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1981 BUDGET OF THE GERMAN FEDERAL MINISTRY FOR RESEARCH AND TECHNOLOGY

Anonymous

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16. Abstract

This article outlines the German research and technology programs for 1978 -1981.

The amounts of money proposed for various programs are given.

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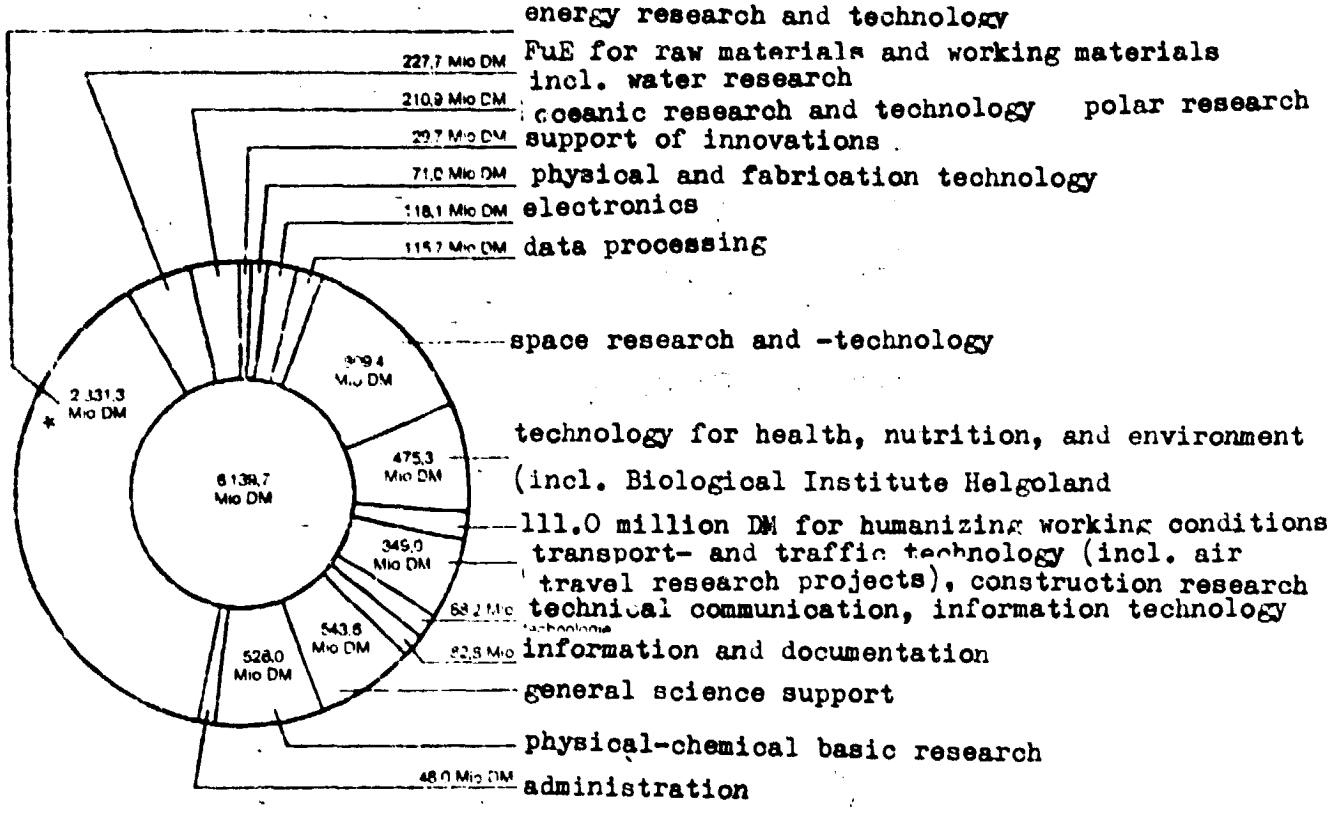
Shall be set up in 1980. The increased money will be directed crucially into the areas of coal research and technology and into the technology for the elimination of nuclear worries. In the area of reactor development it will be difficult this year to comply with the financial plans despite an increase of 5.4% over 1980.

Minister von Buelow stated that he would attempt in the next weeks to arrive, on the subject of the support of high-technology demonstration projects, at a new distribution of the financial burdens in conjunction with energy economics which should burden the BMFT budget to a considerably smaller degree. For that reason he would conduct talks on this subject with the electricity supply industries which should be directly interested to promote a breakthrough of reactor line progress and of the uranium enrichment technology in the Federal Republic of Germany. The electricity supply industry has already been challenged in the second draft of the energy program of the Federal Republic in 1977 to make greater contributions to the costs of research and development of new energy technologies. The coalition agreements made during the governmental formation emphasized this point, brought it to a realization and expanded it.

In the area of regenerative energy research we cannot avoid to postpone several cost-intensive demonstration projects such as solar-heated swimming pools in order to be able to continue to promote, in their place, the research and development capabilities. Even here it is important that the BMFT (Federal Ministry for Research and Technology) take a back seat in the future in the promotion of high-technology demonstration projects. In view of reduced annual growth rates the "financial explosive power" to promote numerous and overly large undertakings must be decreased. This, however, does not mean a complete withdrawal from demonstration projects which, as the final link in the innovation chain, are of great importance in certain cases in order to convert, as an example,

the results of supported research projects into actual practice.

Further development of the research and technology politics



*=million DM

Goal- and Program Spectrum of the BMFT Budget 1981

Main goal	Program	- in millions of DM - should be 1981	should be 1980	changes in %
assurance of material resources	1. energy research and technology	2331.3	2200.8	+ 5.9
	2. FuE for raw materials and operating materials	227.7	224.0	+ 1.6
	3. oceanic research and ocean technology; polar research	210.9	198.0	+ 6.5
maintaining/ increasing the industrial competitive capability	4. promotion of innovations	29.7	33.3	-10.8
	5. physical and fabrication technology	71.0	70.1	+ 1.2
	6. electronics	118.1	115.6	+ 2.1
	7. data processing	115.7	169.6	-31.7
	8. space research and technology	809.4	791.3	+ 2.2
improvement in human living conditions	9. technology for health nutrition, and environment	475.3	451.0	+ 5.3
	10. humanizing working conditions	111.0	110.0	+ 0.9
modernization and improvement of the public intrastructure and service performances	11. transport and traffic technology (including air-travel research); construction research	349.0	369.2	- 5.4
	12. technical communication, information technology	88.2	75.6	+16.6
	13. information and documentation	82.8	91.3	- 9.3
basic research	14. general science promotions	543.6	512.4	+ 6.0
	15. physical-chemical basic research	528.0	519.8	+ 1.5
	administration	48.0	44.5	+ 7.8
	global minimum expenditures	-	141.1	-
Single plan 30	total	6139.7	5853.8*	+ 5.2

*without expenditures for personnel increase and without imposing a blockage of 231 million DM

Space and Oceanic Research Transport Systems

Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual amount 1978 in 1000 DM
1	2	3	4	5

Space and Oceanic Research,
Transport Systems

Preliminary remark

The following are brought out in this chapter:

1. Expenditures for promoting space and air-travel research and technology such as those resulting especially from the membership of the Federal Republic of Germany in the European Space Organization (ESA), the continuation of the space program of the Federal Republic for the years 1976 to 1979 and the 2. Total Program for Air Research and Technology of the Federal Republic for the years 1979 to 1982; furthermore the expenditures for the basic financing of the German Research and Experimental Establishment for Aeronautics and Space e.V. (DFVLR) are included here.

*Footnote numbers in margin indicate pagination of original foreign text

Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual Amount 1978 in 1000 DM
1	2	3	4	5
	2. Expenditures for supporting oceanic research and technology based on the oceanic research program of the Federal Republic.			
	3. Expenditures for research- and development programs for making available near and remote transport systems and transport technologies.			
	Expenditures			
	Savings realized in the items of the main groups 68 and 89 serve to cover expenditures in chapter 30 01, item 980.01.			
	Relevant administrative expenditures			
53201-172	Costs for participation in the International Transport Exposition 1979 in Hamburg.....	-	700	300
	Assignments and subsidies (without capital investments)			
68305-167	Support of studies in the area of space research and technology..... Payments can be made in amounts of 1,000,000 DM Obligated funding....4,200,000 DM due in fiscal year 1981.	4,900	4,600	4,431

Explanations

To item 683 05

In order to make timely and sufficient preparations for the planned space flight projects (research- and application satellite systems as well as space probes, SPACELAB) expenditures are provided for studies in the areas:

1.	scientific missions.....	1,500,000 DM
2.	SPACELAB utilization.....	1,500,000 DM
3.	geophysics, earth reconnaissance.....	400,000 DM
4.	communication satellites.....	1,300,000 DM
5.	other.....	200,000 DM
Total.....		4,900,000 DM

To a limited extent expenditures can also be made for project attendance and the promotion of exchanges of experience.

Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual amount 1978 in 1000 DM
1	2	3	4	5
68306-167	Support of space-flight technological preliminary development The payments can be made in amounts of 3,500,000 DM Obligated funding.....20,000,000 DM of which are due: fiscal year 1981 up to...12,000,000 DM fiscal year 1982 up to... 7,000,000 DM fiscal year 1983 up to... 1,000,000 DM	22,500	23,000	23,555
68307-167	Utilization of space laboratories for application-oriented material research and methods technology as well as economical purposes.....	34,000	34,000	19,849
	The payments can be made in amounts of 1,000,000 DM. The expenditures in items 683 07, 683 09, and 685 01 are mutually guaranteed up to 1,000,000 DM. Obligated funding.....50,000,000 DM of which are due: fiscal year 1981 up to...10,000,000 DM fiscal year 1982 up to...15,000,000 DM fiscal year 1983 up to...20,000,000 DM fiscal year 1984 up to... 5,000,000 DM			

Explanations

To item 683 06

In order to enable the Federal Republic of Germany to take part in the progressive technological solutions in the conduct of space projects, research- and preliminary development projects on critical construction groups and part systems should be supported.

The program for preliminary developments in space flight technology is directed particularly to the requirements of the European and international space flight activities.

The expenditures can also be made for the procurement of instruments and the construction of test installations within the framework of space-flight technical preliminary developments, for project attendance, and for the exchange of scientific experiences.

Appropriations are made for projects in the areas:

1.	communication transfer and data processing.....	4,100,000 DM
2.	energy supplies and heat conservation	2,900,000 DM
3.	instrument and control systems	2,400,000 DM
4.	construction methods and structures	3,700,000 DM
5.	technology for orbital systems	5,600,000 DM
6.	technologies for developing countries.....	3,800,000 DM
Total.....		22,500,000 DM

To item 683 07

At the European Space Conference on 12/20/1972 the construction of SPACELAB was decided (compare explanations to item 686 01) whereby the Federal Republic of Germany assured itself of participation in the progressive space technology dictated by the USA during the eighties.

Beyond that in order to enable the Federal Republic of Germany to avail itself of the new application potentials of the space

laboratory, it is necessary to develop useful experiments and their associated instrumental equipment for SPACELAB missions, especially for investigations in the area of user-oriented material research and methods technology as well as for economic purposes.

Expenditures are appropriated for:

1.	experimental programs	16,400,000 DM
2.	pilot projects	17,600,000 DM
Total		34,000,000 DM

Expenditures for the scientific utilization of the SPACELAB are listed in items 683 09 and 685 01.

The expenditures may also be made for preparatory efforts, the installation of equipment, the construction of test-, prototype-, and reference installations, project attendance, the exchange of scientific experiences, and for publications insofar as they are required within the framework of the operations to be carried out for the development of the useful experiments.

Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual amount 1978 in 1000 DM
1	2	3	4	5
68309-167	Support of earth reconnaissance, Physics of the Earth, atmospheres, and climatic research.....	13,800	11,600	8,914
	Payments can be made in amounts of 600,000 DM.			
	The expenditures in items 683 09, 683 07, and 685 01 are mutually guaranteed up to 1,000,000 DM.			
	Obligated funding..... 28,000,000 DM of which are due: fiscal year 1981 up to...10,000,000 DM fiscal year 1982 up to... 8,000,000 DM fiscal year 1983 up to... 6,000,000 DM fiscal year 1984 up to... 4,000,000 DM			

Explanations

To item 683 09

Earth reconnaissance from space is a problem for international cooperation because of the earth-circling space vehicles used, because of worldwide gain in information, and because of legal problems in which the Federal Republic, among others, will participate within the framework of the united nations. Initially the utilization of SPACELAB as a carrier of instruments which are provided by the individual ESA members, forms the center point of program planning in Europe.

Satellites also prove to be important technological aids for capturing, by geodetic measurements and fine-scale measurements of gravity, geophysical,

glaciological, and geological phenomena and their changes. Closely associated therewith is the question of predictability of earthquakes. The relevant research is advocated by the International Union for Geodetics and Geophysics (UGG).

Actual and presumed fluctuations of the climate caused by exhaust gases are increasingly becoming a part of the national and international public interest. Such investigations are presently recommended, among others, to the Federal Republic by the Space Organization for Meteorology (WMO) and require, among others, large-space long-duration measurements. Earth-circling satellites and space stations are suitable for this type of climate research as instrument carriers for probing the atmosphere. Appropriate programs for the projected cited problem areas are already being conducted, among others, by the NASA and are being prepared by the ESA. Both avenues are open for German participation. The following are suggested for German participation in research projects and instrument development:

1.	photogrammetry and remote reconnaissance of the earth for geography, geology, land and forest economics, land utilization, and oceanography.....	8,600,000 DM
2.	physics of the solid earth.....	1,000,000 DM
3.	physics of the ocean and the polar ice.....	2,500,000 DM
4.	physics of the atmosphere.....	1,700,000 DM
Total		13,800,000 DM

The expenditures can also be made for preparatory efforts, testing of methods and equipment, project attendance, and for the exchange of expert experiences.

Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual amount 1978 in 1000 DM
1	2	3	4	5
685 01-167	Support of extraterrestrial basic research.....	31,000	29,000	22,249
	The payments can be made in amounts of 1,000,000 DM. The expenditures in items 685 01, 683 07, and 683 09 are mutually guaranteed up to 1,000,000 DM			
	Obligated funding.....52,000,000 DM of which are due: fiscal year 1981 up to...15,000,000 DM fiscal year 1982 up to...18,000,000 DM fiscal year 1983 up to...14,000,000 DM fiscal year 1984 up to... 5,000,000 DM			

Explanations

To item 685 01

Based on an agreement with the German Research Association of 29 January 1964 support is being offered for the planning and preparation of scientific space flight programs and projects of the association, the development and the use of instruments in the area of biomedicine (tests with living organisms), geophysics, physics of the atmosphere, astronomy and astrophysics which can be brought to their extraterrestrial measuring station by means of altitude-search rockets, satellites, space probes, and space stations; also included are the scientific evaluation of the thus obtained data and, to a limited extent, the analysis of materials from outside the earth.

The cited projects serve to

- expand nature-scientific information which is basic not only for the

sciences of the mind and of society, but also for applied research;

- the investigation of extreme requirements made of technological research, development, and management;
- the partial financing of the scientific ESA program and German scientific research installation (Max Planck Society for the Promotion of Science, eV, Fraunhofer Society for the Promotion of Applied Research, eV. and technical colleges);
- the scientific-technological cooperation with other countries and their organizations (e.g. NASA). At the same time these endeavors are intended to check effective methods for inter-disciplinary cooperation.

For 1980 the following are planned:

1. special means for the German Research Association, eV. for supporting various individual projects (laboratory investigations, balloon experiments, observations from the ground, evaluation of non-German space flight experiments.....	1,500,000 DM
2. participation in projects of the ESA and NASA (development and construction of scientific instruments, data evaluation).....	11,000,000 DM
3. scientific utilization of space laboratories (preparation, development, and construction of the scientific instrumentation and their pre-integration, data evaluation).....	10,500,000 DM
4. altitude research rockets - extensive programs in international cooperation and, in part, in conjunction with satellite projects of the ESA and NASA (development and construction of useful experiments, rocket procurement, conduct of the campaigns, investments necessary for program conduct, data evaluation).....	6,000,000 DM
Total	29,000,000 DM

Items 2 and 4 contain expenditures for modernization and expansion of scientific installations which serve for extraterrestrial exploration as well as project-caused additional expenditures of the mobile rocket base of the DFVLR (German Society for Air and Space Research) which conducts the high-altitude research rocket campaigns. The expenditures may also be made for preparatory projects, project attendance, and the exchange of scientific experiences.

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Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual Amount 1978 in 1000 DM
1	2	3	4	5
685 09-167	Additions for the operation of test installations and ground operational installations for space flight projects.....	11,000	11,000	9,564
	Payments can be made in amounts of 1,000,000 DM.			
	Obligated funding..... 5,500,000 DM			
	of which are due:			
	in fiscal year 1981 up to...2,500,000 DM			
	in fiscal year 1982 up to...2,000,000 DM			
	in fiscal year 1983 up to...1,000,000 DM			
686 01-167	Contribution for performance payments to the European Space Organization (ESA) in Paris.....	400,000	397,000	375,000
	Payments can be made in amounts of 20,000,000 DM			

Explanations

To item 685 09

The expenditures are slated for the operation of test installations and ground operation installations within the framework of the development and testing and utilization of space vehicle equipment as well as the exchange of scientific experiences. These are essentially:

a) development tests, functional tests, and acceptance tests insofar as they do not relate to specially planned projects,

b) orbit determination, remote control and measurement,

c) preparation and processing of data.

These expenditures are particularly intended for payments of the not covered operational costs of the central space test laboratory constructed by the association at the Industrieanlagen-Betriebsgesellschaft mbH (IABG) in Ottobrunn near Munich.

Furthermore these funds were used to pay utilization costs for the use of installations and equipment of other countries and international organizations as well as costs of project attendance.

1.	project-related operating costs for space flight projects HELIOS, SYMPHONIE, and TV-SAT, as well as cooperative projects with NASA (Galileo and AMPTE).....	3,500,000 DM
2.	costs of data processing for the space flight projects HELIOS, SYMPHONIE, SPACELAB - utilization.....	1,600,000 DM
3.	operating and repair costs, among others, for installations of the IABG.....	5,900,000 DM
Total		11,000,000 DM

To item 686 01

In 1975 the unified European space organization European Space Agency (ESA) took the place of the then existing space organizations ESRO - European Space Research Organization - and ELDO - European Organization for the Development and Construction of Space Vehicles.

The establishment of the ESA introduced a new phase in European space collaboration in that it removed the then existing "parallel existence" of two independent space organizations. After the signing of the ESA agreement on May 30, 1975 ESRO and ELDO have become active as a unified organization under the name of ESA. In this way a "de facto" founding has been accomplished.

Formally the agreement will take effect only after ESRO, resp. ELDO member countries Great Britain, France, the Federal Republic of Germany, Italy, Netherlands, Belgium, Switzerland, Sweden, Denmark, Spain, and Ireland have ratified the agreement. As far as the Federal Republic of Germany is concerned the agreement was accepted on November 23, 1976 by law -BGBl.II 1976, page 1861- and was ratified on July 26, 1977.

ESA has taken over all programs which were conducted by ESRO. In addition to the scientific programs these are the development of the application satellites METEOSAT (meteorology), TELECOM and ECS (news transmittal) as well as MARECS (oceanic news), also the development of the space laboratory SPACELAB as well as the carrier rocket ARIANE. Additionally an earth reconnaissance satellite program is being prepared.

On April 15, 1975 the European Space Conference decided on European co-financing of the French rocket starting installation in Kourou. The fixed German contribution of a total of 50,000,000 DM will be made available in the years 1976 to 1980 with 10,000,000 DM per year.

The ESA has also established as a goal the coordination and integration of the various national space programs within a European framework. The most important task assigned to the European space agency is the preparation of suitable industry politics in order to increase in this way the international competitive capability of the European space industry. In addition the national space institutions shall be drawn to an increasing degree into the conduct of ESA programs. ESA has 1500 permanent co-workers.

1. The expenditures of the ESA will come in 1980 to 620 million European accounting units (RE). The Federal Republic of Germany takes part in the individual endeavors with the following amounts and contributions:

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Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual amount 1978 in 1000 DM
1	2	3	4	5
893 15-167	Expenditures for investments development, construction, and test operation of communication satellites.	74,600	29,800	34,448
	Expenditures in the amount of 6,000,000 DM require the consent of the budget committee of the German Bundestag (Congress)			
	Obligated funding.....185,000,000 DM of which are due: in fiscal year 1981 up to...65,000,000 DM in fiscal year 1982 up to...80,000,000 DM in fiscal year 1983 up to...40,000,000 DM			

Explanations
(still to item 686 01)

general budget (without Kourou) 25.57%	30,400,000 DM
scientific program 25.57%	58,900,000 DM
earth reconnaissance 25.57%	3,700,000 DM
METEOSAT F 1 25.66%	4,100,000 DM
METEOSAT operation 25.66%	3,400,000 DM
TELECOM phase 2 25.89%	5,300,000 DM
ECS 30.68% (phase 3 Telecom)	32,500,000 DM
ECS 30.42% (phase 3A Telecom)	12,200,000 DM
MARECS A 19.08%	3,600,000 DM
MARECS B 13.29%	9,200,000 DM
SIRIO 2	2,000,000 DM
SPACELAB development 53.34%	160,800,000 DM
SPACELAB utilization 56.25%	9,700,000 DM
ARIANE development - fixed amount	55,900,000 DM
ARIANE procurement 20.14%	5,600,000 DM
Kourou fixed contribution	10,000,000 DM
Total	407,300,000 DM

2. The ESRO special project ESRANGE will be continued by ESA; for 1980 the total expenditures are estimated to be 3.2 million RE (European accounting units). The German contribution to the maintenance costs for the launching stations for high-altitude research rockets in Kiruna, Sweden and Andoya, Norway are tentatively set at 2.7 million DM.

3. ESA has erected a ground station for geo-stationary satellites near Michelstadt in the Odenwald forest. The costs, estimated to be about 9 million DM, for purchasing the land and closing costs as well as for the changeover of directional sending installations will be born by the Federal Republic of Germany as a special contribution.

The exchange rate for the German contributions is 1 RE = 2.57276 DM.

Additionally provisions must be made for:

1.	contribution to the ESA budget	407,300,000 DM
2.	contributions to the ESA special project ESRANGE	2,700,000 DM
3.	special contribution for ESA ground station	- DM
Total		410,000,000 DM

More because of the increase in expenditures for continuing programs (science program ECS) as well as for the new endeavors TELECOM phase 3 and SIRIO 2.

To item 893 15

In view of the at present prominent market in the area of communication satellite systems for remote announcement systems, beaming of radio and television signals, communication and surveillance tasks in air- and ocean traffic, communication satellites will take on increased importance in the future.

1.	experimental demonstrations within the framework of the "utilization program SYMPHONIE" and operating costs of the earth station as well as remaining winding-down of the development program "Symphonie"	1,100,000 DM
2.	development and test of modular-design satellite partial systems and receiving stations as well as relay methods for future communication satellite systems, especially for a TV satellite	6,100,000 DM

3. development and demonstration of experimental and operational ship equipment for oceanic satellite transmitting systems	500,000 DM
4. development, fabrication, starting, and putting into operation of a pre-operational television transmission satellite system	66,800,000 DM
Total	74,500,000 DM

Expenditures may also be made for project attendance and the national and international exchange of scientific-technological experiences.

To 1:

As a first project the remote-communication satellite "SYMPHONIE" was developed in conjunction with France (agreement with France of June 6, 1967). It serves for experimental transmission of television programs and telephone conversations as well as the examination of a novel multiple access process (TDMA). "SYMPHONIE" above all demonstrates the performance capability of European industrial enterprises in this economically important area. Furthermore the prerequisites for future communication satellites will be provided by the technical designs, pointing to the future, of the satellites.

To 2:

Building on the experiences gained from the project "SYMPHONIE" and the ESA projects "OTS" and "MARECS" , modular multiple-use functional models of individual satellite part systems and small ground stations including transmission methods for future communication satellites (ZKS) will be developed and their functional capability will be demonstrated. In this way the competitive capability of the German electronics- and space industry should be supported.

To 3:

At the end of 1975 the first world-wide maritime satellite system (MARISAT) started operational and commercial operation. Already numerous ships have been equipped with appropriate ship stations. This support should help to secure for the German industry a significant share of the market of ship transmitting installations.

To 4:

Along with the BMP and the legal public broadcasting installations, as per agreement, an experimentally used television broadcasting satellite system shall first be established in the Federal Republic of Germany. For this purpose the BMFT will prepare a television broadcasting satellite in a geo-stationary orbit and a number of home receiving stations for individual and community reception. The BMP is responsible for the technical operation of the system and for the earth transmission station.

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Item and function	Determination of purpose	Amount for 1980 in 1000 DM	Amount for 1979 in 1000 DM	Actual amount 1978 in 1000 DM
1	2	3	4	5
893 20-167	Increased investment costs for support of extra-terrestrial basic research.....	19,800	18,000	13,000
	obligated funding..... 70,000,000 DM			
	of which are due:			
	in fiscal year 1981 up to...18,000,000 DM			
	in fiscal year 1982 up to...30,000,000 DM			
	in fiscal year 1983 up to...20,000,000 DM			
	in fiscal year 1984 up to... 2,000,000 DM			

Explanations
(still for item 893 15)

1	program for 1. DM 2	program for 2. DM 3	program for 3. DM 4	program for 4. DM 5	total DM 6
provisional total expenditures according to 1979 budget	325,259,964	220,260,632	28,207,621	-	573,728,217
supplement	- 2,200,000	-97,600,000	-6,700,000	308,000,000	201,500,000
total[1]	323,059,964	122,660,632	21,507,621	308,000,000	775,228,217
paid 1967 to 1978	317,859,964	100,760,632	16,207,621	-	434,828,217
permitted for 1979[2]	3,500,000	14,500,000	3,800,000	8,000,000	29,800,000
remaining expenditures carried over after 1979	-	--	-	850,000	850,000
totals	321,359,964	115,260,632	20,007,621	8,850,000	465,478,217
remaining	1,700,000	7,400,000	1,500,000	299,150,000	309,750,000
planned for 1980	1,100,000	6,100,000	1,000,000	66,800,000	75,000,000
held up	600,000	1,300,000	500,000	232,350,000	234,750,000
planned for					
1981	600,000	600,000	500,000	84,400,000	86,100,000
1982	-	700,000	-	103,000,000	103,700,000
1983	-	-	-	44,950,000	44,950,000

1) with reference to column 2: of that 300,000,000 DM as the share of the budget of the German-French remote-communication satellite project. According to the financial agreements the costs of a total of 600,000,000 DM will be financed at one half each by the Federal Republic of Germany and by the Republic of France. 23,059,964 DM for national projects in connection with the "SYMPHONIE" project.

2) with reference to columns 3 and 5: the deviation from the 1979 budget was caused by program changes.
Reasons for the supplement: acceptance of the new program for 4. and adaptation to the program- and cost development.

To item 893 20

1. Helios A and B

On June 10, 1969 an agreement was made with NASA for the joint conduct of the project "Helios". The scientific goal is the investigation of the solar plasma and the interplanetary matter up to distances of about 50 million kilometers from the sun. The solar probes HELIOS A and HELIOS B were launched from Florida on December 10, 1974 resp. on January 15, 1976 by the American carrier rockets of the type Titan/Centaur into an elliptical orbit around the sun. Both probes were developed and built in Germany. In each case 7 of the 10 experiments were supplied by the German Research Institute. Both probes are operated by the control center of the DFVLR (compare item 685 55) with the use of German and American ground stations.

Scientific goal formulation:

1.1 Investigation of the dynamics of the solar wind and the interplanetary magnetic field.

1.2 Measurement of the cosmic radiation of solar and galactic origin.

1.3 Investigation of the spatial distribution and chemical composition of the interplanetary dust (7 German experiments, 3 NASA experiments).

The project will continue (including data evaluation) till 1983.

2. Utilization of space-shuttle insertions

In 1977 an agreement was concluded with NASA regarding the conduct of a project Jupiter probe ("Galileo"). The goal is the investigation of the Jupiter atmosphere and of the moons of this planet. The German contribution consists of the preparation of experiments (including data evaluation) and the propulsion system which must guarantee the positioning of the probe around the planet Jupiter. The start is planned for 1981/1982.

3. SPACELAB utilization for scientific projects

Participation n the European SPACELAB utilization program and in the SPACELAB flights, offered by NASA, with useful experimental packages as well as preparation of our own SPACELAB missions within the framework of extraterrestrial research.