

I.L.C. IN VITRO CONVERSION: PROCESSES INVOLVING SYNTHESIS GAS  
2. REACTING SYNTHESIS GAS

PATENTING UPDATE (1/79-8/79)

<u>Patent No.</u>	<u>Assignee &amp; Title</u>
4,132,672	<u>American Gas Association, Arlington Va:</u> Methanation Catalyst
4,132,727	<u>Texas Gas Transmission Corporation:</u> Method And Apparatus For The Manufacture Of Methanol
4,133,825	<u>British Gas Corporation:</u> Production Of Substitute Natural Gas
4,133,841	<u>Institut Francais du Petrole, France:</u> Process For Upgrading Effluents From Synthesis Of The Fischer-Tropsch Type
4,134,732	<u>Continental Oil Company:</u> Floating Methanol Plant
4,134,907	<u>Hazen Research Inc.:</u> Process For Enhancing The Fuel Value Of Low BTU Gas
4,134,908	<u>Foster Wheeler Energy Corporation:</u> Methanation Process
4,136,104	<u>Celanese Corporation:</u> Production Of Acetic Acid
4,138,442	<u>Mobil Oil Corporation:</u> Process For The Manufacture Of Gasoline
4,139,550	<u>Suntech, Inc.:</u> Aromatics From Synthesis Gas
4,139,551	<u>The Rafel Industrial Group Ltd., Hamilton, Bermuda:</u> Catalyst For Methane And Ethane Synthesis
4,140,602	<u>Texas Gas Transmission Corporation:</u> Method For Obtaining Carbon Dioxide From The Atmosphere And For Production Of Fuels
4,142,993	<u>The Research Council of Alberta:</u> Transition Metal Catalyst
4,146,503	<u>Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany:</u> Process For Preparing A Catalyst For Reducing Carbon Monoxide
4,146,504	<u>Graham Magnetics Inc.:</u> Porous Powders And A Method For Their Preparation.
4,149,940	<u>Imperial Chemical Industries Ltd:</u> Methanol

- 4,151,190      The Dow Chemical Company:      Process For Producing  
C<sub>2</sub>-C<sub>4</sub> Hydrocarbons From Carbon Monoxide And Hydrogen
- 4,151,191      The American Gas Association:      Sulfur Resistant  
Molybdenum Catalysts For Methanation
- 4,151,192      Union Carbide Corporation:      Promoting N-Propyl Alcohol  
Formation With Vanadium Compounds
- 4,152,407      Warren Fuchs, 107 Cheny La, Syosset, N.Y. 11791:      Process  
And Apparatus For Exothermic Reactions
- 4,153,623      Union Carbide Corporation:      Promoting Propylene Glycol  
Formation With Compounds Of Aluminum
- 4,154,751      Exxon Research & Engineering Co:      Preparation And Use  
Of Supported Potassium (or Rubidium) - Group VIII -  
Metal Cluster Catalysts In CO<sub>2</sub>/H<sub>2</sub> Fischer - Tropsch  
Synthesis Reactions
- 4,155,928      Phillips Petroleum Company:      Methanation Of Carbon  
Monoxide Over Tungsten Carbide      Containing Catalysts
- 4,157,338      Mobil Oil Corporation:      Conversion Of Synthesis Gas To  
Hydrocarbon Mixtures
- 4,158,637      Westinghouse Electric Corp.:      Conversion Of Coal Into  
Hydrocarbons
- 4,159,236      Gulf Oil Corporation:      Method For Combining Coal  
Liquefaction And Gasification Processes
- 4,159,237      Gulf Oil Corporation:      Coal Liquefaction Process Employing  
Fuel From A Combined Gasifier
- 4,159,238      Gulf Oil Corporation:      Integrated Coal Liquefaction  
Gasification Process
- 4,159,995      Mobil Oil Corporation:      Conversion Of Synthesis Gas To  
Hydrocarbon Mixtures Utilizing Dual Reactors
- 4,160,649      UOP, Inc.:      Substituted Natural Gas Via Steam Reforming  
Of Kerosene
- 4,161,489      Mobil Oil Corporation:      Conversion Of Mixtures Of Carbon  
Oxides And Hydrogen
- 4,162,145      Phillips Petroleum Company:      Regeneration Of Liquid  
Absorbents
- 4,162,261      Union Carbide Corporation:      Novel Solvents For The  
Catalytic Process For Making Polyhydric Alcohols
- 4,162,262      Union Carbide Corporation:      Process For Producing  
Two-Carbon Atom Compounds From Synthesis Gas With  
Minimal Production Of Methanol

APPENDIX A - EXPLANATORY NOTES

Composite Total (Part 2B): Part 2C of each profile comprises an alphabetical listing of assignees. In some instances, assignees are listed in more than one place due to variations in the printing of the name. These variations occur for a number of reasons, such as typographical errors, changes in company names or differences in spacing or abbreviations. In Part 2B of each profile, which ranks assignees according to number of patents held, the number of patents listed for certain assignees may be a composite resulting from the combination of different titles which in fact signify identical assignees. An asterisk appears next to these totals. This will alert the reader that the particular assignee is listed under more than one title in Part 2C. Such assignees are listed below.

For: BRANDON, ORPHA B.  
See Also: ORPIIA BRANDON

For: ENGELHARD MINERALS + CHEMICALS CORPORATION  
See Also: ENGELHARD INDUSTRIES, INC.

For: FIRMA CARL STILL  
See Also: FIRMA CARL STILL RECKLINGHAUSEN, and  
RECKLINGHAUSEN, CARL STILL, FIRMA

For: HEINRICH KOPPERS GMBH  
See Also: KOPPERS, HEINRICH, GESELLSCHAFT MIT BESCHRANKTER  
HAFTUNG and HEINRICH KOOPERS GMBH

For: MOBIL OIL CORPORATION  
See Also: MOBILE OIL CORPORATION

For: OIL SHALE CORPORATION  
See Also: OIL SHALE CORPORATION (TOSCO)

For: RALPH M. PARSONS COMPANY  
See Also: PARSONS, RALPH M., COMPANY

For: RHEINISCHE BRAUNKOHLLENWERKE AG  
See Also: REINISCHE BRAUNKOHLLENWERKE A.G.

For: SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ, B.V.  
See Also: SHELL INTERNATIONAL RESEARCH MAATSCHAPPIJ, B.V.

For: STEAG AG  
See Also: STEAG AKTIENSELLSCHAFT

For: TENNECO OIL COMPANY  
See Also: SENNECO OIL COMPANY

For: UNITED STATES OF AMERICA, DEPARTMENT OF ENERGY  
See Also: UNITED STATES OF AMERICA, ATOMIC ENERGY  
COMMISSION

Application Filing Date: The application filing date information as set forth in Parts 1 and 2A of the profiles is determined by taking all of those patents which issued between 1967 and 1978 and distributing them yearly based on the date when the application was filed. Patents which were granted prior to 1967 are not included since the application date information for these patents is not in the data base. Also, applications which were filed but never issued (roughly 30% of the total filings), as well as those applications which were still pending as of December 31, 1978 are not included. Thus, only those applications which were filed and subsequently became patents with patent grant dates between 1967 and 1978 are included.

While the length of time between the patent application date and the patent grant date varies, the current pendency is approximately 20 months. Clearly many applications filed in 1978 were still pending at the end of 1978, as were a number of those filed in 1977. While a small number of applications which were filed prior to 1977 were still pending, OTAF feels that the application date data prior to January 1977 is essentially complete. That is, the number shown for applications filed in the years prior to 1977 will not differ substantially with the passage of time, and this number is a true reflection of the number of applications filed in that year which have and will become patents. However, for the subsequent years, 1977 and 1978, that number will increase as more applications become patents.

For those years prior to 1967, it should be remembered that the numbers reflect only those applications which became patents between 1967 and 1978. Thus, the column "pre 65" does not reflect all applications filed before 1965 but only those which issued in 1967 and subsequently. The graph of this information in Part 1 of each profile is limited to the years 1967 to 1976 and thus is an essentially accurate reflection of activity based on the application dates of subsequently issued patents.

Assignee - This term refers to companies, organizations or individuals to which the inventor's titles and rights to a patent are assigned. For the purpose of this publication, the assignee will in all cases refer to the assignee at the time the patent was granted. Approximately 80% of all U.S. patents are assigned when granted. By far, the largest portion of assignees are corporations.

Country Codes - The following country codes appear in Part 2D of this profile. Due to changes in codes during the period covered, some countries are identified by more than one code.

BR - Brazil  
 CA - Canada  
 CT - China (Taiwan)  
 DE - Federal Republic of Germany  
 DT - Federal Republic of Germany  
 FR - France  
 JA - Japan  
 SU - Union of Soviet Socialist Republics  
 SW - Sweden  
 TW - China (Taiwan)  
 ZA - South Africa

## APPENDIX B

## OBTAINING PREVIOUS OTAF PUBLICATIONS\*\*

Copies of the previous OTAF publications listed below are available from:

National Technical Information Service (NTIS)  
5285 Port Royal Rd.  
Springfield, Virginia 22161  
(703) 557-4690

When ordering from NTIS, please give the publication title and its "COM" or "PB" number.

1. Initial Publication, May 1973  
COM 73-10767; Cost: Domestic - \$6.50 Foreign - \$13.00  
Describes OTAF program and gives sample reports on 24 wide ranging areas of technology in varying levels of detail.
2. Early Warning Report, December 1973  
COM 74-10150; Cost: Domestic - \$11.00 Foreign - \$22.00  
Spotlights those technological areas experiencing a high level of overall activity or of foreign activity. Reviews patent activity in a number of energy areas, including nuclear; solar; geothermal; and tide, wind and wave energy.
3. Third Report, June 1974  
COM 74-11383; Cost: Domestic - \$9.00 Foreign - \$18.00  
Presents an overview of the technological activity, across all technologies, of a group of selected foreign countries and a group of selected U.S. states. Extends energy area treatments to include oil shale and coal gasification technologies. Reviews additional high overall activity technological areas.
4. Fourth Report: A Review of Patent Ownership, January 1975  
COM 75-10050; Cost: Domestic - \$7.25 Foreign - \$14.50  
Identifies the 73 corporations and government agencies which received 500 or more patents during the five year period 1969-1973, and reviews and compares their patent activity across the spectrum of technology. Also reviews in terms of patent ownership, the patent activity during the same period, in nuclear energy technology and oil shale and coal gasification technology.
5. Fifth Report, August 1975  
COM 75-11142, Cost: Domestic - \$8.00 Foreign - \$16.00  
Reviews 60 technological areas, not previously reported on, experiencing a high level of overall activity or of foreign activity. Presents patent activity data in categories corresponding to 36 Product Fields of the Standard Industrial Classification System.

-----  
\*\* SPECIAL NOTE: NTIS AND GPO PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

6. Sixth Report, June 1976  
 PB 254188, Cost: Domestic - \$9.00 Foreign - \$18.00  
 Reviews 15 technologies with unusually high activity by foreign resident inventors, and 22 high overall activity technologies; updates the 1973 reports on patent activity in solar and other natural energy sources, and adds reports on the use of waste material and wind for energy generation. Presents comparisons of patenting to R&D expenditures and R&D manpower allocations in six selected industries. The report concludes with a review of six most often cited patents in 1975, 5 U.S. and 1 foreign patent.
  
7. Seventh Report, March 1977\*  
 PB 265792, Cost: Domestic - \$9.25 Foreign - \$18.50  
 Reviews historical patenting and trademark registration trends, and includes the most extensive collection of historical U.S. patent data ever presented in a single publication. Makes first use in the series of data relating to patents granted by foreign nations for a study of invention sources. Makes first use in the series of pending patent application data for forecasting. Presents brief reviews of 16 technologies experiencing high overall or foreign patent activity. Concludes with the series most comprehensive assessment of activity in a given technology, specifically in computer memories.
  
8. Eighth Report, December 1977\*  
 PB 276375, Cost: Domestic - \$7.25 Foreign - \$14.50  
 Reviews U.S. patenting in the context of domestic vs. international patenting and analyzes the balance of patenting between the U.S. and other countries. Presents a study demonstrating the uniqueness of patents and the patent file as a technological resource. Concludes with an in-depth analysis of patent activity in geophysical exploration for hydrocarbons.
  
9. Ninth Report, March 1979\*  
 PB 293380 Cost: Domestic - \$9.00 Foreign - \$18.00  
 Reviews "Top Fifty" most active technologies (U.S.P.C. subclasses) in three categories -- Most Active ; Fastest Growing, and Most Foreign-Active -- for each of three broad groupings of technology -- Chemical, Electrical and Mechanical. Examines trends in domestic patenting and independent inventor patenting. Includes an extensive review of patenting in "Ferrous Metal" technologies. Concludes with a discussion of two experiments in the transfer of "appropriate technology" to small businesses and developing countries.

NTIS Microfilm of Previous Reports

Domestic - \$3.00 per report; Foreign - \$4.50 per report

\*NOTE: The Seventh, Eighth, and Ninth Reports may also be obtained from the Superintendent of Documents; U.S. Government Printing Office; Washington, D.C. 20402. Their identification numbers and costs are:

- . Seventh Report 003-004-00542-4, price: Domestic \*\*\$4.25;
- . Eighth Report 003-004-00550-5, price: Domestic \*\*\$3.75;
- . Ninth Report 003-004-00559-9, price: Domestic \*\*\$4.00.

\*\*Add 25% handling cost for foreign orders

## APPENDIX C

## OBTAINING ADDITIONAL INFORMATION OR SPECIAL REPORTS

Background

OTAF's computerized base of data relating to the patent file includes, at present:

- all subclasses of the U.S. Patent Classification System
- the relationship of all subclasses of the U.S. Patent Classification System to the Standard Industrial Classification System in 55 Product Fields and Product Field combinations
- for U.S. patents issued since 1963,
  - . the ownership at time of issue in seven categories (U.S. government, foreign government, U.S. corporation, foreign corporation, U.S. individual, and unassigned)
  - . the country or state of residence of the inventor
- for U.S. patents issued since 1967,
  - . the date the application for patent was filed in the U.S. Patent and Trademark Office
- for U.S. patents issued since 1969,
  - . the specific (i.e. named) ownership of all patents which, at time of issue, were organizationally owned (e.g., by a corporation, foundation, government agency).
  - . the patent title
- for U.S. patents issued since 1975,
  - . the address of the inventor, and the field of search and references cited in the patentability examination leading to the patent grant.

Special Reports

Data can be retrieved on the basis of any one or any combination of the factors listed above, manipulated on most any given basis and presented in a number of formats, e.g., lists, tables, graphs, charts, etc. This flexibility is illustrated by the various types of reports presented in this Appendix and in the nine OTAF previous general distribution publications.

OTAF has developed several standard special report programs which are designed to extract and present, for any given grouping of patents, a wide variety of data. Excerpts from samples of reports prepared using these programs are included in this Appendix.

## STANDARD SPECIAL REPORTS

### "Technology Profile" Report

This is a multi-part report utilizing many of the elements in OTAF's data base to provide a detailed patent profile for a specific technology or grouping of technologies. Information provided includes rate of patenting, origin of patenting, type of assignment and specific assignment, patent numbers and their titles, and names and addresses of "independent" inventors. There are four parts (parts A,B,C,&D) which comprise a complete report. Part A includes patenting activity percentages, general assignment and distribution of origin of patents; Part B includes, by assignee, the numbers of patents granted by both year of application filing and grant date, ranked by assignee with highest number of patents; Part C includes, alphabetically, the assignees and their specific patent numbers and titles; Part D gives the name and address of the inventors of patents unassigned at time of issue. Any Part can be prepared depending on your needs. This PATENT PROFILES publication is itself an example of the kinds of data presented in a "Technology Profile" report.

### "Organizational Profile" Report

Beginning on page 225 are excerpts from the second of OTAF's standard format special reports. The sample report profiles the patent activity across the classes and subclasses of the U.S. Patent Classification system. A report for Communications Satellite Corp. is given as an example. Two pages of the 40 page report are included. This type of report can be prepared, for example, on the patents of any organization or grouping of organizations, or on the patents granted to the residents of any state or country or grouping of states or countries.

### Multi-Corporate Patent Activity Profile

Like the above described Organizational Profile, this report also profiles 1969-1978 patent activity across the classes and subclasses of the U.S. Patent Classification System. In this report the activity of up to eight organizations can be profiled simultaneously, facilitating comparisons between organizations. Unlike the Organizational Profile no patent numbers or patent titles are given.

### SIC Product Field Reports

On pages 227 to 229 is a listing of Standard Industrial Classification (SIC) Product Fields for which a concordance exists with subclasses of the U.S. Patent Classification System. Special patent reports, such as the "Technology Profile" Report can be prepared for any of these Product Fields.



### How to Obtain Special Reports

1. In making an initial determination of interest in a special OTAF report, you are urged to review the data items that are available and decide if any one or combination of them, or any relationship between two or more of them, might be useful to your needs. Special attention should be given to the standard format reports to determine if these multi-purpose, relatively low cost reports would meet your needs.
2. In most instances, interest, once determined, will be limited to particular technological areas or to particular organization owning patents. In the case of technological areas, their definition is of key importance and must ultimately be in terms of classes and sub-classes of the U.S. Patent Classification System (or one of the 55 SIC Product Fields or Field combinations). If you are unfamiliar with the U.S. Patent Classification System, develop as clear and precise an explanation of your area(s) of interest as possible. For assignment information, the parent organization and its subsidiaries of interest should be identified. Recent name changes (e.g. Esso-Exxon), if known, should be indicated.
3. At this point, you should contact OTAF, indicate the type of information you desire and, if you wish, what your needs are. (Perhaps alternatives can be suggested to better meet those needs). If you cannot provide class and subclass definition of your area of interest, OTAF will attempt to do that for you, using your description of the area.
4. Once there is a clear mutual understanding of the information you want, the format in which you want it and the area(s) to be included, an estimate of cost will be developed and provided to you along with a statement of the work to be done.
5. Once agreement on work to be done and cost is reached, and payment is received, the report will be prepared and provided.

### Costs

All special reports are prepared on a cost reimbursable basis. These costs may vary widely - from as low as \$50.00 for some forms of our standard format reports, to several thousand dollars for complex and large scale treatments of many technological categories, requiring extensive professional time, or programming and/or computer time. Cost estimates for specific requested special reports will be provided prior to report preparation.

### Whom to Contact

Inquiries concerning OTAF publications/services are invited and should be directed to:

Office of Technology Assessment  
and Forecast  
U.S. Patent and Trademark Office  
Washington, D.C. 20231  
Phone: (703) 557-3050

SAMPLE ORGANIZATIONAL PROFILE REPORT - COMMUNICATIONS SATELLITE CORPORATION  
EXPLANATION OF DATA

DESCRIPTION OF PATENT PROFILES

THE REPORT PROFILES ONLY THOSE PATENTS FALLING INTO A PARTICULAR "CATEGORY" (E.G., SPECIFIC OWNERSHIP, COUNTRY OR STATE OF INVENTOR RESIDENCE), BY THE U.S. PATENT CLASSIFICATIONS INTO WHICH THOSE PATENTS HAVE BEEN PLACED.

EACH MAJOR PATENT CLASSIFICATION (CLASS) IS IDENTIFIED BY ITS TITLE. THEN, FOR EACH OF THE SUBCLASSES WITHIN THAT CLASS WHEREIN PATENTS FROM THE "CATEGORY" HAVE BEEN PLACED, THE FOLLOWING ARE GIVEN:

- TOTAL PATENTS
- OR ( ORIGINAL) PATENTS
- XR (CROSS-REFERENCE) PATENTS
- PCT (PERCENT) OF TOTAL OR WITHIN THE "CATEGORY"
- PCT (PERCENT) OF ALL (OR & XR) PATENTS WITHIN THE "CATEGORY"

ALSO GIVEN ARE THE PATENT NUMBERS OF THE "CATEGORY" PATENTS IN THAT CLASSIFICATION. THE TYPE OF CLASSIFICATION (OR ORXR) ASSIGNED TO EACH PATENT IS SHOWN IN PARENTHESES FOLLOWING THE PATENT.

FOR PATENTS ISSUED IN 1989 AND SUBSEQUENTLY, THE PATENT TITLES ARE GIVEN. (NOTE: ANY SYMBOLS IN A PATENT TITLE WHICH ARE NOT AVAILABLE ON THE COMPUTER PRINTER ARE SPELLED OUT, EG.,  $\beta$  IS SHOWN AS BETA. SUPERSCRIPTS AND SUBSCRIPTS ARE INDICATED BY ENCLOSURE BETWEEN UPWARDLY OR DOWNWARDLY FACING SLASHES. E.G., H<sub>2</sub>O IS SHOWN AS H/2 \ O AND Y<sup>2</sup>X IS SHOWN AS Y \ 2/X.)

PATENTS INCLUDED IN PROFILE

THE PATENTS INCLUDED IN THE REPORT ARE THOSE WHICH, ACCORDING TO THE DATA OF RECORD IN THE OTAF COMPUTER DATABASE, FALL WITHIN THE CATEGORY COVERED IN THE REPORT. THESE CATEGORY DATA ARE RECORDED AT THE TIME OF PATENT ISSUE AND ARE ESSENTIALLY ACCURATE. HOWEVER, ANY PATENT LISTING OR DATA PROVIDED IN THIS REPORT SHOULD NOT BE CONSIDERED TO BE INCLUSIVE OF ALL RELEVANT PATENTS, NOR EXCLUSIVE OF ALL NON-RELEVANT PATENTS.

DTAF SPECIAL REPORT  
 CLASSIFICATION PROFILE - (1960 - 1977) PATENTS ASSIGNED TO THE COMMUNICATIONS SATELLITE CORP. (COMS)

CLASS	178	-	TELEGRAPHY										
SUBCLASS 65 B (CONTINUED)													
	3529245	(XR)	-	SYSTEM FOR RECONSTITUTING A CARRIER REFERENCE SIGNAL USING A SWITCHABLE PHASE LOCK LOOP									.6
	3546651	(XR)	-	QUADRIPHASE MODEM									
SUBCLASS 67	TOTAL	3	(OR)	1	(XR)	2	PCT OF TOTAL OR	.7	PCT OF ALL	(OR+XR)			.6
	3600647	(OR)	-	PHASE AMBIGUITY RESOLUTION SYSTEM USING CONVOLUTIONAL CODING-THRESHOLD DECODING									
	3707600	(XR)	-	DIGITAL DIFFERENTIAL PULSE CODE MODULATION SYSTEM									
	3738507	(XR)	-	PHASE AMBIGUITY RESOLUTION FOR FOUR PHASE PSK COMMUNICATIONS SYSTEMS									
SUBCLASS 68	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL	(OR+XR)			.2
	3484782	(XR)	-	BI-ORTHOGONAL CODE GENERATOR									
SUBCLASS 69.1	TOTAL	4	(OR)	1	(XR)	3	PCT OF TOTAL OR	.7	PCT OF ALL	(OR+XR)			.8
	3755554	(OR)	-	FRAME SYNCHRONIZER FOR A BI-ORTHOGONAL DECODER									
	3509471	(XR)	-	DIGITAL PHASE LOCK LOOP FOR HIT TIMING RECOVERY									
	3730998	(XR)	-	TDMA SATELLITE COMMUNICATIONS SYSTEM WITH AN APERTURE WINDOW FOR ACQUISITION									
	3812430	(XR)	-	TDMA SATELLITE COMMUNICATIONS SYSTEM WITH IMPROVED ACQUISITION									
SUBCLASS 79	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL	(OR+XR)			.2
	3484782	(XR)	-	BI-ORTHOGONAL CODE GENERATOR									
TOTAL CLASS 178	TOTAL	13	(OR)	2	(XR)	11	PCT OF TOTAL OR	1.4	PCT OF ALL	(OR+XR)			2.6
CLASS 179 - TELEPHONY													
SUBCLASS 1 VC	TOTAL	5	(OR)	5	(XR)	0	PCT OF TOTAL OR	3.5	PCT OF ALL	(OR+XR)			1.0
	3712050	(OR)	-	METHOD AND APPARATUS FOR DETECTING SPEECH SIGNALS IN THE PRESENCE OF NOISE									
	3432491	(OR)	-	DIGITAL VOICE SWITCH WITH AN ADAPTIVE DIGITALLY-CONTROLLED THRESHOLD									
	3478337	(OR)	-	DEVICE FOR SPEECH DETECTION INDEPENDENT OF AMPLITUDE									
	3690467	(OR)	-	DIGITAL VOICE SWITCH FOR USE WITH DELTA MODULATION									
	4008375	(OR)	-	DIGITAL VOICE SWITCH FOR SINGLE OR MULTIPLE CHANNEL APPLICATIONS									
SUBCLASS 1 P	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL	(OR+XR)			.2
	4008375	(XP)	-	DIGITAL VOICE SWITCH FOR SINGLE OR MULTIPLE CHANNEL APPLICATIONS									
SUBCLASS 15 PD	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL	(OR+XR)			.2
	3928804	(XR)	-	ZONE SHARING TRANSPONDER CONCEPT									
SUBCLASS 15 AE	TOTAL	1	(OR)	0	(XR)	1	PCT OF TOTAL OR	0.0	PCT OF ALL	(OR+XR)			.2
	3707490	(XR)	-	DIGITAL DIFFERENTIAL PULSE CODE MODULATION SYSTEM									
SUBCLASS 15 AF	TOTAL	1	(OR)	1	(XR)	0	PCT OF TOTAL OR	.7	PCT OF ALL	(OR+XR)			.2

SIC PRODUCT FIELDS

<u>PRODUCT FIELDS</u>	<u>SIC CATEGORY</u>
Food and Kindred Products	20
Textile Mill Products	22
Chemicals and Allied Products	28
Chemicals, Except Drugs & Medicines	281, 282, 284-289
Basic Industrial Inorganic & Organic Chemistry	281, 286
Industrial Inorganic Chemistry	281
Industrial Organic Chemistry	286
Plastics Materials & Synthetic Resins	282
Agricultural Chemicals	287
All Other Chemicals	284, 285, 289
Soap, Detergents, and Cleaning Preparations, Perfumes, Cosmetics & Other Toilet Preparations	284
Paints, Varnishes, Lacquers, Enamels, and Allied Products	285
Miscellaneous Chemical Products	289
Drugs and Medicines	283
Petroleum & Natural Gas Extraction & Petroleum Refining	13, 29
Rubber & Miscellaneous Plastics Products	30
Stone, Clay, Glass and Concrete Products	32
Primary Metals	33, 3462, 3463
Primary Ferrous Products	331, 332, 3399, 3462
Primary & Secondary Non-Ferrous Metals	333-336, 339 (except 3399), 3463
Fabricated Metal Products	34 (except 3462, 3463, 348)

<u>PRODUCT FIELDS</u>	<u>SIC CATEGORY</u>
Machinery, Except Electrical	35
Engines & Turbines	351
Farm & Garden Machinery & Equipment	352
Construction, Mining & Material Handling Machinery & Equipment	353
Metal Working Machinery & Equipment	354
Office Computing & Accounting Machines	357
Other Machinery, Except Electrical	355, 356, 358, 359
Special Industry Machinery, Except Metal Working Machinery	355
General Industrial Machinery & Equipment	356
Refrigeration & Service Industry Machinery	358
Miscellaneous Machinery, Except Electrical	359
Electrical and Electronic Machinery, Equipment and Supplies	36, 3825
Electrical Equipment, Except Communication Equipment	361-364, 369, 3825
Electrical Transmission & Distribution Equipment	361, 3825
Electrical Industrial Apparatus	362
Other Electrical Machinery, Equipment & Supplies	363, 364, 369
Household Appliances	363
Electrical Lighting & Wiring Equipment	364
Miscellaneous Electrical Machinery, Equipment & Supplies	369

<u>PRODUCT FIELDS</u>	<u>SIC CATEGORY</u>
Communication Equipment & Electronic Components	365-367
Radio & Television Receiving Equipment, Except Communication Types	365
Electronic Components & Accessories & Communication Equipment	366-367
Transportation Equipment	37, 348
Motor Vehicles & Other Transportation	348, 371, 373-376, 379
Motor Vehicles & Motor Vehicles Equipment	371
Guided Missiles & Space Vehicles & Parts	376
Other Transportation Equipment	373-375, 379 (except 3795)
Ship & Boat Building & Repairing	373
Railroad Equipment	374
Motorcycles, Bicycles & Parts	375
Miscellaneous Transportation Equipment	379 (except 3795)
Ordinance Except Missiles	348, 3795
Aircraft & Parts	372
Professional & Scientific Instruments	38 (except 3825)

## APPENDIX D

## ACKNOWLEDGEMENTS

Patent and Trademark Office contributors to this publication are listed below. Special thanks are extended to Patent and Trademark Office professional and technical personnel whose continuing input to the Technology Assessment and Forecast program is indispensable.

## OFFICE OF TECHNOLOGY ASSESSMENT AND FORECAST

STAFF:

William S. Lawson, Director  
John F. Terapane, Ph.D., Senior Analyst  
Donald G. Kelly, Senior Analyst  
Gary R. Robinson, Data Control & Analysis Technician  
Terry D'Amico, Secretary  
Lisa A. Ferrari, Editorial Assistant

COORDINATOR FOR THIS REPORT:

Jane S. Myers, Primary Examiner

CONSULTANTS

The following patent examiners and classifiers whose areas of expertise are included in this publication served as consultants during its preparation.

Mr. Peter Glickert  
Mr. Peter F. Kratz  
Mr. Howard T. Mars  
Mr. Stephen J. Novosad

Mr. Walter Pretka  
Mr. Ernest R. Purser  
Mr. Joseph Scovronek  
Mr. William G. Wright