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PRESENT STATUS AND TRENDS FOR FUTURE DEVELOPMENT
OF THE BULGARIAN
SHIPBUILDING AND SHIPREPAIR INDUSTRY*

by

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1. SCOPE OF THE REPORT

The main purpose of the report is to present a most general information of the development of the shipbuilding and ship-repairing industry in the People's Republic of Bulgaria, for the participants of the Subregional Workshop on Shipbuilding, Ship Repair and Design for Mediterranean Countries.

Taking into account the fact, that the period of development, covered by Bulgaria, might prove to be interesting for some of the developing countries which are faced with similar stages of development, it was estimated useful to make a short historical review, although the stress is layed on the present condition and the trends of future progress.

2. A SHORT HISTORICAL REVIEW OF THE DEVELOPMENT OF SHIPBUILDING AND SHIP REPAIR IN BULGARIA

Although the metal shipbuilding in Bulgaria dates from the end of 19th (a small workshop in the town of Rousse, on the Danube river) and the beginning of the 20th century (a small workshop in the town of Varna at the Black Sea), as a beginning of the shipbuilding of modern type is accepted the year of 1937, when the State Shipyard in Varna (established in 1907) delivered the first self-propelled metal ship "Galata", built on a design of Bulgarian shipbuilding engineers - a 60-seat coastal passenger ship.

This marks the beginning of a 40-years historical period in the development of the Bulgarian shipbuilding.

If the first wooden selfpropelled ship, of Bulgarian design could be taken as a beginning, then the Bulgarian shipbuilding dates from 1898, when the Rousse shipyard manufactured the military sea cutter "Kalliacra" with a length of 23m and a speed of 9 knots.

The poor economic and scientific technical potential of the country, and the primitive necessary equipment of the small

shipyards, however, did not allow development of a serious shipbuilding activity till the victory of the socialist revolution in 1944, when in unison with the dynamic development of the national economy, suitable conditions were created for an accelerated development of the shipbuilding and shiprepairing industry. And as the facts confirm, the highest value of the output tonnage, reached during the pre-revolutionary period, was the output of 1942 when a total tonnage of 6500 tdw was produced, the larger part of which, being non-propelled vessels; while in 1978, the total tonnage, produced, amounts to about 400,000 tdw, including modern types of ships at a high technical level. The increase of more than 60 times of the tonnage, produced, together with the essential structural and quality changes, is connected with the implementation of a purposeful programme for a complex development of the shipbuilding and ship repairing in Bulgaria, which becomes evident from appendix No. 1 - "Basic Stages of the Development of Bulgarian Shipbuilding in the Period 1937 - 1978".

Summarising, for the main factors, conducive to the dynamic recent development of the Bulgarian shipbuilding and ship-repairing industry, the decisive role of the following of them could be marked as a conclusion of this section:

- The permanent economic progress of the country, imposed a rapid development of the foreign trade exchange (effected mainly on water ways) and stimulated an essential growth of the needs for national sea and river fleet, by reason of which, the Bulgarian shipbuilding was organised to supply the main part of the necessary ships. The rest were supplied from other countries by export of goods and industrial specialisation. Beginning from 1911, because of the perishing of all (although few in number) Bulgarian merchant ships during II World War, the present merchant sea fleet has more than 150 ships with a total tonnage of more than 1 mln tdw; the total displacement of the river fleet exceeds 250 thousand tons;

- during the period of 1965 - 1975 a significant ocean fishing fleet was created, including mainly great - and middle - tonnage ocean trawlers and fishing vessel base-ships which were imported mainly through bilateral cooperation with the shipbuilding of USSR, Poland and East Germany;
- the needs of maintaining the merchant and fishing vessel fleet imposed the creation and a further development of new ship repairing capacities;
- the industrialisation of the country provided on one hand a permanent increase of the relative part of the Bulgarian materials and products, used by the shipbuilding and on the other hand, the shipbuilding itself forced the adoption and perfection of a number of products of the machine-building, electrotechnical, electronic, chemical and other industries. This led to proportions, necessary for an effective and economically grounded shipbuilding and ship-repairing activities in the country;
- the all-embracing programme for training of executive, engineering and scientific staff in national scale and in the system of the shipbuilding made possible the creation of a scientific, technical, design and personnel base, thanks to which reconstruction and modernisation of the shipyards and design and construction of new works were carried out, started the production of modern ships and ship equipment and nowadays the achievements are on the level of the highest world standards;
- the active cooperation on multilateral and bilateral base allowed to study and apply permanently the experience of the advanced shipbuilding countries and to achieve in short terms their production and their scientific and technical level;

- the complex development of the shipbuilding turned it into significant export branch, and the ships and ship equipment became an important item of export to many countries. This allowed PRB to find supplementary possibilities for realizing the investment policy and to ensure the necessary financial and other resources, etc.

3. PRODUCTION FACILITIES AND PROGRAMME OF THE SHIPBUILDING AND SHIPREPAIR YARDS

The shipbuilding and shiprepair industry of PRB includes 12 shipbuilding and shiprepair yards and works for ship equipment. This branch of the industry is soundly provided with scientific and design service.

The shipyards and 6 works for ship equipment are part of the State Economic Enterprise "Bulgarian Shipbuilding Industry" with head office in Varna. The shiprepair yard in Varna is at the State Economic Enterprise "Water Transport", and the shiprepair yard in Bourgas - at the State Economic Enterprise "Fishing Industry" Bourgas.

Specialized production of ship equipment mainly is organized in 6 works. These works are territorially situated in close proximity to the shipbuilding centres. Considerable production of ship equipment is carried out in the well developed machine-building departments of the shipyards in Varna and Bourgas.

The shipbuilding and shiprepair yards besides that, have developed co-operation with more than 100 other works, from which they receive shipbuilding steel, plastics and painting materials, generators, compressors, electric drives, radio locators, automated systems, pumps, hydraulic elements, forgings, castings, air condition installations, ventilators, boilers, etc.

A number of ship equipment and machinery are produced for export, within the range of bilateral and multilateral specialization, which allows supply from abroad main ship engines, certain types

and sizes of shipbuilding metals and other not produced in the country items of ship equipment

The shiprepair yard in Varna, which has dry dock with capacity up to 50,000 tdw and 2 floating docks with lifting capacity of 25,000 tdw is specialized mainly for repair of transport (cargo and passenger) ships. The shiprepair yard in Bourgas, equipped with a lifting device with capacities up to 8,000 tdw and floating dock up to 4500 tdw is specialized for repair mainly of fishing vessels.

The shiprepair capacities of the country are insufficient and that is way the services of some Mediterranean countries are used.

For the shipyards, regardless of some concrete differences and peculiarities, the following characteristic features are valid:

- Application of up-to-date technological methods for assembly of block units with high rate of preliminary equipment. Their net weight for the Bourgas and Bourgas shipyards reaches 100 t, and for the Varna shipyard - up to 800 t;
- availability of flow production lines for pre-assembly preparation hull works and for assembly work of section units;
- high level of mechanization and automation of the production processes;
- application of high productive technological methods for pipe working and other completion works;
- short cycles of building a ship;
- application of highly efficient materials, etc.

A characteristic feature of the Bulgarian shipbuilding in the last 10 years are the ships built in big series (some of them of more than 50 ships). This is shown in Table No. 1.

Table No. 1

Ships built in big series in the period 1968 - 1978 in PRB

No.	Type of the ship	Deadweight tdw
1.	Tanker	100,000
2.	Coal-ore-carrier	38,000
3.	Bulk carrier	25,000
4.	Coal-carrier	10,000
5.	Dry cargo carrier	6,000
6.	Tanker	5,000
7.	Bunker-ship for fluid fuel	3,000
8.	Bunker ship for fluid fuel	1,500
9.	Dry cargo carrier	1,500/2,500
10.	River pushbargefleet	-
11.	Floating hotels	-
12.	Floating workshops	-

The high quality of the produced ships, the reputation gained and the favourable conjuncture on the world market made it possible to export about 60 - 70% of the ships, build in the period 1960 - 1978.

Ships were mainly exported to such advanced countries with industrial experience and good traditions in shipbuilding and navigation as the USSR, Poland, England, USA, Germany, Norway, etc.

Concerning the worsened conjuncture, measures are taken to renew the production and to widen the nomenclature of the offered ships.

In 1980 - 1981 to Bulgarian fleet and for export the following types of ships will be offered, shown in Table No. 1 and in Table No. 2.

Table No. 2

Ships, which are to be built by the Bulgarian
shipyards in 1979 - 1981

No.	Type of the ship	Deadweight
1.	Modified ore-coal carrier	38,000
2.	Modified bulk-carrier	25,000
3.	Product carrier	25,000
4.	Multipurpose ship	25,000
5.	Universal cargo ship	15,000
6.	Container ship for 400 containers	14,000
7.	Product carrier	6,000
8.	Tanker	2,000
9.	Push barge fleet with pushboat 3150 p.h.	-
10.	Push barge fleet with pushboat 1400 p.h.	-

4. SCIENTIFIC - TECHNICAL AND DESIGN STAFF SERVING SHIPBUILDING
AND SHIPREPAIR

In Bulgaria there are research centres and design institutes, solving a wide range of problems in a complex manner. In fact, there is no scientific problem, which can not be solved by our own efforts or by the organised international cooperation.

Information about the research and design institutes, serving shipbuilding and shiprepair in our country is given in Table No. 3.

Table No. 3

Main research and design institutes serving shipbuilding
and shiprepair

No.	Institute, town	Basic matter of activity
1.	BSHC and other 14 scientific organizations forming a national integrated system for research, design and staff training in the field of shipbuilding and marine industry.	Complex hydrodynamic model experiments and tests, education of technical and scientific staff, experts' proposals and research and design work for the development of shipbuilding and marine industry.
2.	Research and design institute in Varna	Research and design of ships and ship equipment and technological design of shipyards.
3.	Shipbuilding computer centre, Varna	Computer aided design and optimization of management and computer processing of economic data.
4.	Research and design institute "Mashelectroproject", Sofia	Design of shipyards, dockyards and shipmachinery plants.
5.	Research and design institute "Transproject", Sofia	Research and design of docks, quays and other hydrotechnical sea and river facilities.

Almost all shipyards, dockyards and ship-machinery plants have their own well developed design and technical bureau for efficient service of the production.

A number of specialized scientific and development organisations from the national economy departments, cooperate with shipbuilding are used to solve many problems, concerning ship systems, installations and devices.

The results of the research and design activities of the institutes can be illustrated by the appropriate photographs. In this way additional information about shipbuilding would be given.

The availability of well-developed scientific and design basis, which exceeds the needs of Bulgaria, permits the realisation of a wide international co-operation, scientific-technical exchange and performance of scientific and design services, meeting the needs of other countries.

5. BASIC TENDENCIES OF FUTURE DEVELOPMENT

In summary, the basic tendencies in future development may be characterized in the following way:

- To complete the reconstruction of the shipyards in Russe and Bourgas and the construction of the dockyards in Varna and Bourgas and to overcome the existing internal disproportions of the production-technical basis up to the end of 1980;
- to complete modernization of the shipmachinery plants in Shumen, Novi Pasar and Turgovishte in the period 1980 - 1981;
- to increase the automation and modernization level of the production processes;
- to widen the nomenclature and the production of new types of ships;
- to complete the computer aided design and automation of management;

- to intense research and design works in order to raise the technical level, to improve the technical performance of ships and ship equipments and to improve the technology and organization of labour;
- to improve training of scientific, engineer and executive staff and to increase the quantity and quality of the staff;
- to develop the international bilateral and multilateral scientific and production co-operation.

The appropriate programmes, taking into account the above stated tendencies of development are directed to the realisation of more competitive indices and to the improvement of economic efficiency and the role and importance of shipbuilding for national economy.

CONCLUSION

During the 40 years after the foundation of modern shipbuilding and shiprepair in Bulgaria and particularly in the last 20 years a reliable scientific-technical, design and production staff was educated. Bulgaria came close to the advanced shipbuilding countries quickly and now it possesses all the necessary prerequisites, components and basis of a modern shipbuilding and shiprepair industry.

This complex branch of national economy, which is highly efficient and is contributing much for the favourable currency-balances has a significant part in the whole dynamic economical development of Bulgaria.

The available basis and the future plans for development are a solid prerequisite for the high level of shipbuilding and shiprepair in order to meet the needs of our national fleet as well as to contribute for the further development of foreign trade and international economical and scientific-technical co-operation.

Appendix I

BASIC STAGES IN THE DEVELOPMENT OF
BULGARIAN SHIPBUILDING IN THE PERIOD
1937 - 1978

Taking into consideration principal and serious quantitative and qualitative changes, we can conditionally determine 4 basic stages in the development of Bulgarian shipbuilding and shiprepair during the past 40 years.

1. 1937 - 1944

Shiprepair, carried out by small enterprises having primitive techniques and lack of production facilities, was the predominant work. The ships repaired belonged to our own marine and river fleet which at this time had a total tonnage of 20 000 t dwt. In shipbuilding - incidental building of self-propelled ships of small tonnage up to 1 000 t dwt and predominantly - building of non-propelled ships, including ferro-concrete vessels. Here it should be mentioned that the first ship built after Bulgarian design as well as the other self-propelled ships were built after model tests in foreign towing tanks.

2. 1945 - 1956

Incorporation of small shipbuilding enterprises, reorganization and partial modernization of facilities for building of new ships took place in the traditional shipbuilding centres - Varna, Rousse, Bourgas. A transition to predominant building of self-propelled ships was observed. Passenger ships, bulk carriers and tankers up to 4 000 t dwt were built in series and at the end of the period more than 50 % of the production was for export. The end of this period is characterized by putting into operation of the dry shiprepair dock in

Varna able to repair up to 40 000 t dwt ships. The gradual increase and training of design staff and the foundation of design institutes for shipyards and dockyards was the basis for the further more dynamic development. Thanks to the comprehensive education of the national specialists /abroad, as well as in national Higher Schools as a result of the establishment of Institutes and appropriate engineer subjects/ it became possible to plan more ambitious goals.

3. 1957 - 1967

The first stage of the fundamental reconstruction and modernization of Varna shipyard "George Dimitrov" /including construction of two new shipbuilding docks/ and of Rousse shipyard and dockyard "Ivan Dimitrov" was completed. A further supply of facilities and improvement of the repairs took place in Varna dockyard. In Bourgas began reconstruction of dockyard and shipyard "Yliya Boyadjiev".

In Varna, in 1962, on the basis of a Design Office was founded the Research, Design and Technological Institute of Shipbuilding; a Laboratory - experimental basis was constructed which put the beginning of an organized purposeful research work. This permitted to start the production of new types of tankers, fishing and cargo ships and bulk carriers with tonnage up to 10 000 t dwt. The international cooperation was extended and the percentage of export production increased. Specialized ship machinery enterprises were established by reconstruction and modernization of small workshops.

Thanks to the accelerated industrialization, production contacts and cooperation with many branches of the national economy were established. A systematical study and adoption of the experience of advanced countries was organized.

4. 1968 - 1978

A further construction of the necessary equipment of shipyards took place. Technological methods at the highest world standards were worked out and introduced. They started

the production of more complicated and qualitative modern cargo ships with greater tonnage /including 25 000, 38 000, 100 000 t dwt ships/. The dockyard in Varna was enlarged and a new dockyard in Burgas, named "Dragoi Nedev" was founded. The ship machinery plants were reconstructed and modernized, thus permitting a sharp broadening of the nomenclature of ship machinery produced in Bulgaria and an increase of ship machinery export. A modern ship radar equipment plant was built. The production contacts and cooperation with other departments of the national industry, established in the previous period, were strengthened. Production of new ship machinery was started and new contacts were established. Shipbuilding turned to be the main basis for development of the national fleet and a significant export branch of the national industry. The scientific capacity was significantly increased by the establishment of a Shipbuilding Computer Centre in 1976 and the Bulgarian Ship Hydrodynamics Centre in 1977. A reform in the training of executive, technical, engineering and scientific-research staff was made. In the same time a programme for training of specialists in different scientific and technical fields was implemented, more intensive than in the previous periods and in advanced shipbuilding countries. In 1971 a cooperation with UNDP and IMCO was established, continuing until now, for implementation of a Project for further development and strengthening of the national shipbuilding scientific and research basis and design capacities.

The scientific, technical and economic cooperation with advanced countries on the field of multilateral cooperation in the framework of the Council for Mutual Economic Aid, as well as on the basis of commissions and other forms of bilateral cooperation with many countries from different world regions was put on a new qualitative basis and marked a further development.

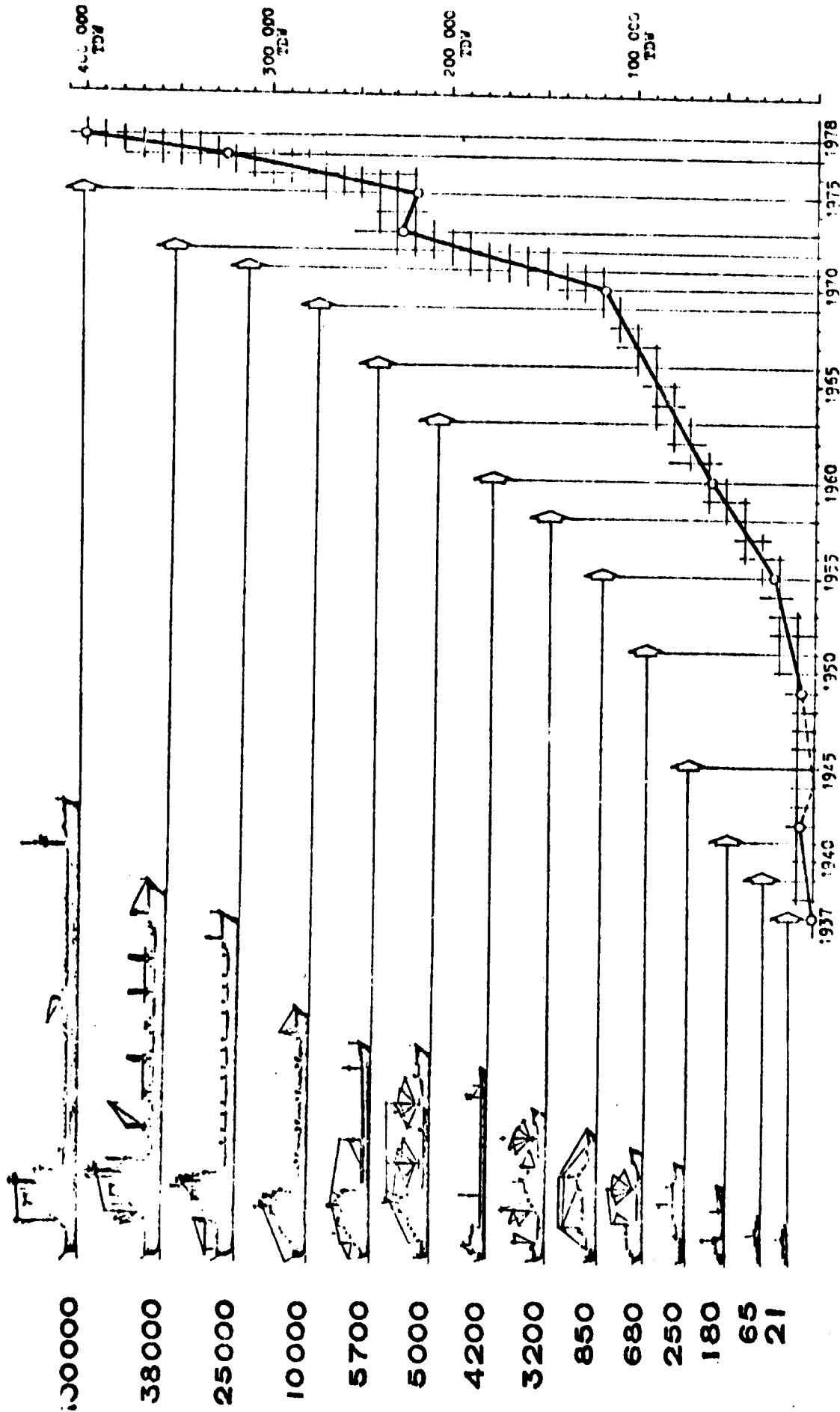
A variety of measures, including increase of the nomenclature of the ships produced and beginning of production of new perspective types of ships were taken in connection with the worsed situation on the world market at the end of this period.

* * *

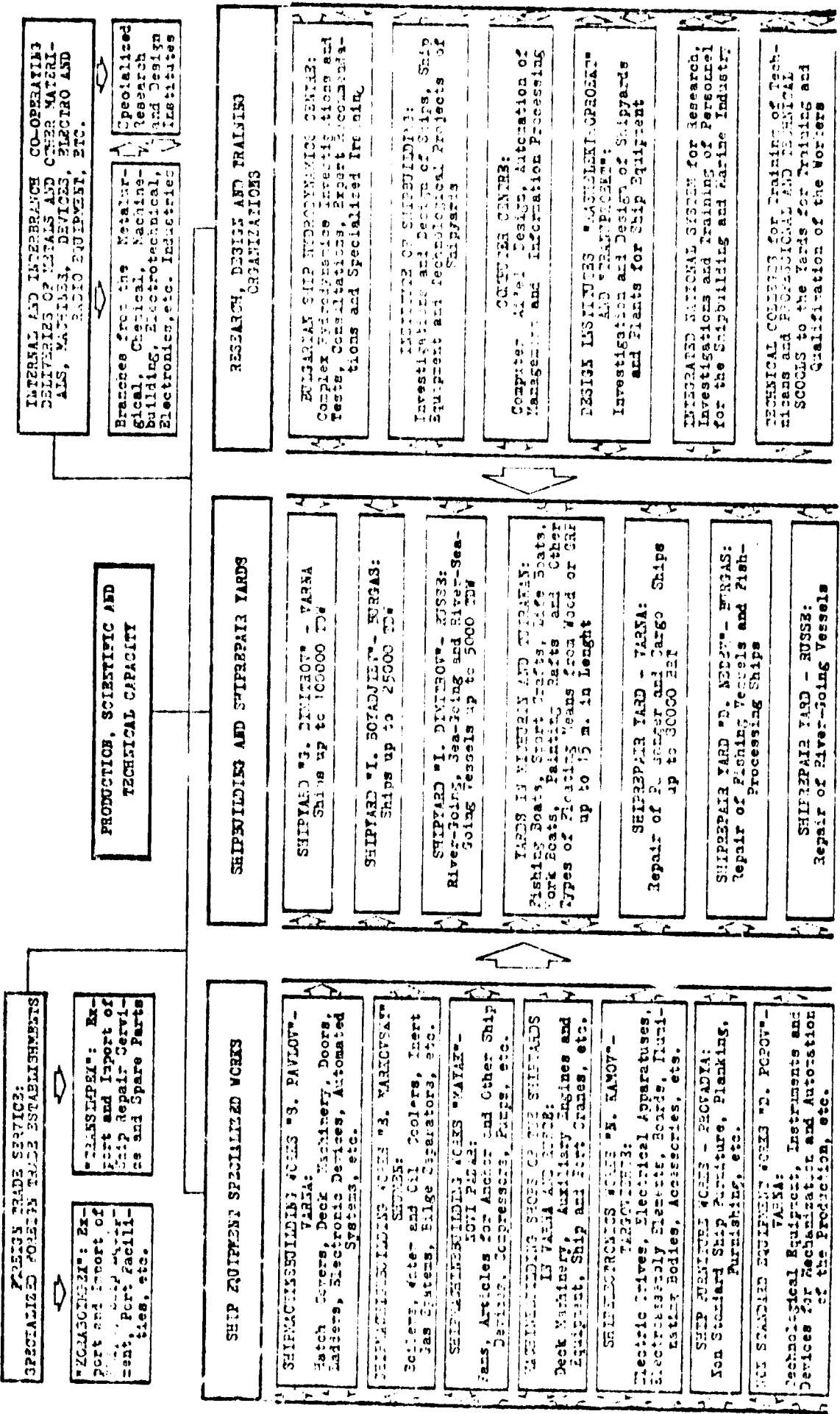
We can illustrate the dynamic development of the Bulgarian shipbuilding during the last 40 years by mentioning that the tonnage of the ships built grew from 6 500 t dwt /that was the highest achievement up to the end of World War II, reached in 1942/ to 400 000 t dwt in 1978, which is more than 60 times the achievement in 1942. This significant growth was a result of the harmonious and planned development as well as the improvement of production structure. This process was also stimulated by the dynamic development of national fleet which can be illustrated by the following data: tonnage grew from 13 000 t dwt in 1948 to 1 000 000 t dwt in 1978 /e.g. nearly 80 times increase in a 30 years period/, meanwhile the merchant fleet was renewed more than three times.

In conclusion it can be mentioned that the progressive development of shipbuilding in the latest 40 years was accompanied by the solution of many problems, which showed, on one side that the shipbuilding is a mirror of the dynamic all-round economic development of our country and, on the other side, that the shipbuilding is a contributor to that development. On that basis we have defined our short-term and long-term goals and plans for further progressive development.

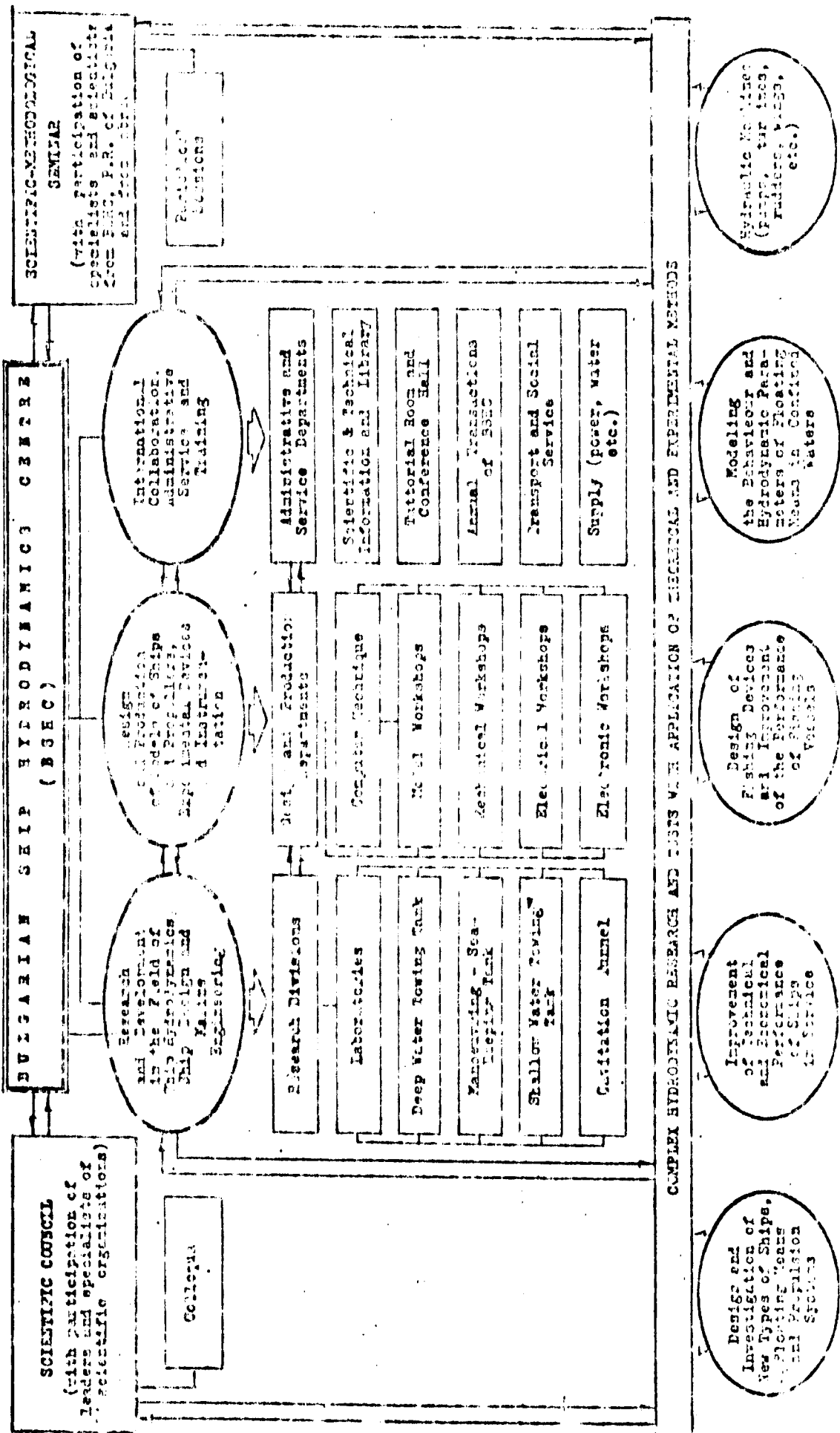
DEVELOPMENT OF THE BULGARIAN SHIPBUILDING INDUSTRY
 RISE OF THE BIGGEST MULTI SEERS
 (in TDV units)



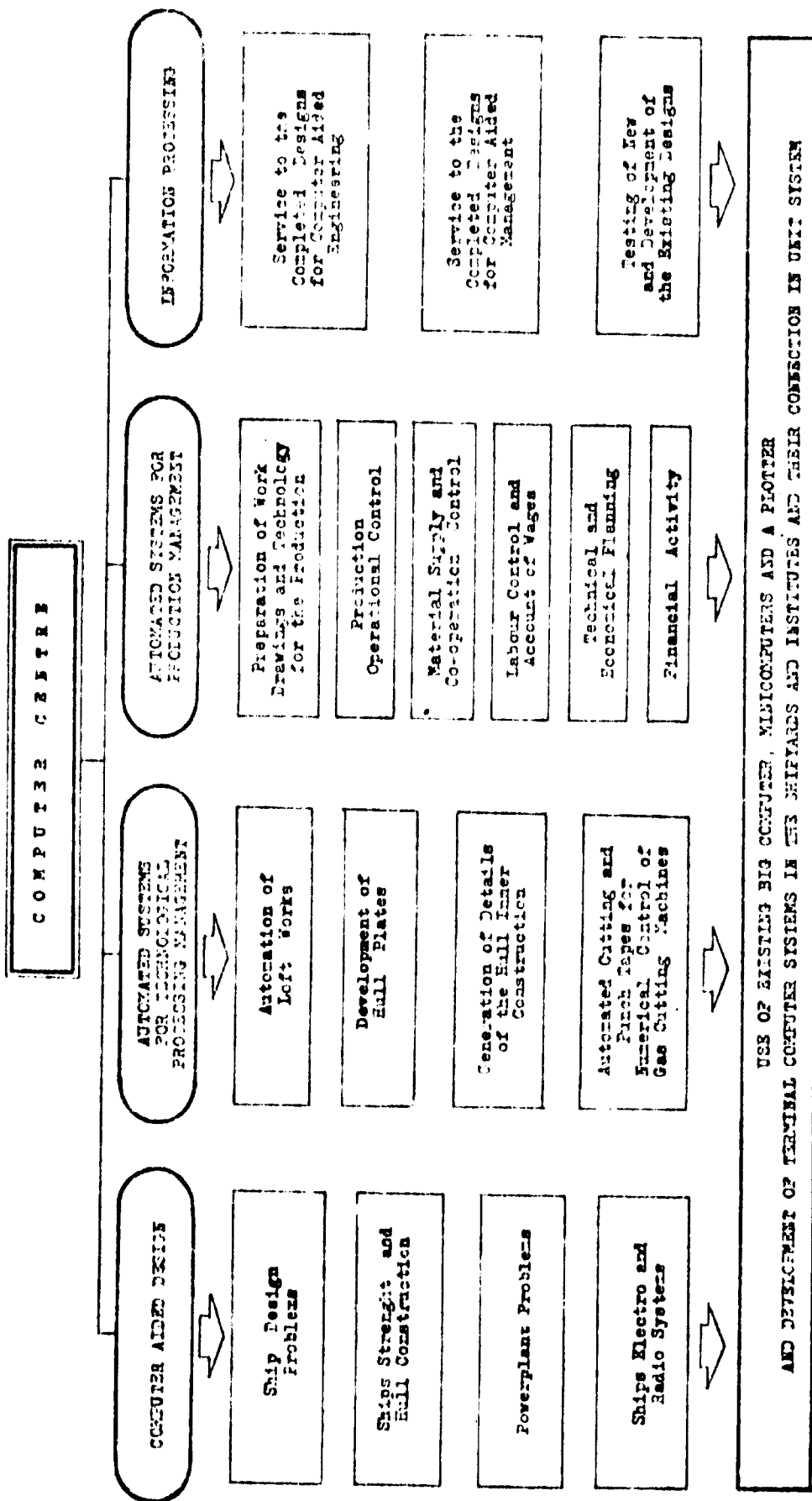
BLOCK SCHEME OF THE FIELD OF ACTIVITIES AND SPECIALIZATION OF THE BULGARIAN SHIPBUILDING AND SHIPREPAIRING INDUSTRY



STRUCTURAL SCHEME FOR THE OBJECT AND FIELD OF SHIP ACTIVITIES

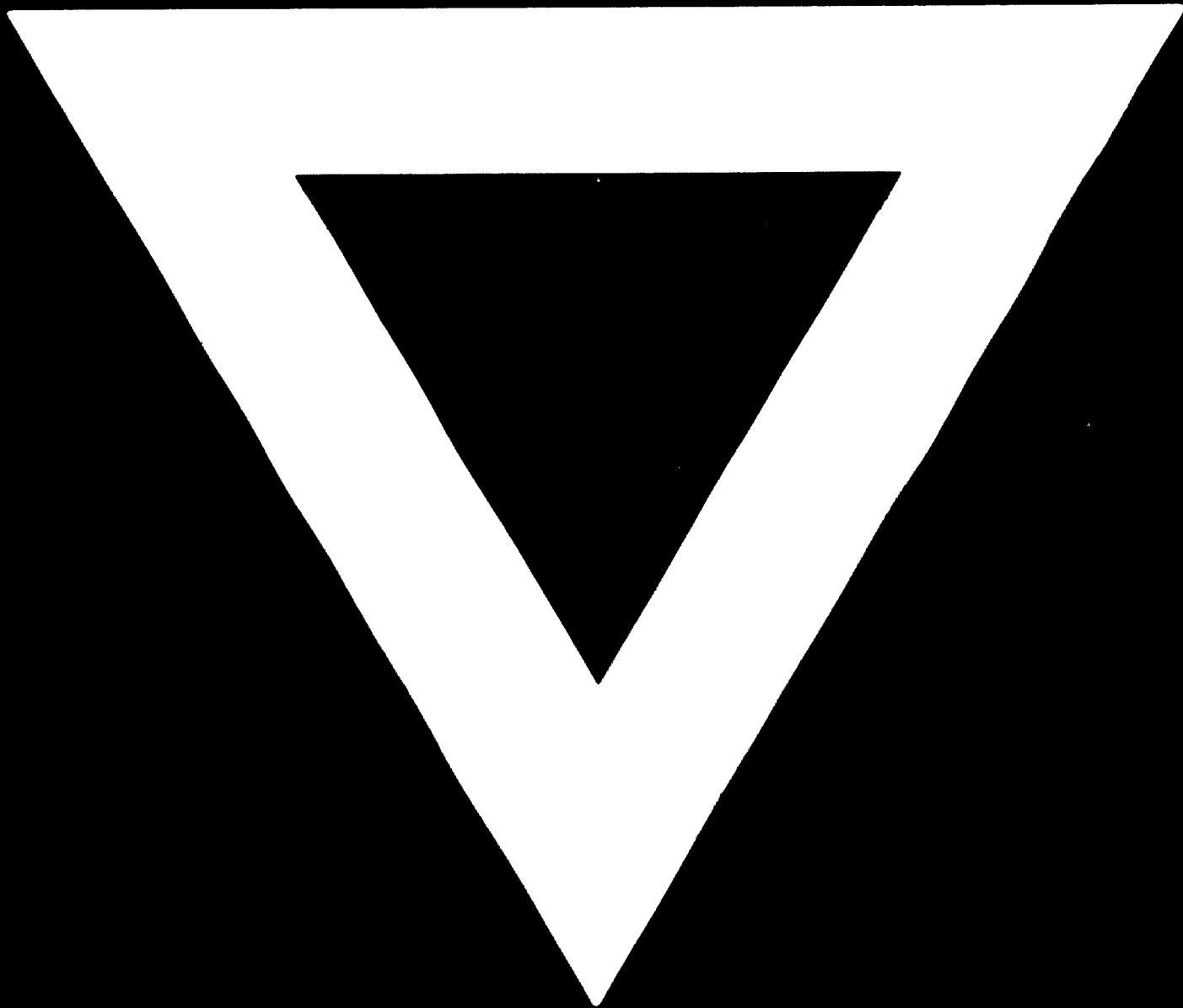


BLOCK SCHEM FOR THE SUBJECT AND FIELD OF ACTIVITY OF THE COMPUTER CENTER TO THE BULGARIAN SHIPBUILDING INDUSTRY



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