the 10-year period aggregated $1,448,507. However, because the total fees paid by the licensees under the agreements are not separated in any way as to payments for drawings and data, know-how, technical assistance, patent rights, etc., it is impossible to state what part of the foregoing amount represented royalties received for use of the patents, except to say that it was a small proportion.

(*d*) At the request of the Government, the corporation granted royalty-free licenses to the Ford Motor Co. and Nash-Kelvinator Corp. to manufacture Pratt & Whitney aircraft engines and spare parts for the U.S. military services. These royalty-free licenses covered patents resulting from company research and development projects as well as patents resulting from Government R. & D. contracts. During the period July 1, 1949, to June 30, 1959, these two companies produced more than 10,000 Pratt & Whitney aircraft engines plus spare parts, under such free licenses. The Chrysler Corp. manufactured over 500 propellers of Hamilton Standard design, plus spare parts, for military under a similar royalty-free license during this period.

UNIVERSAL MATCH CORP.

Number of R. & D. contracts: No information available.

Dollar volume of R. & D. contracts: $21,288,466.

Expenditure of company funds for research: Approximately $3 million.

Percentage of sales to the Government: Approximately 10.

Number of patent application filed by the contractor: None.

Number of these applications which have resulted in patents: None.
Number of these applications still pending: None.
Total number of patent applications filed by this firm: Approximately 50.
Number of these applications which have resulted in patents: Approximately 45.
Number of these applications still pending: Five.
Commercial use: None.

VITRO CORP. OF AMERICA

Number of R. & D. contracts: 115.
Dollar volume of R. & D. contracts: $40,904,941.
Expenditure of company funds for research: For the period January 1, 1951, to June 30, 1959, approximately $3,002,839.
Percentage of sales to the Government: The percentage has ranged from a high of 98 percent to a low of 45 percent.
Number of patent applications filed by the contractor: 42. As of June 30, 1959, applications covering 10 inventions resulting from R. & D. contracts were in various stages of preparation prior to filing.
Number of these applications which have resulted in patents: 22.
Number of these applications still pending: 11. One patent was allowed but placed under a DOD secrecy order prohibiting its issuance.
Total number of patent applications filed by this firm: 76.
Number of these applications which have resulted in patents: 34.
Number of these applications still pending: 25.
Commercial use: None.

WESTERN ELECTRIC CO.

(American Telephone & Telegraph Co. owns 99.8 percent of the stock of Western Electric)

Number of R. & D. contracts: 133.
Dollar volume of R. & D. contracts: $760 million.
Expenditure of company funds for research: $576,978,000. Major part of this amount was paid to Bell Telephone Laobratories. The Bell Laboratories made additional expenditures for R. & D. in the amount of $254,921,000.
Percentage of sales to the Government: 24.3.
Number of patent applications filed by the contractor: 419. Most of these applications were filed on behalf of Bell Laboratories.
Number of these applications which have resulted in patents: 247.
Number of these applications still pending: 160.
Total number of patent applications filed by this firm: 1,505. The filings in behalf of Bell Telephone Laboratories during this period numbered 3,361.
Number of these applications which have resulted in patents: 1,046. Of the 3,361 filing by Bell, 2,323 have matured into issued patents and 893 are still pending.
Number of these applications still pending: 364.
Commercial use: Only three of the patents are known to have been commercially used by Western Electric in non-Government manufacturer. Each of these patents covers circuits which have been in-

corporated in separate communications systems, but in each case represented only on element in a system embodying many other elements, both patented and nonpatented. Three other patents are known to have been used by Western Electric only experimentally and for equipment testing. Another of such patents is known to have been commercially used in non-Government manufacture by one of the company's patent licensees, the General Radio Co. of West Concord, Mass. This patent covered transistor circuitry in an oscillator and an impedance bridge.

The approximate value of sales by Western Electric of products in which circuits covered by patents resulting from DOD work were incorporated is not known. The company does not know the volume of sales by its licensees of any product embodying any of the patents except in the case of sales of the products by General Radio Co., whose sales subject to royalty averaged approximately $21,000 annually over the period of approximately 3½ years from issue of the patent to the end of 1959.

Western Electric has not granted any license specifiying any of the patents resulting from DOD work, but licenses thereunder have been granted, under the many licenses given under all Bell System patents, to the extent that any of them may be applicable to the license subject matter. The company is unable to state the amount of royalty received from any license except in the case of the license to General Radio Co. under which a total of $2,542 has been received through 1959 in royalty income.

WESTINGHOUSE ELECTRIC CORP.

Number of R. & D. contracts: 338.

Dollar volume of R. & D. contracts: $249,693,185 (10 contracts accounted for over 45 percent of the total).

Expenditure of company funds for research: The expenditure of private funds for research and development falls into two main categories under Westinghouse's accounting system. The first includes basic and applied R. & D. directed toward product lines. This expenditure amounted to $544,131,000. The second category includes the R. & D. required for a specific order carried in an account called "Customer order development." This account also records the cost of Government R. & D. work and reflects an expenditure of $718,649,000. The total for the two categories is $1,262,780,000. These figures are direct costs only and do not include fee and such overhead costs as general and administrative expense.

Percentage of sales to the Government: 19.6.

Number of patent applications filed by the contractor: 262.

Number of these applications which have resulted in patents: 123.

Number of these applications still pending: 74.

Total number of patent applications filed by this firm: 5,428.

Number of these applications which have resulted in patents: 3,288.

Number of these applications still pending: 1,197.

Commercial use: Westinghouse feels it is unable to answer as to the extent to which a commercial use has been made of each patent resulting from Government R. & D. contracts. Westinghouse does not have available records and the company doubts whether such

records could be established. In addition Westinghouse has entered into a large number of licenses involving many patents. The company has no knowledge of which of these are actually used commercially. The only products that Westinghouse is able to determine as using patents arising out of DOD R. & D. contracts are brushless rectifier generators, industrial gas turbines and runway markers. To the extent that Westinghouse has been able to identify products embodying patented features, it is estimated that there were $40 million of sales of products embodying patents resulting from DOD work.

Westinghouse has received no inquiry concerning nor request for a license under any particular patent resulting from Government R. & D. contract. Therefore, they have not yet licensed third parties under any identified patents issued on inventions made in connection with DOD R. & D. contracts. Under this policy Westinghouse has several hundred active licenses in which rights have been granted under Westinghouse inventions. A number of these involved royalty-free exchanges of rights under all patents of the parties in connection with specified products. In such cases, all patents resulting from Government R. & D. contracts are licensed to others.

NOTE.—Westinghouse has been working with the Air Force in the field of molecular electronics, which may revolutionize the electronic industries and extend man's reach into space. Current long-range development studies at Westinghouse's Air Arm Division includes work in highly advanced bomber defense systems, infrared detection, reconnaissance systems, analog and digital computers, thermal and radar detection, indicator display, fuses data processing and other phases of electronic warfare.

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