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PERSPECTIVE REPORT ON

# Electronics in India

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# Preface

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The Government of India constituted a Committee under the chairmanship of Dr. Homi J. Bhabha in 1963, to make an overall assessment of the requirements of electronic components and equipment in the country, to survey the existing and potential sources of supply and to recommend measures for the planned development of electronics so that the country could become self-sufficient in this field in the shortest possible time. The Report of the Bhabha Committee was submitted to Government in early 1966. The Report contained the following major recommendations:

- (i) Components form the crux of the electronics industry, and should be manufactured in the country as quickly as possible;
- (ii) in the field of general purpose components, manufacture in quantity is desirable both to secure the economies of scale of manufacture, as also to ensure that research and development facilities could be set up in the manufacturing units to keep them abreast of advances in technology which are extremely rapid in this very dynamic industry;
- (iii) equipment (as opposed to components), lends itself to manufacture on a smaller scale and the manufacture of equipment could, therefore, be organised in this manner;
- (iv) for immediate requirements, equipment will have to be mostly imported or assembled from imported components;
- (v) equipment required after about five years and later should be qualitatively identified and developed in the country with a view to production and issue to users at the appropriate time;
- (vi) in certain fields, foreign collaboration should be sought for immediate development; but, from the beginning, Indian scientists and engineers should engage themselves in further developing and elaborating the technologies acquired under licence or otherwise from abroad;
- (vii) in the field of components, etc., from the beginning, there should be standardisation with a view to manufacturing in quantity certain "preferred" types of components;
- (viii) about Rs. 1,000 crores worth of equipment would be required in the ten year period, from 1966 to 1975; ultimately, the value of annual production would be of the order of Rs. 300 crores; for establishing an industry of this size, a total of, approximately, Rs. 170 crores of investment would be needed over the ten year period.

Government accepted all the recommendations made by the Bhabha Committee. For advising Government in the implementation of the recommendations of the Bhabha Committee, an Electronics Committee was appointed under the chairmanship of Dr. V. A. Sarabhai in June 1966. This Committee was charged with the following responsibility:

"To take account of the most urgent needs for the rapid develop-

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ment of electronics, keep track of the research being done in design and development and give guidance and direction, where necessary, identify sectors where indigenous production could be built up, and promote the speedy building up of such capacity”.

In March 1970, a National Conference on Electronics was organised by the Government at Tata Institute of Fundamental Research in Bombay. It was attended by engineers, technologists, administrators and those in the management from Government, public and private sector industry, laboratories, research and development establishments, etc. A wide variety of subjects were discussed at this conference. Views expressed in the conference indicated that though the electronics industry had progressed satisfactorily in several areas in the previous three to four years, there were other areas in which progress was much less than what was needed or had been envisaged in the Bhabha Committee Report. In the field of consumer electronics (largely for entertainment), and in certain other areas, production was higher than that envisaged by the Bhabha Committee. However, in the field of defence and telecommunication equipment, there appeared to be need for achieving a much greater amount of self-sufficiency and self-reliance.

Recognising the importance of developing an integrated and self-reliant electronics industry in the country, and the need for rapid progress in this regard, Government constituted a separate Department of Electronics with effect from June 26, 1970. In February 1971, the Government constituted the Electronics Commission.

In the resolution setting up the Electronics Commission, it is stated: “Government attaches the highest importance to the development of an integrated and self-reliant electronics industry in the country, as rapidly as possible. Electronics occupies a key position in modern science and technology. It has a vital role to play in the fields of atomic energy, communications, defence, education, entertainment and space technology. It is assuming increasing importance in the monitoring and control of production processes in the engineering, chemical and metallurgical industries. Because of its dynamic character, its pervasive nature and its significant impact on science, industry and society, electronics is today in the vanguard of technological progress. Technological progress and obsolescence are both very rapid in this field. An intensive promotional effort relating to both production, and research and development is, therefore, essential to ensure a rapid growth of self-confidence and of indigenous capabilities”.

The Electronics Commission has been charged with full responsibility to review the entire field of electronics with regard to research, development and industrial operations, with full authority to formulate policy in this field and to direct implementation, on sound technical and economic principles, of all measures both promotional and regulatory that are necessary for the country to attain self-reliance in the shortest possible time and in the best possible manner.

The Bhabha Committee Report was the first detailed analysis in the Indian context, of a sophisticated and fast changing areas of science, technology and industry. The Report had looked into questions relating to materials, components, equipment and systems; it had also covered problems relating to investment, production, employment and know-how. At the time

the Electronics Commission was set up in February 1971, this was the only detailed analysis available to plan for the growth of the electronics industry. It was, however, recognised by the Electronics Commission that the Bhabha Committee Report was prepared during the years 1963-65. The rate of change in the field of electronics was so significant that major areas, where revolutionary developments had taken place by 1971, such as solid state electronics and computers, had been dealt with in a rather tentative and preliminary way in the Bhabha Committee Report. At the National Conference on Electronics held in 1970, it had also been brought out that many of the numbers given in the Bhabha Committee Report needed reconsideration from the view point of being accepted as realistic figures for production and purchase, based on approved financial provisions. It was, therefore, recognised that whilst the Bhabha Committee Report could be accepted as an initial document for starting on the work assigned to the Electronics Commission, there would have to be significant re-analyses from the view point of planning for the electronics industry during the 1970s and 1980s.

Recognising the importance of accurate and timely information, for macro- and micro-level planning, and for critical, in-depth techno-economic analyses, the Electronics Commission decided to set up an Information, Planning and Analysis Group (IPAG), with the mandate to provide information required by the Electronics Commission for its decision making, as well as to disseminate information to laboratories, industries, entrepreneurs and all concerned with the growth of the electronics industry. Over the past four years, under instructions from the Electronics Commission, IPAG has set up a large number of expert technical panels to examine, in depth, various specified fields of electronics. These panels were composed of experts from Government, industry, academic institutions, research and development laboratories, etc. They were asked to assess the current status of the particular field in terms of investment, licensed and installed capacity, production, technology, cost of production, exports, etc., and to provide forecasts concerning all of these matters over the Fifth Plan period (1974-79) and in perspective into the Sixth Plan period (1979-84). Staff members of IPAG have also carried out in-depth analyses of specific aspects. A regular monthly journal, "Electronics—Information & Planning" has been under publication since October 1973 in which the IPAG Analysis Reports and the reports of the various Expert Panels in summary form are published.

Apart from the above, a consolidated report on Telecommunication and Electronics Industry was prepared during 1972-73 and submitted to the Planning Commission. This report was prepared by a Task Force set up by the Planning Commission, at the instance of the Steering Group on Engineering Industries which was self concerned with the broad area of formulating policies and programmes relating to the development of engineering industries during the Fifth Plan period. The Task Force on Telecommunication and Electronics Industry worked through eight Working Groups in the following areas:

- (a) Consumer electronics
- (b) Mass communication
- (c) Telecommunications
- (d) Aerospace electronics & communication
- (e) Radar and defence systems
- (f) Computers, controls and industrial electronics

(g) Instruments and instrumentation

(h) Components and materials.

IPAG provided the analytical and secretarial support for these Working Groups, and was responsible for the final preparation of the Task Force Report. This Report formed the basis for discussions between the Department of Electronics, Planning Commission and Ministry of Finance concerning the Fifth Five Year Plan for Telecommunication and Electronics. On account of restraints on resources, the final plan allocations were different from the figures recommended by the Task Force.

The Estimates Committee of Parliament which examined the Department of Electronics during 1973-74 had strongly recommended that a consolidated document should be brought out concerning the current status of this field in the country and plans covering the Fifth and Sixth Plan periods. The Informal Consultative Committee of Parliament for the Department of Electronics had also emphasised the need for this. IPAG was entrusted with this task and has produced a document by integrating the reports submitted by various technical panels, the analysis reports prepared by various IPAG staff members and the Report of the Task Force on Telecommunication and Electronics Industry submitted to the Planning Commission. After integrating all of this material, the relevant parts were submitted for comments to concerned Ministries and Departments in the Government of India and to a wide spectrum of knowledgeable persons in the electronics community of the country. After taking into account all the comments received, IPAG has finally produced this document entitled "Perspective Report on Electronics in India".

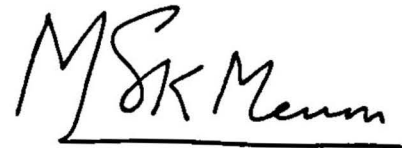
It is essential to point out certain basic features inherent in any such document. The figures given in this report are the best available at present, but they must be regarded as only indicative figures and subject to changes. In this connection, one has only to recall that, in the case of the Bhabha Committee Report, it was felt at the National Conference on Electronics held in 1970 that the numbers indicated in many areas were those one would have liked to hope for, but which could not be implemented in the absence of financial provisions for purchase by the end user or for investment to produce these. We have also to bear in mind the fact that we are at present in a highly complex and unstable economic situation involving inflationary pressures within the country and highly competitive demands on the economy from many priority sectors; with inflationary and recessionary tendencies abroad with a continually increasing pricing for energy and many raw-materials, industrial products and know-how; with fluctuations caused by situations outside the control of individual countries or governments, such as natural calamities, effects of hostilities at various locations in the world, etc. All these factors tend to ultimately affect national priorities, investments available, buying power of individual consumers as well as that of the Government as a whole for public purposes, etc. Electronics is an area which couples intimately with defence, atomic energy and space programmes, telecommunications, mass communications and the large consumer areas of entertainment. It is therefore, very sensitive to changes of priorities in these various sectors.

In spite of all this, it is still felt that it is important to have a consolidated document in which effort that has gone into the extensive collection of information and vast amount of analytical work done over the past four

years, could be brought together at one place. This is the essential purpose of this Report.

It must also be emphasised that this is not a document which lays down government policies over the entire field of electronics. The Fifth Five Year Plan for Telecommunication and Electronics accepted by the Planning Commission and Ministry of Finance, figures as a basic element in this Report. But Government policies relate not only to the Plan in its bare essentials, but also to other aspects such as availability of foreign exchange, policies towards large houses or foreign collaboration, export policies, etc. It is obvious that Government policies and decisions relating to a fast changing industry like electronics, cannot be decided for the entire field in one go. These decisions are taken with respect to individual elements of this vast field, in consultation with all other Government bodies concerned with the different facets of that one element, but in taking these decisions Government is no doubt guided by the totality of the picture of the field of electronics and its applications as covered in this Report. And that is the value of such a report apart from its intrinsic merits.

The Electronics Commission is grateful to Dr. N. Seshagiri, Director, IPAG and his colleagues who have put in considerable effort to produce this Report; as also to the officers of the Department of Electronics and the many technical experts and others connected with the electronics industry who have given of their time and energy in participating in various panels, committees and meetings to arrive at optimal national solutions in this area.



M. G. K. MENON



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